

A/C-Service Unit 7KG-MOBIL

Art.-No. 0764 98

Instruction manual





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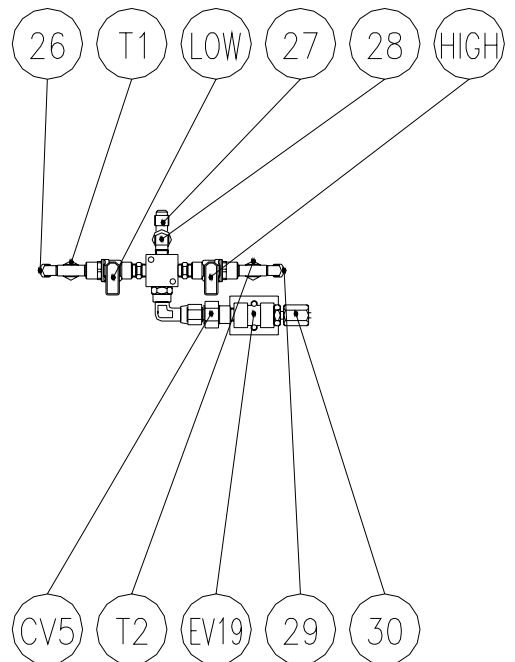
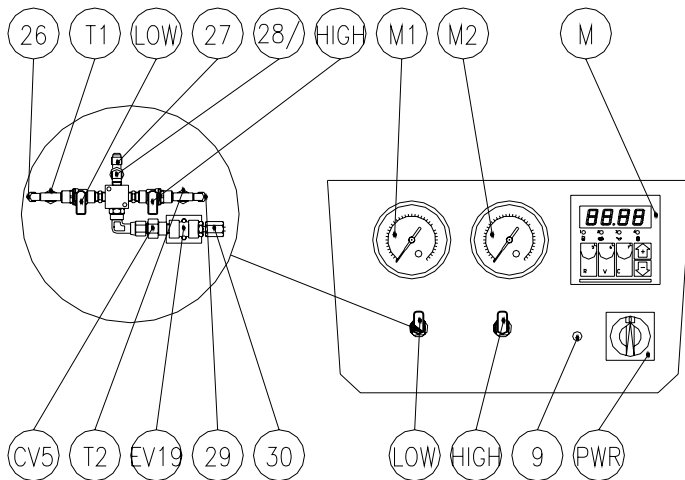
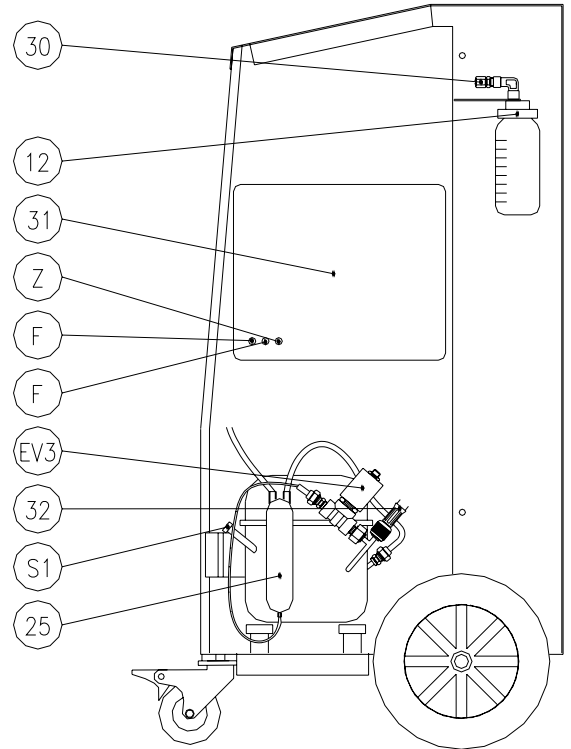
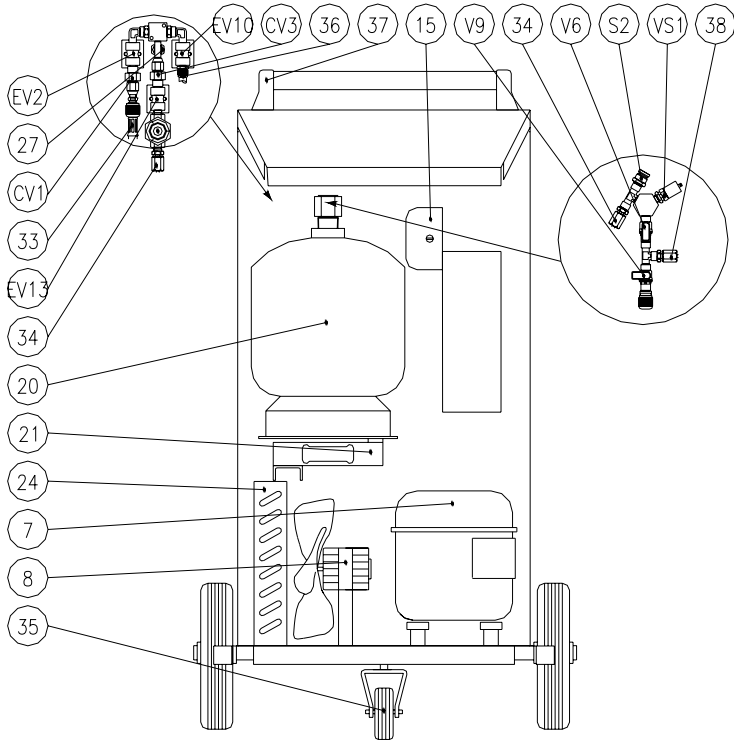
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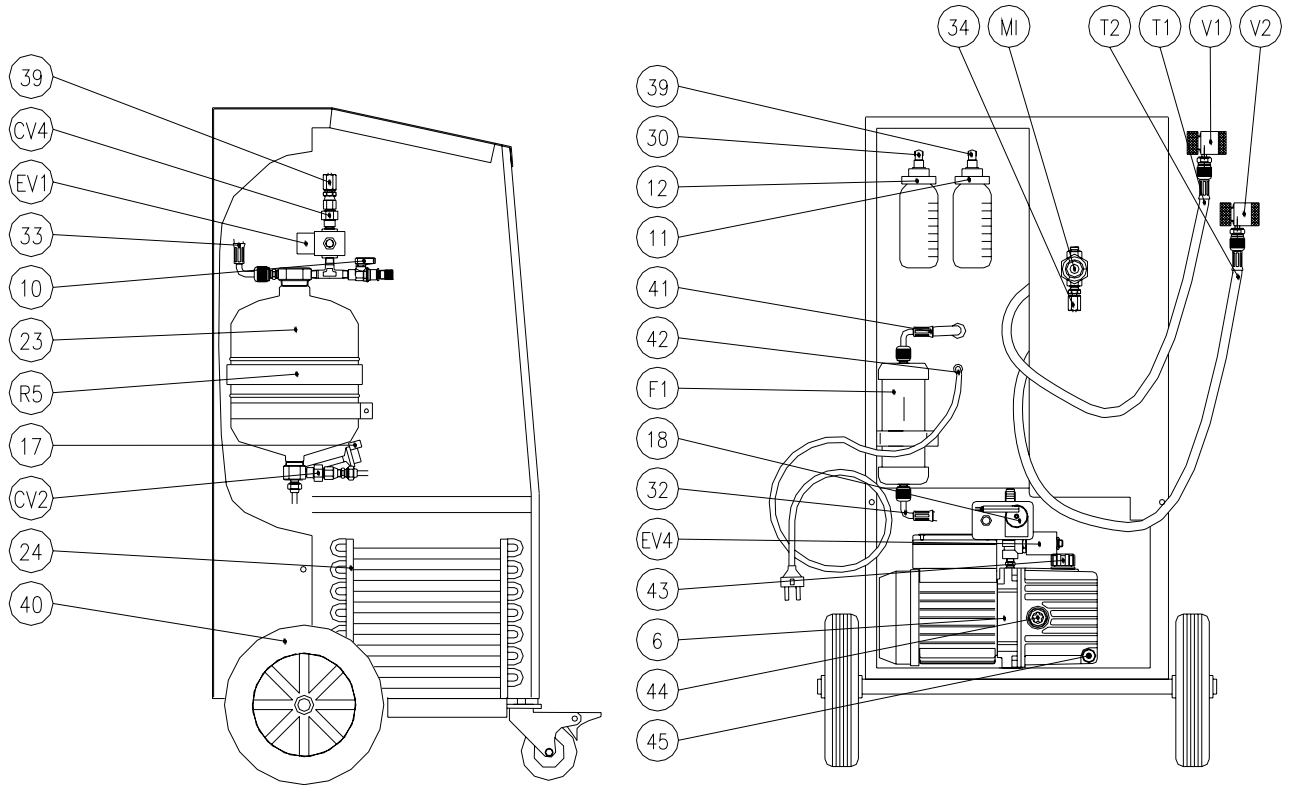
Safety precautions	4
Layout drawing	5/6
Hydraulic diagram	7
Electric scheme	8
Legend	9
1. Introduction to A/CSERVSTAT-6KG unit	10
1.1 Technical specifications	10
2. Components description and standard equipment	10
2.1 High vacuum pump	10
2.2 Refrigerant bottle	10
2.3 Distiller/separator	10
2.4 Moisture indicator	11
2.5 Compressor.....	11
2.6 Filter drier.....	11
2.7 Flexible hoses	11
