CE

Automotive Air-Conditioning Service Equipment

Ariazone 901

OPERATOR MANUAL

Contents

Page

1. Introduction

This Automotive A/C Service Station (Recovery, Recycling, Evacuation and Charging System) is a user-friendly tool specifically designed for the automotive air-conditioning technicians, to carry out the following functions:

- Testing air conditioning system
- Recover and recycle refrigerant.
- Gauge amount of refrigerant recovered from air-conditioning system.
- Gauge amount of oil removed from air-conditioning system (if any).
- Evacuate air-conditioning system.
- Charge lubrication oil or UV dye by volume into air-conditioning system.
- Electronically charge refrigerant by weight.

The system provides electronically controlled functions, whilst keeping the operator constantly informed and in full control.

This unit has been designed and build to be long lasting and with high level of reliability including maximum safety for the operator. The operator needs only to be responsible for the proper use and maintenance of the unit, in accordance with the manufacturer instructions found in this manual.

Important: This manual contains important information pertinent to operator safety, and must accompany the unit, in the case of sale or transfer to another party.

Manufacturer reserves the right to modify this manual and the unit itself at any time without prior notice.

Environmental information

This product may contain substances that can be hazardous to the environmental or to human health if it's not disposed of properly.

Electrical and electronic equipments should never be disposed of in the usual municipal waste, but must be separately collected for their proper treatment (recycling).

We also recommend that you adopt appropriate measures for environmental protection: recycling of the internal and external packaging of the product, including batteries (if any).

With your help it is possible to protect our planet and improve the quality of life, by preventing potentially hazardous substances being released in to our environment.

2. Important Safety Information's

This unit is extremely simple and reliable in selecting and performing all its functions. Therefore, the user is not exposed to any risk, if the general safety guidelines reported below are followed, in association with proper use and maintenance of the unit (improper use and maintenance will reduce the safety of the unit).

- This equipment is to be operated by accredited technician only! Users must have basic knowledge of air-conditioning and refrigeration systems, including potential hazards associated with the handling of refrigerants and systems under high pressure.

- Use only pure R134a refrigerant with this equipment.

Read this user manual carefully before operating the unit. If you do not understand any section of this manual, please contact your nearest distributor or manufacturer.

Handle refrigerant with care as serious injury may occur. Always **wear appropriate protective safety gloves**.

The contact with refrigerant can cause blindness. Always **wear appropriate protective safety glasses**.

- RISK OF ELECTRICAL SHOCK. Power lead plug to be connected **only to power point with an earth**.

- Never operate the equipment with a damaged power lead, replace it immediately.

- Before removing any protective cover from unit, always **unplug power lead from power point**.

- The power cable may only be connected to a socket with nominal voltage stated on the rating plate, located at the rear of the unit.

- **Avoid inhalation of the refrigerant**. Use only in well ventilated work areas.

- Do not expose the machine to direct artificial heat or rain.

- Do not tamper with or change safety control devices or their settings.

- When transporting the unit keep upright and remove refrigerant cylinder from platform.

- Do not cover ventilation openings when the unit is operating.

- Maintenance is to be carried out as per the manufacturer recommendation shown in this manual. Only original parts are to be used for maintenance and repairs. Maintenance of the unit must only be performed by an authorized technician.

- Only non aggressive substances to be used for cleaning of the unit.

- The unit should not be operated with flammable refrigerants.

3. Technical Specifications

Refrigerant ..... **R134 a**

Electronic refrigerant scale ..... **+/- 10 g resolution**

Load cell ..... **60kg with 150% overload capacity**

LP and HP gauges ..... **AI-D 68 mm kl.1.0**

Recovery pump ..... **Danfoss TL5G, hermetic**

Recovery rate ..... **220 g/min (liquid state)**

Vacuum pump ..... **50 l/min (1.5 cfm)**

Dimensions ..... **43.5cm x 40cm x 45cm (height)**

Weight ..... **34kg (without hoses and cylinder)**

Chassis ..... **Sturdy all steel construction, powder coated.**

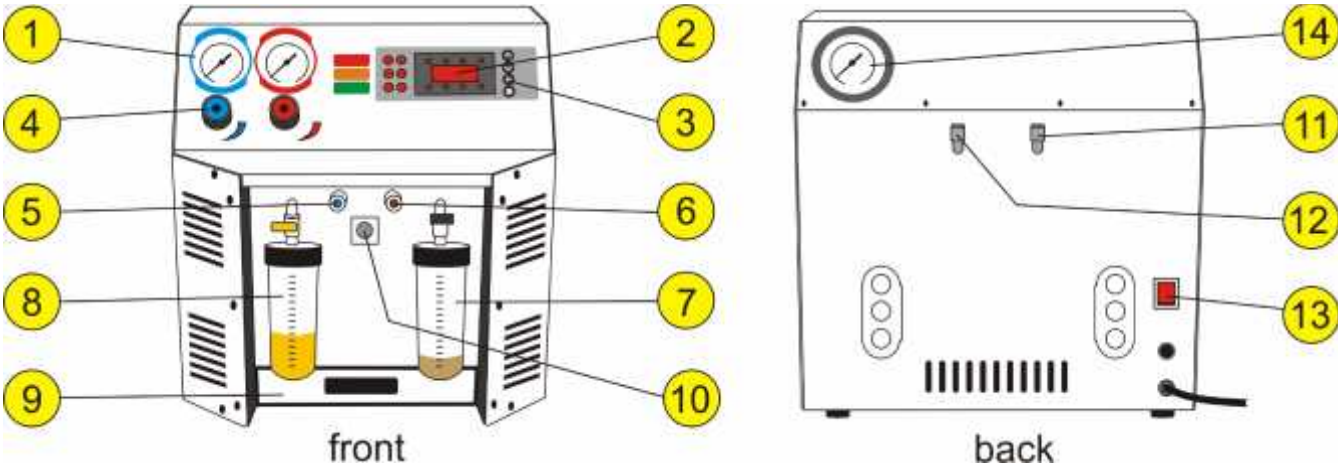
Supply voltage ..... **220-240VAC / 50-60Hz**

Power ..... **500 W**

Noise level .....**< 70 dB (A)**

Working conditions ..... **0 – 45 ^{o}C ambient temperature, up to 80% humidity, 2000m altitude**

4. Main Parts & Features



1. Analog Gauges - Two large analogue gauges display suction and discharge pressures, which are mounted on the front panel for easy viewing by the operator. Pressures are displayed in Bar & PSI and temperatures in degrees Celsius.

2. Display - Numerical display indicates the values and LED indicators above and below the numeric display inform the operator whether the display is indicating kg or lb, remaining vacuum time, weight of refrigerant currently within the cylinder, the amount of refrigerant being charged or the amount of refrigerant recovered.

3. Mode Indicator - LED group and membrane switches. Three pairs of led blocks indicate the mode and status of the unit. These are used in conjunction with the adjacent membrane switches to select the unit functions. Further, once the mode is in operation the pattern in which the led's flash, indicate the activity of the system. These can be viewed from several meters.

4. Hand Valves - The console hand valves allow the operator to control the flow of the refrigerant (if desired).

5. Suction (Blue) Service Hose Connecting Port – ¼" SAE.

6. Discharge (Red) Service Hose Connecting Port – ¼" SAE.

7. Recovered Oil Drain Reservoir - A vessel of 250ml (8.75oz) is mounted on the right front of the unit to allow the operator to gauge the amount of oil recovered from the air conditioning system, if any.

8. New Oil (and/or UV Dye) Storage Reservoir - A vessel of 250ml (8.75oz) is mounted on the left front of the unit to allow the operator to inject oil into air conditioning system automatically.

9. Cylinder Platform / Electronic Scale

10. Five pin connector for Electronic scale

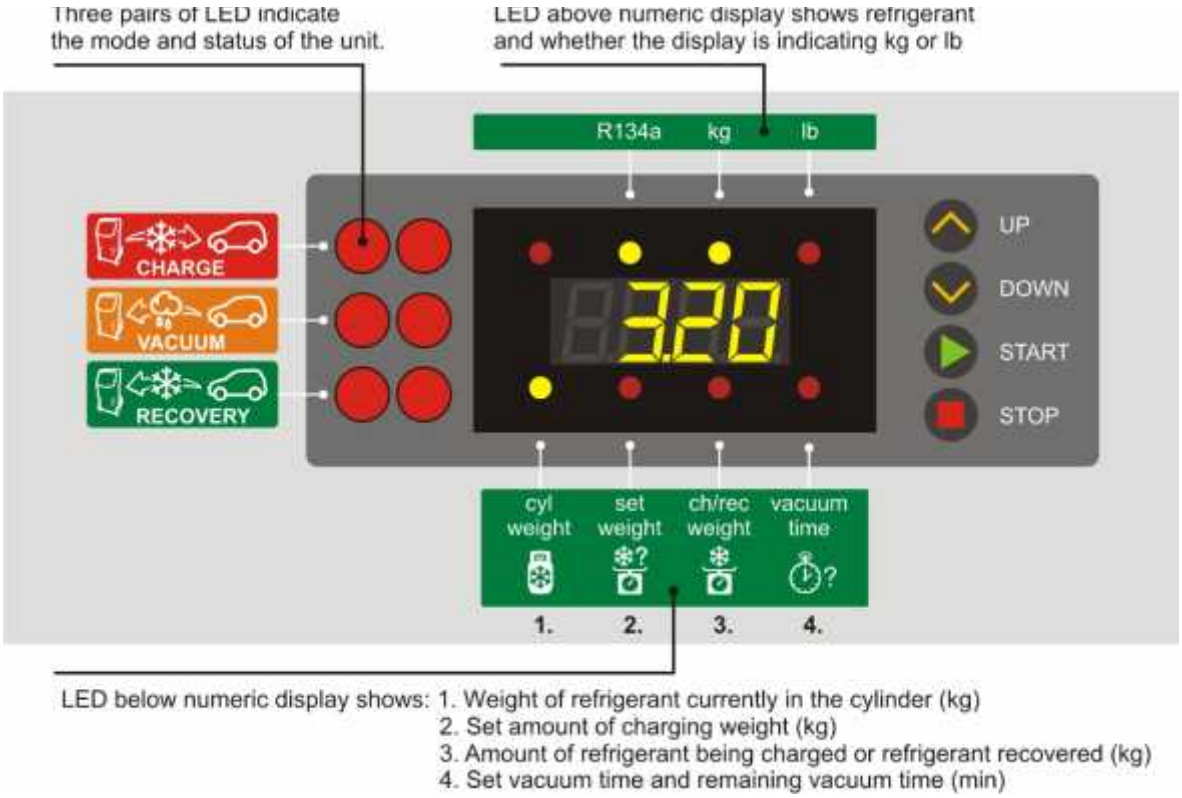
11. Cylinder vapor hose

12. Cylinder liquid hose

13. Power (switch, fuse, power lead)

14. Cylinder gauge

5. Display descriptions



Other display descriptions:

FILT XXHr - Displays filter life in number of hours after machine is switched on

O Hr – Service alarm for maintenance and filter replacement.

PAUS - Recovery pause is running, for duration of two minutes.

bUSY – Recovered (old) oil drain into plactic vessel (9)

dOnE - The selected function is completed

nO rEF - No refrigerant pressure in service hoses, or console hand valves are not open

HIgH PrES - Excess pressure in refrigerant cylinder (12)

CYL FULL - Refrigerant weight exceeds maximum allowable limit and will not recover any more refrigerant

TArE - Calibrating the weight display to read -0.00 with an empty cylinder on platform.

SPAn - Calibrating of the refrigerant electronic scale

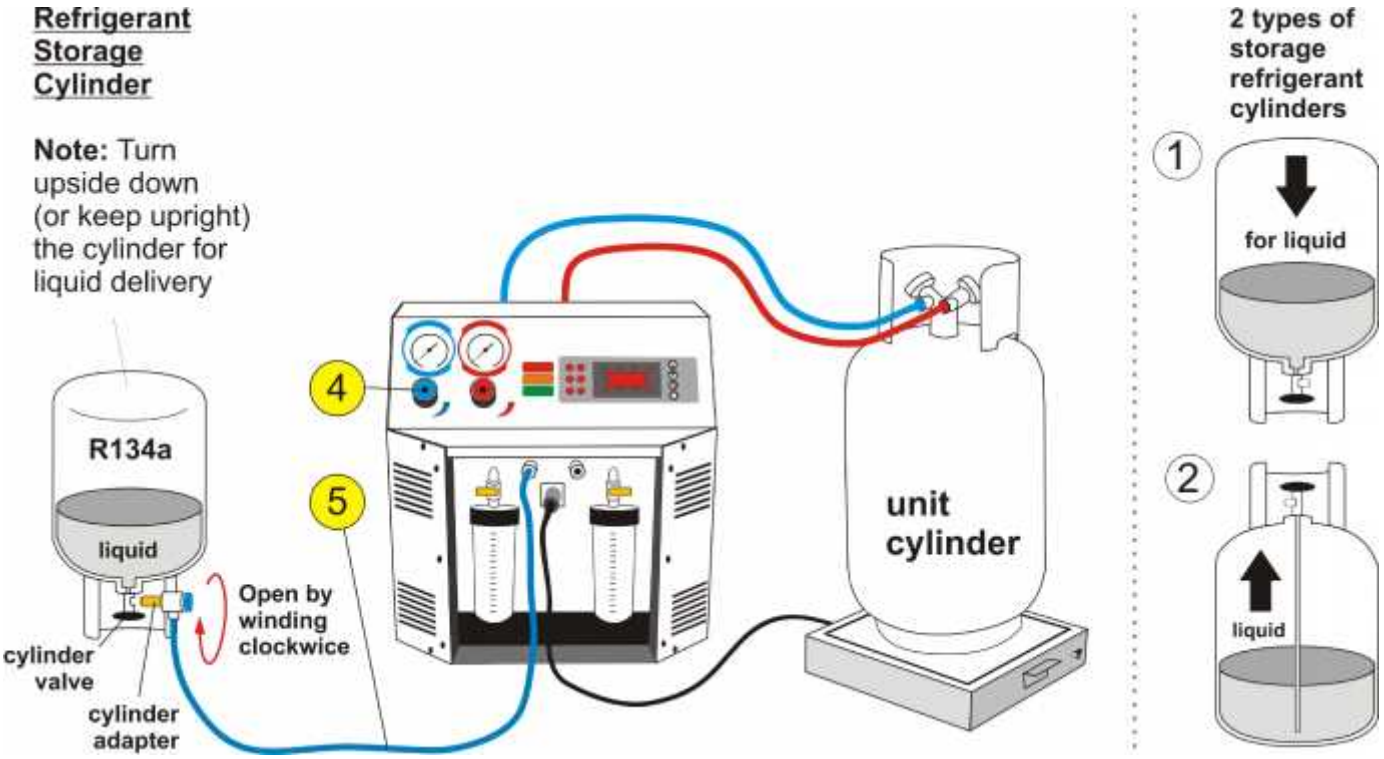
CYL - This display allows the operator to set the maximum allowable refrigerant weight in cylinder.