2.8 Quick coupler valves.....	11
2.9 Control module	12
2.10 Standard equipment	12
3. Control panel	13
4. Preparing unit A/CSERVSTAT-6KG for operation	13
4.1 Checking the vacuum pump oil level.....	13
4.3 "Zero" scale check	14
4.4 Filling refrigerant into the bottle	14
4.4.1 Filling refrigerant into the internal bottle by means of recovery from the service bottle..	14
4.4.2 Emptying the internal bottle	15
5. Recovery.....	16
5.1 Preparing the vehicle for refrigerant recovery from the A/C system	16
5.2 Refrigerant recovery for R = 00.00	16
5.3 Refrigerant recovery for R > 00.00.....	17
6. Draining of the oil extracted from the A/C system	17
7. Evacuating and checking the A/C system for tightness.....	17
8. Refilling oil into the A/C system.....	18
8.1 Warning.....	18
8.2 Oil refilling procedure.....	18
8.3 Suggested oil quantities for refilling the vehicle air conditioner	18
9. Charging refrigerant into the A/C system	19
9.2 A/C system refrigerant charging procedure	19
10. Checking A/C system operating pressures.....	19
11. Recovery-Vacuum-Charge automatic function.....	20
12. Vacuum - Charge automatic function	20
13. Recovery – Vacuum automatic function.....	20
14. Operations before disconnecting the unit from the A/C system	21
15. Routine maintenance.....	21
15.1 Material for routine maintenance.....	21
15.2 Periodic operations	21
15.3 Changing the vacuum pump oil.....	22
15.4 Replacing the filter drier	23
16. Accessories and spare parts.....	24
17. Dimensions and weight	24
18. Display signals.....	25