Err1 - Disconnected load cell lead or faulty load-cell.
selected also.

6. Refrigerant Cylinder Filling Procedure

The cylinder may be filled with refrigerant by following procedure.

Connect the suction (blue) service hose (5) to storage cylinder **liquid valve** by using the refrigerant cylinder adapter, open **liquid valve** on storage cylinder, open service hose quick coupling and console blue hand valve (4) ...



... With "UP" keys select the ***Recovery*** function. By pressing "START" key twice, the unit will automatically start transferring the refrigerant from the storage cylinder to the unit cylinder.

When the desired amount of refrigerant is transferred, close the storage cylinder valve and allow the unit to recover the refrigerant from the service hose. Once the function is completed the unit will display symbol "done" and the amount of refrigerant transferred will be displayed in kg or lb on main display (2).

The cylinder may be taken to your refrigerant supplier and refilled. We recommend that the cylinder is not filled to it's maximum capacity or the unit will not allow you to recover, due to the safety features incorporated.

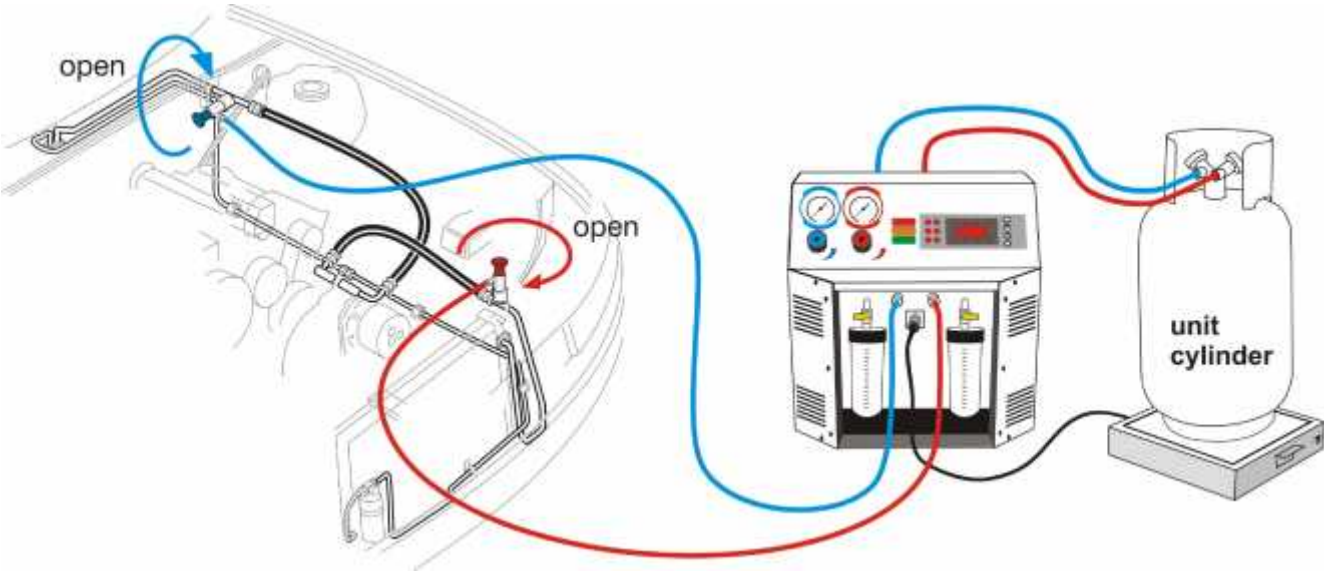
WARNING:
- Do not allow the cylinder to be filled above 80% of it's capacity.
- Never transport an overfilled cylinder. Refrigerant expands when heated and may cause the pressure relief valve to open and exhaust refrigerant in to the atmosphere or the cylinder may rupture.

7. Connecting to the Automotive A/C System

Use the service hose quick couplings to connect the hoses to the A/C system service ports, bearing in mind that BLUE must be connected to the low-pressure (suction) side and RED to high pressure (discharge).

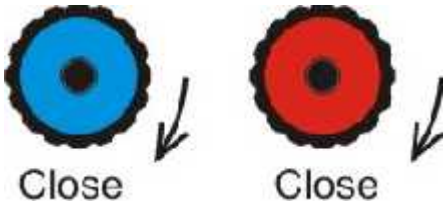
If the system is equipped with a single service port, connect only the appropriate hose.

Note: Before connecting the quick couplers, clean the a/c ports of any foreign material.



Winding the quick coupler hand wheel clockwise will allow the refrigerant to flow through the hoses. Turning hand wheel in opposite direction, the flow will be closed. If there is any refrigerant in the air-conditioning system, the pressure gauges will indicate a pressure rise.

Note: Console hand valves (4) need to stay closed in order not to allow the refrigerant to enter the service equipment until the required function has been selected.



The unit gauges (suction & discharge) are important and useful instruments. The operator should have basic understanding between gauge reading and air-conditioning system operation in order to correctly diagnose any possible system malfunction.