WARNING**Safety precautions**

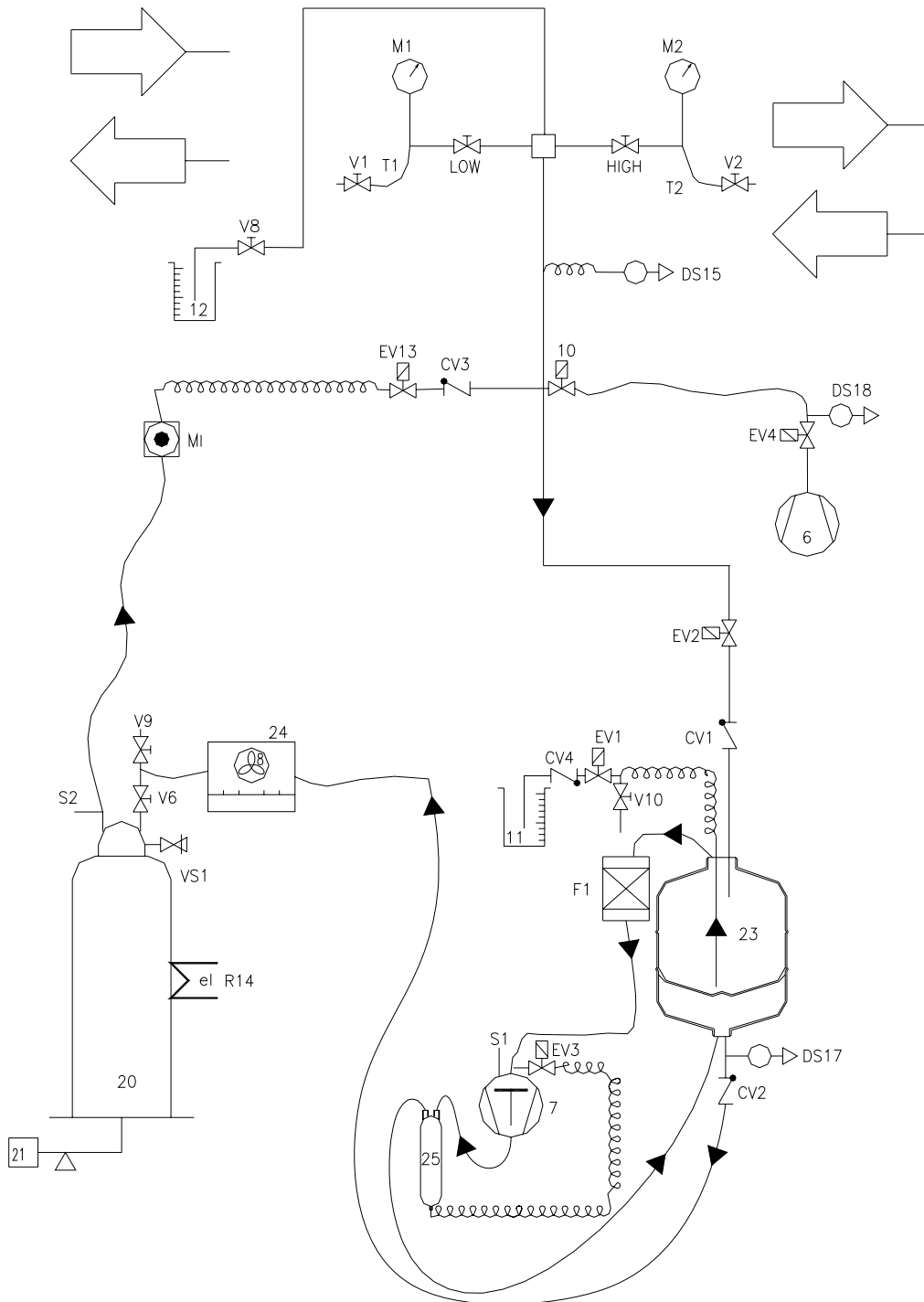
- a) This equipment is designed for trained personnel only, who must know the refrigeration fundamentals, cooling systems, refrigerants and possible damage that pressurized equipment may cause.
- b) Carefully read the instructions contained in this manual; strict observance of the procedures described is fundamental to the operator's safety, the perfect state of the unit and constant performances as declared.
- c) Do not operate the unit with different refrigerant than the one it has been designed for.
- d) Before performing any operation, make sure that the hoses used for connections have been previously evacuated and that they do not contain non-condensable gases.
- e) Avoid skin contact; the low boiling temperature of the refrigerant (about -30°C) can cause freezing.
- f) Avoid breathing refrigerant vapours.
- g) It is recommended to wear suitable protections like safety glasses and gloves; contact with refrigerant may cause blindness and other personal injuries.
- h) Do not operate near open flames and hot surfaces; the high temperatures decompose the refrigerant releasing toxic and caustic substances which are hazardous for the operator and the environment.
- i) Always make sure that the unit is connected to a suitably protected mains supply provided with an efficient earth connection.
- j) Before performing maintenance operations or when the unit will not be used for a long period of time, turn the unit off by turning the main switch to 0 and disconnect the power supply cord; absolutely follow the sequence of operations.
- k) Operate the unit only in locations with suitable ventilation and a high number of air changes.
- l) Before disconnecting the unit, make sure that the cycle has been completed and that all valves are closed in order to avoid release of refrigerant to the atmosphere.
- m) Never fill any tank with liquid refrigerant to more than 75% of its maximum capacity.
- n) During operations avoid release of refrigerant to the environment; this precaution is required by international environmental standards and is essential to avoid difficult leak detection in a refrigerant polluted environment.
- o) The equipment must always work under the operator's control.
- p) Protect the unit from dripping.
- q) Do not modify the calibration of safety valves and control systems.
- r) If you recover refrigerant from a cooling system equipped with a water evaporator and/or condenser, it is necessary to drain water from the evaporator and/or condenser or to keep the circulation pump running during the entire recovery operation in order to avoid frosting.