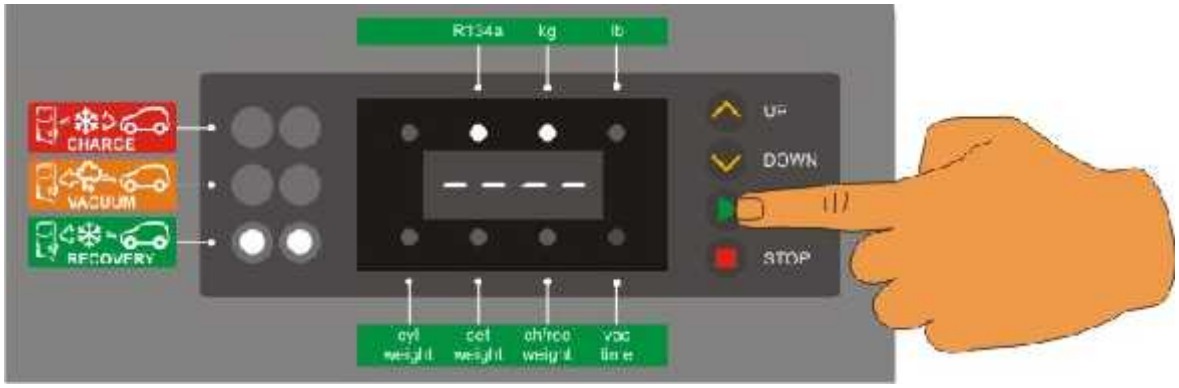
Set the transmission in neutral, start engine and turn the air conditioning on. Allow pressure gauge needles to stabilize and record the pressure readings.

Gauges reading may show particular problem or associate to a possible problems.

8. Recovery & Recycling Mode

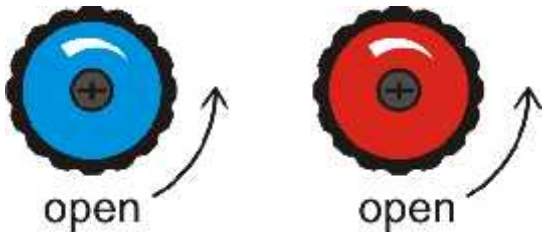
The purpose of the Recovery & Recycling mode is to recover refrigerant from the air conditioning system, which will condense, purify and store the liquid refrigerant in the unit cylinder ready for re-use.

To initiate the Recovery mode, press the 'UP' key once, followed by 'START' on the console. Display shows (- - - -). Now, there are two choices:



1. Press "START" key again to recover the **whole amount** of the refrigerant from the A/C system or storage cylinder.

2. With "UP" or "DOWN" key to select **desired** quantity of refrigerant to be recovered from the a/c system or storage cylinder. After the quantity selection, press "START" key.



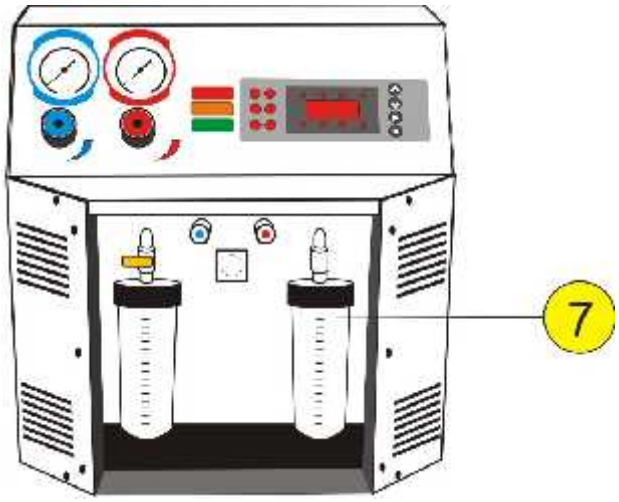
Note: Open the hand valves (4) on the console to allow the flow of the refrigerant from the a/c system into the unit before making the above selection.

During the recovery process, the Recovery mode indicator will now be ON and the display (2) will indicate the amount of refrigerant being recovered.

In normal operation the above condition will be maintained until a vacuum of -0.4 bar (15 In Hg) is reached at either the discharge or suction ports. When this occurs, the machine will beep once, and the unit will enter the recovery "PAUSE" mode. In this mode, the unit will shut down the recovery function and pause for 3 min., which during this time the recovery mode indicator will be ON constantly. The display (2) will indicate "PAUSE". During this function, the unit is monitoring whether the air-conditioning system pressure is increasing, due to any refrigerant that may be left in the accumulator or dryer. If the pressure increases above zero, the machine will re-start the recovery function automatically and recover the rest of the remaining refrigerant.

If at the end of Recovery process a sufficient vacuum has been maintained, the unit will stop, the display (2) will indicate 'done' and the amount of refrigerant recovered will be displayed in (kg or lb) depending on the operator's selection.

Press 'STOP' on the console, the unit will display "busy" for 7 seconds. During "busy" time machine will automatically drain recovered oil (separated from refrigerant) into recovered oil vessel (7).



Conditions that will halt the recovery mode

1. **Refrigerant cylinder (12) full.** To protect the storage cylinder (12) being overfilled, the unit will not allow the operator to recover refrigerant once it has reached 80% of its capacity.

2. **Air conditioning system empty.** If the A/C system pressure is not above atmospheric pressure, the recovery function will not be activated.

3. **High Pressure.** If the operating pressure of the unit exceeds 25 bar (340 psi), the unit will stop and display '**HigH - PrES'**. The following can cause the above:

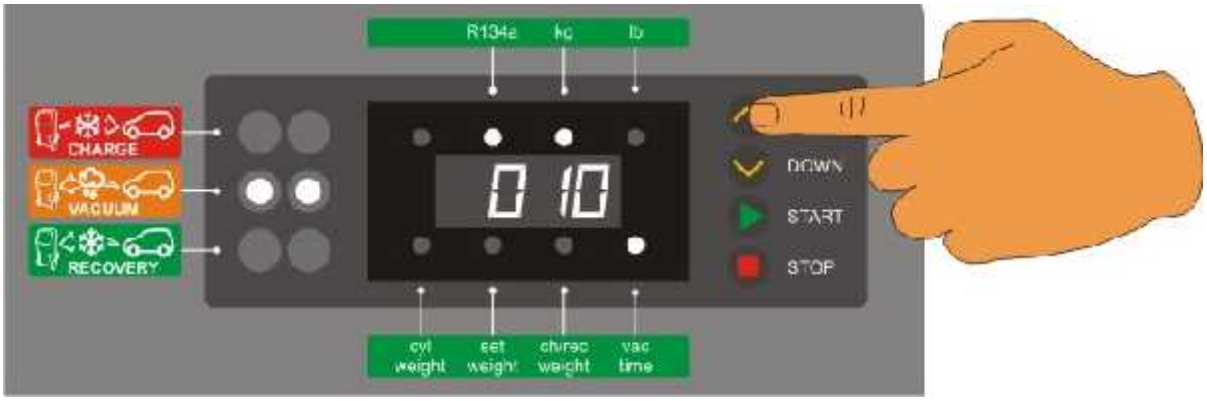
- Cylinder valves not open.
- Restricted cylinder hose. Check the ball valves.
- Excessive high ambience temperatures.
- Excessive air in refrigerant into the cylinder.
- Faulty pressure control.

In all the above circumstances, press the 'STOP' key to return to the machines initial mode.