Layout drawing

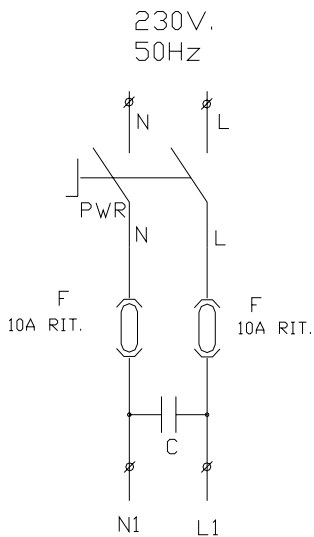
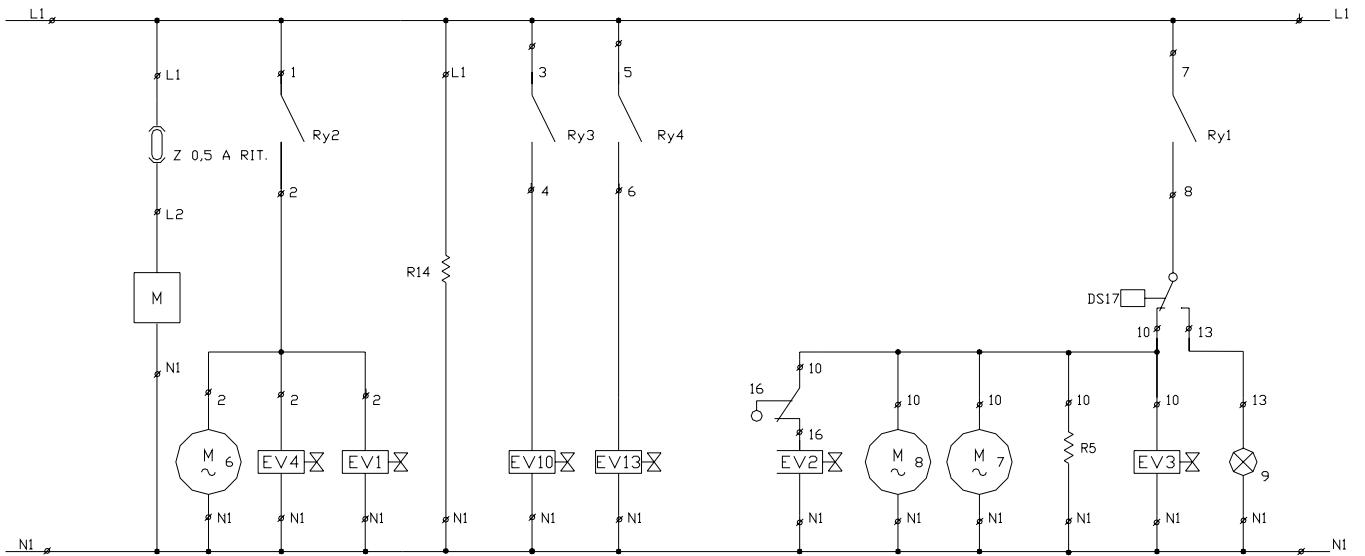




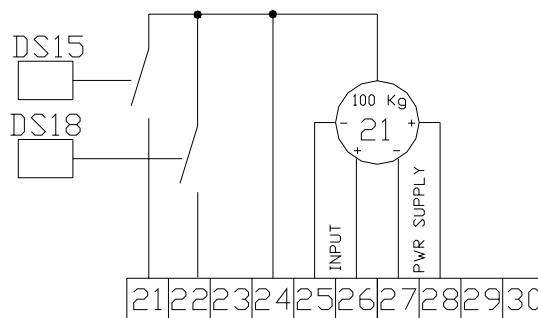
Hydraulic diagram



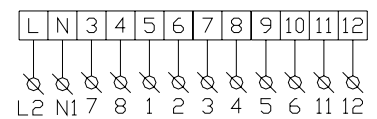
Electric scheme



MORSETTIERA SCHEDA ELETTRONICA (B)



MORSETTIERA SCHEDA ELETTRONICA (B)