9. Evacuation Mode

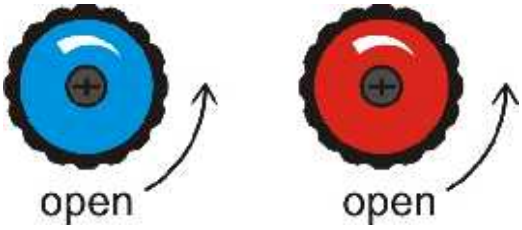
In the evacuation mode the air and moisture in the air conditioning system is removed and exhausted to the atmosphere. The evacuation mode runs for a predetermined time selected by the operator.

To initiate evacuation mode, press the 'UP' key twice, followed by the 'START' key. Select the desired evacuation duration by pressing the 'UP' key to increase or 'DOWN' key to decrease time duration.



(example value only)

Once the desired time has been selected press the 'START' key and the function will commence.



Note: During evacuation mode hand valves (4) on the console must be open.

The evacuation time can be set from one minute to eight hours.

At any time the evacuation time can be paused or cancelled by pressing the stop button once to pause, or twice to cancel the function.

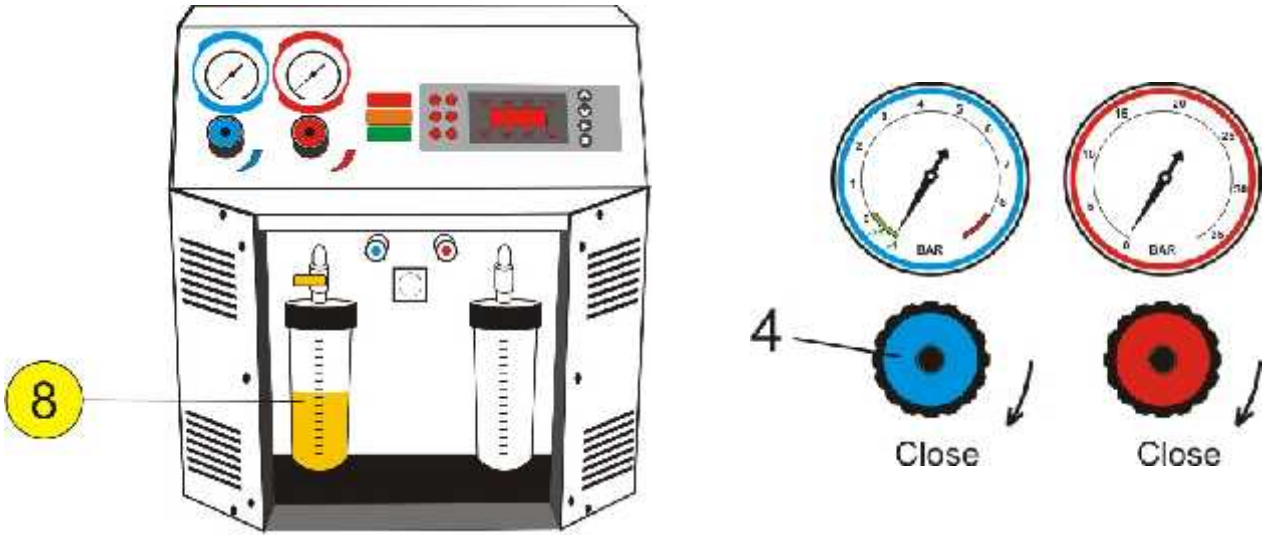
The unit has a unique function that if the evacuation function is selected and there is residual refrigerant in the air conditioning system, greater then 0.5 bar or 9 psi, the unit would detect this condition, whereby it will beep six times to warn the operator. After this warning the unit will automatically recover the residual refrigerant once it has recovered the entire refrigerant it will start the selected evacuation function automatically.

Note: After the evacuation process is completed, close both hand valves on console (4). By closing the valves the unit is "isolated" from the A/C system to allow for monitoring of any possible vacuum leak that may exist in the air- conditioning system. This is achieved by monitoring the suction and discharge gauges.

10. New Oil or UV Injection Mode

The purpose of the oil injection mode is to batch a user-defined quantity of refrigerant oil from the graduate reservoirs on the unit to the vehicle air-conditioning system.

Important: The unit requires that the air conditioning system has previously been evacuated to a maximum vacuum before this function can be carried out. Make sure you have sufficient oil in the oil reservoir (8).



Keep hand valves (4) closed on the console. Open the ball valve on the oil reservoir (8) and note the amount of oil being injected, by the graduations on the reservoir. Close the ball valve when the correct amount has been injected.

Warning: **If the oil reservoir (8) valve is not closed, excessive oil will be charged into the air conditioning system, or the oil will be blown out of the reservoir when charging a system.**

Note: Refrigerant oil (or UV dye) is injected in a/c system directly from Oil Container (8) through DISCHARGE (RED) service hose ONLY, in the line after the compressor.

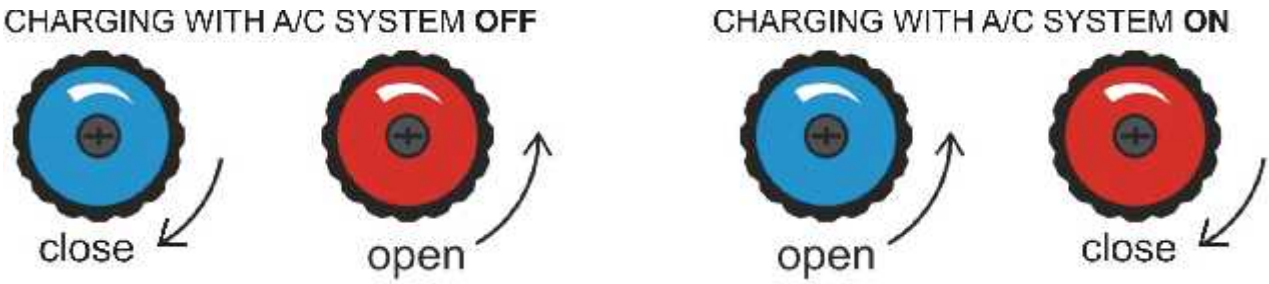
11. Refrigerant Charge Mode

The purpose of the refrigerant charge mode is to batch a user-defined weight of refrigerant into the air-conditioning system.

To initiate charging mode, press the 'UP' key three times (or DOWN once), followed by the 'START' key. Select the desired refrigerant amount by pressing the 'UP' key to increase or 'DOWN' key to decrease. The maximum refrigerant weight that can be set at this point is determined by the actual refrigerant weight available in the unit cylinder.

(example value only)

Once the refrigerant charge weight has been set, press the 'START' key and open appropriate hand valve depending on weather you are charging with the engine running or stationary (if the A/C system is OFF or ON).



The display (2) will start from zero and will indicate the amount of refrigerant that has been charged into the air-conditioning system. This function can be paused at any time, by pressing the 'STOP' key once, or twice, to cancel the function.

If the charge function has been paused, the amount of refrigerant that has been charged to that point will be displayed, to continue the charge function press the 'START' key.