Legend

M	Control module	DS18	Vacuum switch
M1	Low pressure gauge	20	Refrigerant bottle
M2	High pressure gauge	21	Refrigerant load cell
PWR	Power switch		
LOW	Valve on low pressure line	23	Distiller
HIGH	Valve on high pressure line	24	Condenser
T1	Low pressure service valve	25	Compressor oil distiller
T2	High pressure service hose	26	Manifold – low pressure gauge connecting hose
V1	Low pressure quick coupler	27	Manifold – valve assembly connecting hose
V2	High pressure quick coupler	28	Capillary tube for vacuum/pressure switch
V6	Valve on the refrigerant bottle	29	Manifold – high pressure gauge connecting hose
V8	Oil / additives charging valve	30	Oil injection hose
V9	Bottle service valve – liquid side	31	Electric box
R5	Heater on the distiller	32	Compressor suction side – filter connecting hose
R14	Heater on the refrigerant bottle	33	Valve assembly – distiller suction side connecting hose
F	Fuse 10A	34	Moisture indicator – refrigerant bottle connecting hose
Z	Fuse 0.5A	35	Rotating wheel
F1	Filter drier	36	Vacuum pump connecting hose
S1	Compressor service connection	37	Handle support
S2	Refrigerant bottle service connection	38	Bottle – condenser connecting hose
VS1	Refrigerant bottle safety valve	39	Oil discharge hose
EV1	Solenoid valve – oil discharge line	40	Wheel Ø 200
EV2	Solenoid valve – recovery line	41	Distiller – filter connecting hose
EV3	Solenoid valve – oil return line to compressor	42	Supply cable
EV4	Solenoid valve – vacuum pump suction line	43	Pump oil filling plug
EV10	Solenoid valve – vacuum test line	44	Pump oil sight glass
EV13	Solenoid valve – refrigerant charging line	45	Pump oil drain plug
CV1	Check valve – recovery line	MI	Moisture indicator
CV2	Check valve – compressor delivery line		
CV3	Check valve – refrigerant charge		
CV4	Check valve – oil discharge line		
2	Recovery compressor		
6	Vacuum pump		
8	Motor fan		
9	Warning light		
10	Valve – distiller manual oil discharge		
11	Oil discharge bottle		
12	Oil charging bottle		
DS15	Pressure/vacuum switch		
DS17	Safety pressure switch		



1. Introduction to 7KG-MOBIL recovery unit

7KG-MOBIL unit permits quick and efficient recovery of refrigerant from the A/C system, refrigerant recycling, system evacuation, check for tightness, additive or lubricant injection, the subsequent charge with refrigerant, measurement of the operating pressures.

7KG-MOBIL features a microprocessor that permits the control of all functions by means of an electronic scale, a control panel with function keys (**R** = recovery, **V** = vacuum, **C** = charge + = increase, - = decrease) and a four digit display visualizing the values in weight or minutes of the different processes selected.

1.1 TECHNICAL SPECIFICATIONS

Model	7KG-MOBIL
Refrigerant	R134a
Maximum storage capacity	7 kg
Maximum recovery rate	400 g/min.
Power supply	230/1/50
Power input	460 W
Storage temperature	-10 ÷ +50 °C
Ambient temperature	0 ÷ 40 °C
Protection degree	IP20
Noise level	< 70dB (A)
Maximum refrigerant charge	6.3 kg

The maximum refrigerant quantity available for charging is calculated by subtracting 0,700 kg from the weight of the refrigerant contained in the bottle and indicated on the display

$$\boxed{\text{max kg for charging} = \text{kg in bottle} - 0,700 \text{ kg}}$$

Model	Connections
7KG-MOBIL	1/4"saе female swivel with ball valve

2. Components description and standard equipment

2.1 HIGH VACUUM PUMP

Essential component for extracting from the cooling system the residues of technical gases used for pressing, ambient air and vapour contained in it as well as water possibly formed through vapour condensation.

The high vacuum pump the unit is equipped with is rotary vane type, lubricated by oil injection..

2.2 REFRIGERANT BOTTLE

Maximum capacity	kg	7
Weight of empty bottle	kg	3.5

It is provided with two connections, one of which with tube (liquid refrigerant) and one without tube (vapour refrigerant), safety valve, non-condensable gas purge and electric heater with thermostat.

2.3 DISTILLER/SEPARATOR

Single body construction, featuring:

- distillation chamber with automatic flow control
- separating chamber for the oil removed from compressor, provided with a device for automatic return at the end of the cycle
- heat exchanger chamber outlet gas / recovered refrigerant
- heat exchanger coil outlet gas / recovered refrigerant

2.4 MOISTURE INDICATOR

It allows checking the moisture degree of the refrigerant in the bottle.

The following table shows the moisture degree in PPM that corresponds to the colour of the inner ring of the indicator.

Moisture content in PPM (parts per million) at different temperatures

Colour		24°C	38°C	52°C
Dark green	DRY	<50	<80	<110
Light green	CAUTION	50÷200	80÷225	110÷310
Yellow	WET	>200	>225	>310

Dark green indicates that the refrigerant is in good conditions.

Light green indicates that the refrigerant contains a still acceptable moisture level.

Yellow indicates that the moisture level of the refrigerant is not acceptable any more and that filter drier replacement is required at the end of the cycle (see 15.4"Replacing the filter drier").

2.5 COMPRESSOR

The compressor is of the hermetic type.

2.6 FILTER DRIER

Antiacid filter drier with a total water absorption capacity of 40 g.

2.7 FLEXIBLE HOSES

The hoses are barrier and heavy duty type, of weatherproof polymer basis with fabric plait inserts.

Their flexibility assures easy connection in any situation. They withstand the cooling system operating pressures and keep the section passage intact even when operating in vacuum.

7KG-MOBIL feature hoses with quick coupler valves.

2.8 QUICK COUPLER VALVES

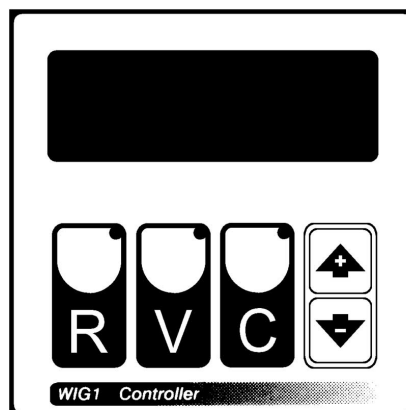
Mounted on the hose ends and provided with a coloured operating ring (blue = low pressure, ref. V1; red = high pressure, ref. V2) for quick identification.

2.9 CONTROL MODULE

When the unit is turned on (PWR switch to position I), the display shows the refrigerant quantity in kg contained in the bottle (see 1.1 "Technical specifications").

Thanks to the microprocessor and the electronic scale, the **7KG-MOBIL** unit is completely computerized and controlled by means of the keyboard located on the upper panel.

The **7KG-MOBIL** unit is provided with a large sized display to allow for good reading even with bad illumination; the 4-digit display allows for reading the parameters connected to the selected function and, if necessary, it indicates the operating or function error code



- a) When pressing the **R**, **V**, **C** keys for less than 2 seconds, the corresponding functions immediately start. The LED of the relevant function key lights to confirm the operation.
- b) The unit will perform the various functions according to the pre-set default values.
- c) These values can be changed by depressing the function key more than 2 seconds until the LED blinks and the display shows the pre-set value.
- d) Press **+** or **-** to change this value.
- e) Press the function key again to confirm the new value that has been set.
- f) The unit is now ready for operation with the new values.
- g) The display now shows the refrigerant in kg contained in the bottle.
- h) By pressing the **-** key during the performing of any function the present function will be stopped and the refrigerant in kg contained in the bottle will be displayed
- i) By pressing the **+** and **R** keys at the same time, the Recovery, Vacuum and Charging functions will start automatically one after the other.
- j) By pressing the **V** and **+** keys at the same time, the Vacuum and Charging functions will start automatically one after the other.

2.10 STANDARD EQUIPMENT

Every unit is supplied with the following equipment:

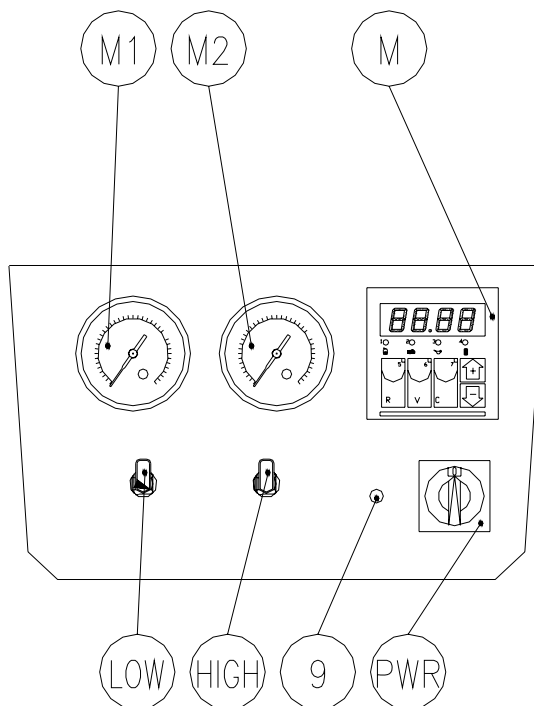
- Multilingual label to be applied on the control panel
- Flexible hose
- Plastic Dust cover

For more details, see 16. "Accessories and spare parts"

3. Control panel

The upper panel of the unit contains all control elements needed for operation, checking for tightness and measuring the A/C system operating pressures.