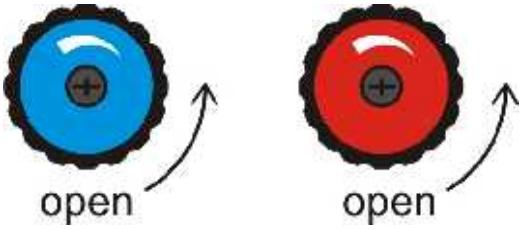
Once the present refrigerant weight has been charged, the charge function will automatically stop and the display will indicate 'DONE'. The operator can return the machine to its initial state by pressing 'STOP' key on the console.

Conditions that will prevent refrigerant charging:

- If there is little or no refrigerant in cylinder.
- If the cylinder valve is closed.
- If the hand manifold valve (4) console is closed.
- If the A/C system service port Schrader valve is not depressed.

12. Automatic Cycle Mode

In the Automatic cycle mode, all the operations (Refrigerant Recovering and Recycling, Recovered Oil Drain, Evacuation and Refrigerant Charging) are performed automatically one after the other in ONE CYCLE.



Note: During AUTOMATIC mode hand valves (4) on the console must be open.

To initiate the Automatic cycle mode, press the “UP” or ’DOWN’ key 4 times (display will show AUTO) followed by ’START’ key.

Set the vaccum time duration by pressing the ’UP’ key to increase or ’DOWN’ key to decrease. Once the desired vacuum time has been selected, press ’START’ key.

(example value only)

Set the amount of refrigerant to be charged into the a/c system (with **'UP'** key to increase or **'DOWN'** key to decrease the quantity. Press 'START' key to start automatic mode.

(example value only)

The unit will perform all tasks (refrigerant recovering, recovered oil drain, evacuation and refrigerant charging) in one automatic cycle.

Note: After the recovery and evacuation proces finish, just before refrigerant charge, the unit will go in pause for 2 min (operator can set pause time from 0 – 10min). This is time where operator can manually (by opening the ball valves) add new oil (10) or/and UV dye (21) into a/c system (if needed).

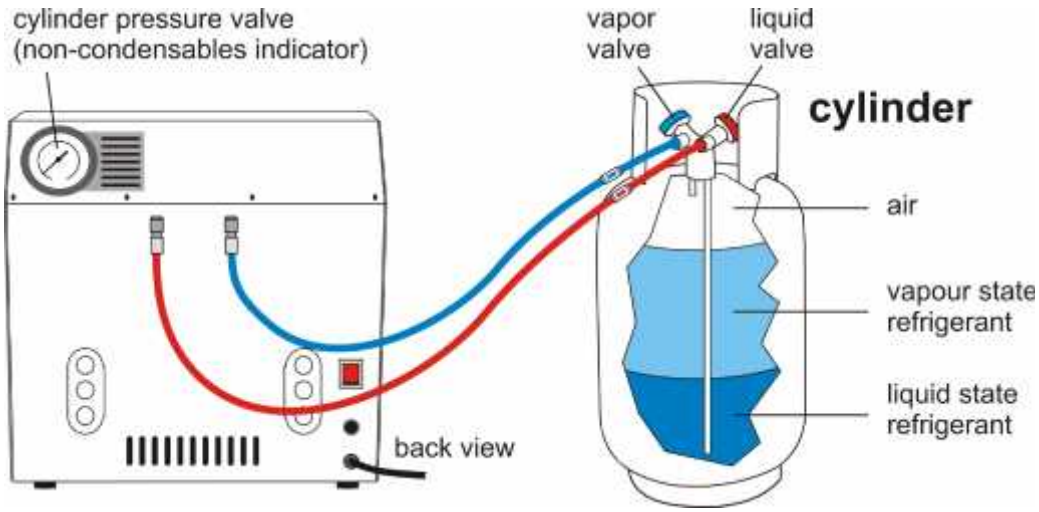
Conditions that will prevent refrigerant charging:

- If there is little or no refrigerant in cylinder.
- If the cylinder valve is closed.
- If the hand manifold valves (4) console are closed.
- If the A/C system service port Schrader valve is not depressed.
- Faulty pressure control.

13. Cylinder Air Purge

Air is not good for A/C system because it is a non-condensable gas. It is possible to get inside the cylinder during the proces of recovery of contaminated a/c system (system which leaks or not properly evacuated).

To check the cylinder for air contamination, a technician should read the pressure on the refrigerant in storage cylinder to see if it exceeds the maximum allowable pressure for a given ambient temperature. If it does, there is air in the cylinder and needs to be purged (through cylinder vapor valve).



First, measure the ambient temperature. Then read the cylinder pressure on rear gauge (13) and compare it with the temperature pressure chart, affixed to the machine.

If the cylinder pressure is higher than the pressure/temperature chart, there are non-condensable gases (air) in the cylinder.

- Disconnect the vapour hose from cylinder.
- Slightly OPEN cylinder vapour valve to purge the non-condensable gases (air) from the cylinder to bring back the pressure to the recommended chart values.

Note: After recovery process it is normal that cylinder pressure is higher than the pressure/temperature chart shows. Always read the cylinder pressure first thing in the morning before operating the machine.

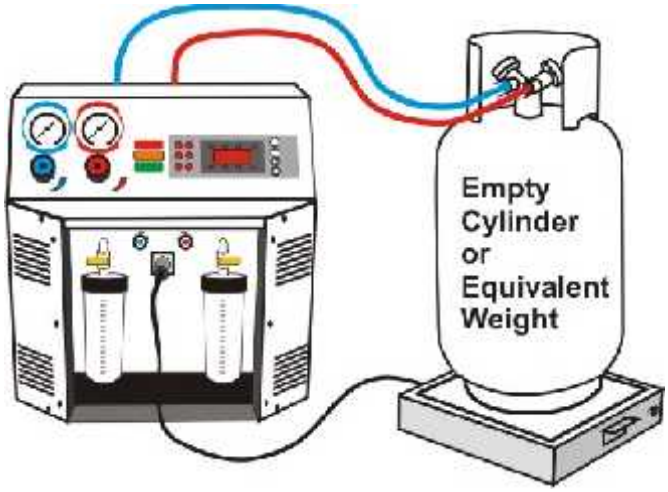
Example: Ambient temp. 20 ^{o}C, the cylinder pressure should be 4.7 bar (68 PSI).

Ambient temperature	***Air purge gauge readings***	
(C^{o})	**bar**	**PSI**
8	2.9	42
12	3.4	49
18	4.3	63
20	4.7	68
22	5.1	73
24	5.4	79
26	5.8	84
28	6.2	90
30	6.7	96
34	7.6	110
38	8.6	124
42	9.7	141
46	10.9	157

14. Unit Set Up

14.1 . Load Cell Calibration procedures

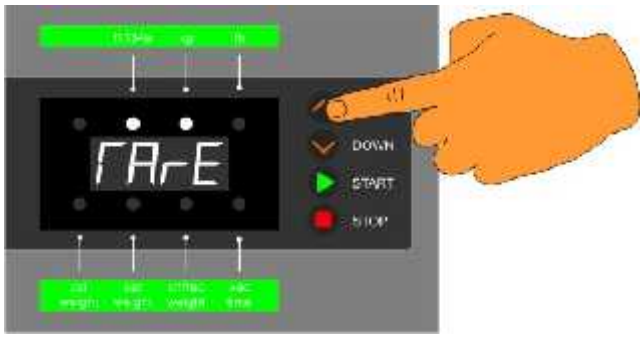
Step 1 – Tare *(Calibrating the zero weight display 0.00kg with the empty cylinder on platform)*



Place empty cylinder or similar weigh (as unit empty cylinder) on the cylinder platform.

Connect the cylinder hoses to the cylinder.

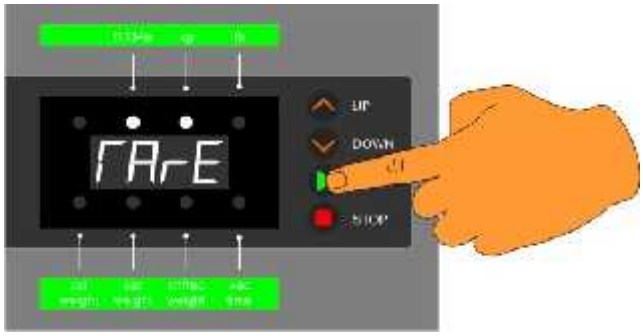
Check that cylinder and the platform are free (not touching the body of the machine) and the strap is properly secured.



Press and hold depressed the "UP" button and switch ON the unit (on the main power switch at back).

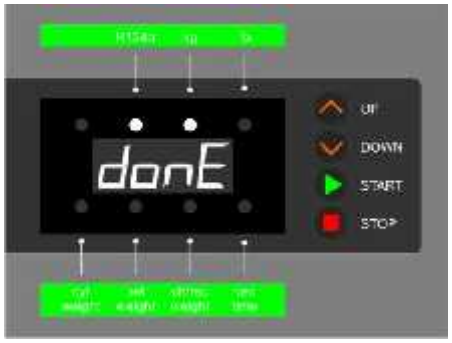
The display will indicate TARE.

Now, release 'UP' button.

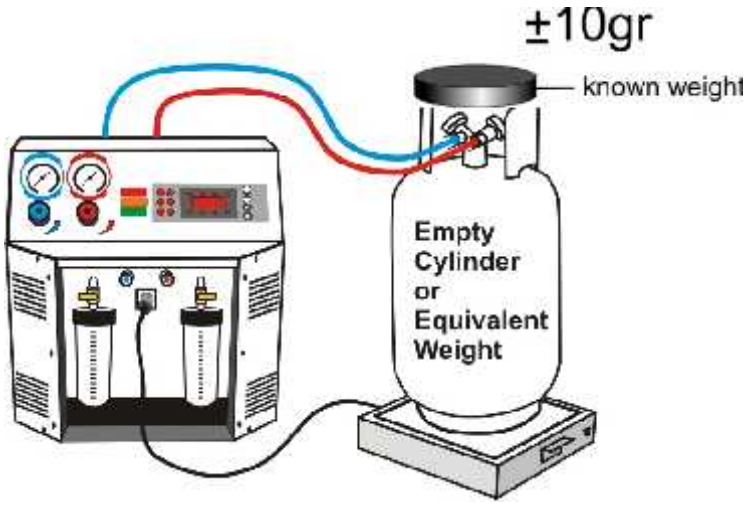


After BEEP sound, press 'START' button to confirm the TARE. The display will indicate "DONE".
Note: If "DONE" is not indicated, perform the function again.

The display will indicate 0.00kg which is the right weight because the cylinder is empty.

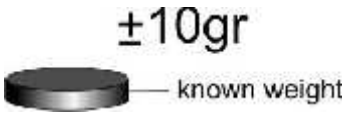


Step 2 - Span *(Calibrating weight precision)*

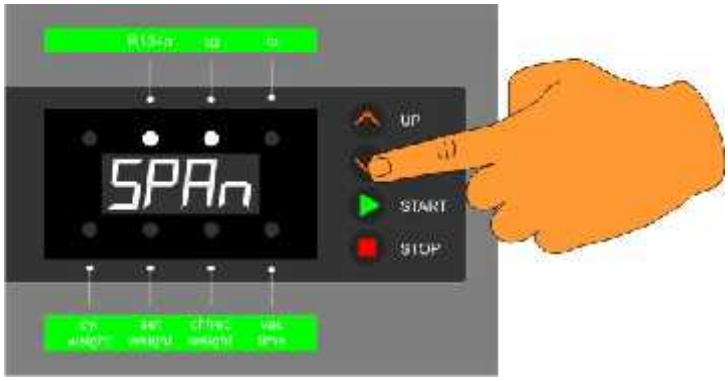


Place known weight on top of empty cylinder. Known weigh should be minimum 5kg. In our example, it is 20kg.

Operator should know the right amount (+-10gr) of the weigh he is using.

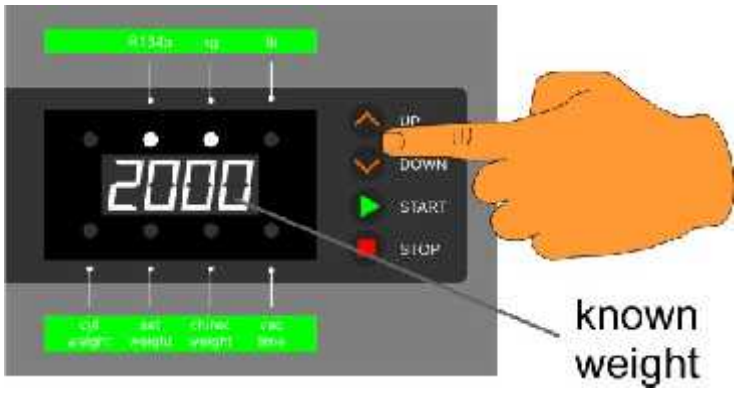


Make sure it is placed centrally on the cylinder and platform.



Press and hold depressed the "DOWN" button and switch ON the unit (on the main power switch at back).

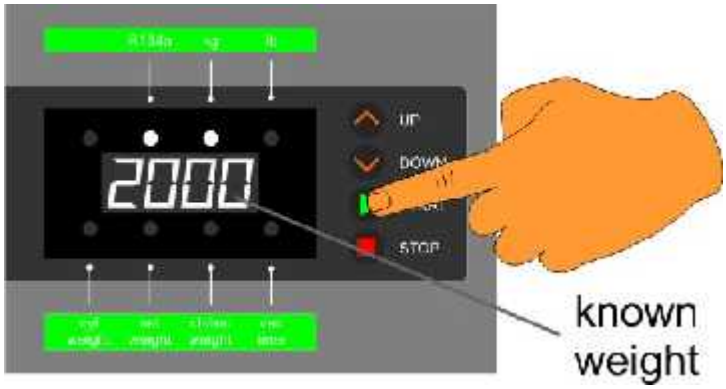
The display will indicate SPAN.



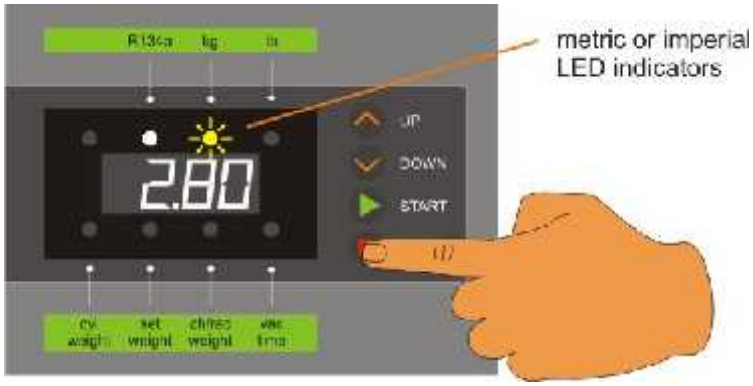
By pressing “UP” or “DOWN” buttons, set the amount of the known weight.

When display indicates the selected amount press “START” button to confirm the calibration.

Take off the weight on the top of the cylinder (without the weight machine should indicate arr. 0.00kg).

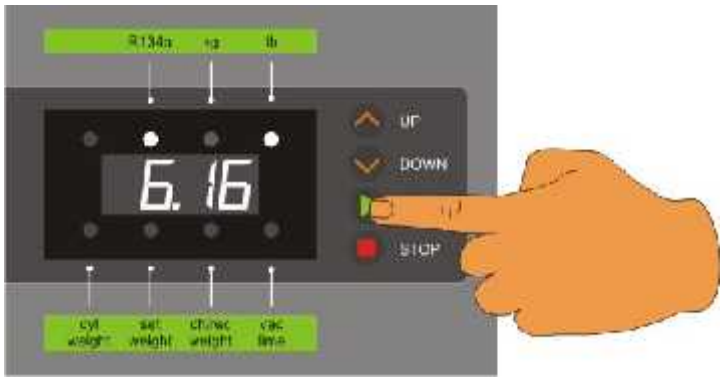


14.2. Set metric or Imperial system (Kg or Lb)



While machine in “stand by” press and keep depressed “STOP” button for few seconds until LED indicator start to flesh.

Press “DOWN” key to change from Kg to Lb (or opposite).



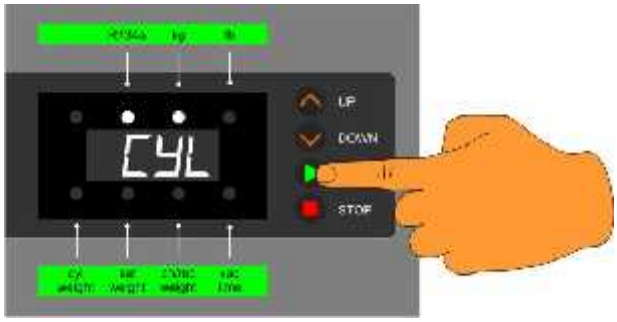
Press “START” key to confirm selected measurement unit.

14.3. Set up of maximum allowable refrigerant weight in cylinder)

It is recommended that the recovery cylinders are filled to 80% of their capacity. Maximum cylinder weigh set up function allows automatic protection to prevent the storage cylinder from being overfilled.

- Press and hold depressed the "START" button and switch ON the unit (on the main power switch at back).

The display will indicate CYL.

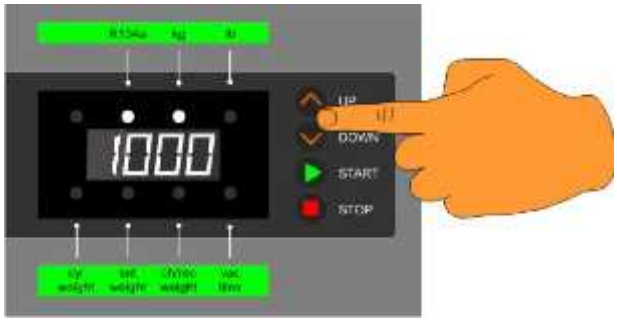


- By pressing “UP” or “DOWN” button, set the maximum weight to be 80% of the cylinder capacity.

For the 12kg cylinder set maximum 10kg.

For 25kg cylinder set max. 20kg.

For 27kg cylinder, set max 22kg…



- When display indicate the selected amount press “START” button to confirm the maximum cylinder set up.

14. Service Procedure

The following table describes the service intervals of the unit.

Every 100 Working Hours /Once a Year Service.
The service alarm will alert the operator for maintenance and filter replacement.

Service Kit 100Hr
- Vacuum pump Oil - 330ml,
- Recovery Line Filter Strainer,
- Main Filter Dryer,
- Service Hoses Rubber Gaskets

Interval	Component	Procedure
Every 100 Hr / Once a year	Main Filter Dryer	Replace
Every 100 Hr / Once a year	Primary Recovery Line Filter Strainer	Replace
Every 100 Hr / Once a year	Vacuum Pump Oil – 250ml	Drain and refill
Every 100 Hr / Once a year	Service hose Rubber Gaskets	Check / Replace
Every 100 Hr / Once a year	Gauges	Test calibration
Every 100 Hr / Once a year	Weight Platform	Test calibration

Every 300 Working Hours Service.
The unit requires 100 hour service plus replacing of oil separator, primary charging filter and recovery pump (compressor) oil.

Interval	Component	Procedure
300 Hours	Oil Separator	Replace
300 Hours	Primary Charging Line Filter Strainer	Replace
300 Hours	Recovery Pump Oil – 280ml	Drain and refill
300 Hours	Main Filter Dryer	Replace
300 Hours	Primary Recovery Line Filter Strainer	Replace
300 Hours	Vacuum Pump Oil - 250ml	Drain and refill
300 Hours	Service hose Rubber Gaskets	Check / Replace
300 Hours	Gauges	Test calibration
300 Hours	Weight Platform	Test calibration

Service Kit 300Hr
- Vacuum pump Oil - 330ml,
- Recovery Line Filter Strainer,
- Main Filter Dryer,
- Service Hoses Rubber Gaskets,
- Charging Line Filter strainer,
- Oil Separator,
- Recovery Pump Oil - 500ml

Manufacturer recommends a record of all services on the machine to be kept.

Notes:

Declaration of Conformity

The company: **Ariazone International Europe**
15-ti Korpus bb.,
6000 Ohrid,
MACEDONIA

Hereby declares that the product:

Ariazone 901 - Automotive A/C Service Station

Meets all requirements of European Directives:

2006/95/EC - Low Voltage Directive
2004/108/EC - Electromagnetic Compatibility
98/37/EC - Machine Directive

and subsequent amendments entered in force to the date of declaration.

The producer also declares that equipment confirms Directives and Standards when used according to manufacturer specifications.

Date and place of issuing:

Ohrid, _____

Serial No: _____

Ariazone International
Tullamarine, Victoria
www.ariazone.com

Ariazone International – Europe
www.ariazone.com.mk

Made in Macedonia