A multilingual sticker provides a rapid guide to the use of the unit and allows the operator to check the correct position of the control components during operation.



4. Preparing unit 7KG-MOBIL for operation

WARNING

The presence of the synoptic sticker does not exempt the operator from carefully reading this manual and strictly observing the described procedures.

4.1 CHECKING THE VACUUM PUMP OIL LEVEL

Before checking the oil level, the unit must be placed on a level surface and its power supply must be **turned off**.

The user must check that the vacuum pump oil level covers half of the sight glass (see drawing on page 23).

4.2 "ZERO" SCALE CHECK

- a) connect the unit to the power supply
- b) turn the **PWR** switch to position **1**
- c) make sure that the bottle is empty
- d) wait at least 5 minutes so that the bottle/scale assembly stabilizes before proceeding; the display must show a value between **00.30** and **00.50**. If the value is lower or higher than the above indicated one, the scale must be reset by acting on the electronic control module as follows :
 - e) press **-** and **R** at the same time; **TARE** will appear on the display; press **C** to perform the tare.
 - f) press **+** and **-** at the same time for more than 1 second: **COST** will appear on the display
 - g) press the **C** key several times until **TARE** appears on the display followed by a value
 - h) deduce **0.35** to the value appeared on the display by pressing the **-** key and press **C** again to confirm
 - i) press the **R** key or **V** key to exit
 - j) **0.35** will appear on the display, now put a sample weight on the scale and check that on the display you can read the value of this sample weight + **0.35**
 - k) if this is not the case, press the **V** and **-** keys at the same time; the value on the display will flash
 - l) by pressing the **+** and **-** keys, display the value of the sample weight + **0.35**
 - m) press **C** to confirm
 - n) remove the sample weight and make sure that on the display you read **0.35**

4.3 FILLING REFRIGERANT INTO THE BOTTLE

When all the above mentioned preliminary operations have been performed, the recommended quantity of about 2- 3 kg of refrigerant must be filled into the unit, the recommended quantity enables the refrigerant recovery from the A/C system and its following charge.

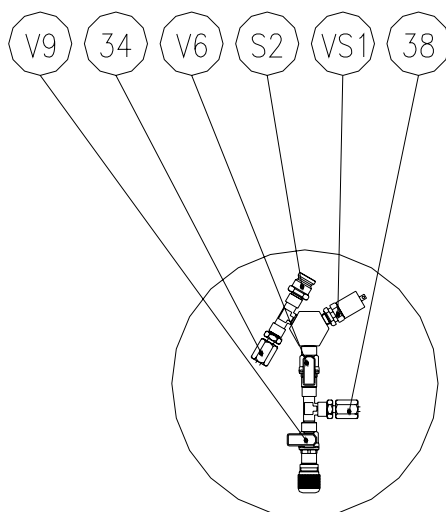
4.3.1 FILLING REFRIGERANT INTO THE INTERNAL BOTTLE BY MEANS OF RECOVERY FROM THE SERVICE BOTTLE

- a) connect the unit to the power supply
- b) make sure that all valves on the control panel are closed and that the **PWR** switch is in position **0**
- c) position the service bottle so that liquid refrigerant will come out (bottle with tube upright, bottle without tube upside down)
- d) remove the **V2** quick coupler valve (red valve) from the **T2** high pressure hose or use the suitable adapters
- e) connect the **T2** hose to the service bottle
- f) turn the **PWR** switch to position **I**
- g) push the **V** button (**00.30** will be displayed and the vacuum pump starts) and open the **HIGH** valve located on the panel in order to evacuate the **T2** hose
- h) leave the vacuum pump running for about 5 minutes
- i) after 5 minutes press the **V** key to stop the pump; press again the **V** key to exit from **Vacuum - Test** function. Test-Vuoto.
- j) press the **R** key for more than two seconds; **REC** and **0.00** alternately blink on the display indicating that the recovery programming is ready
- k) using the **+** key, set **02.00** or **03.00** referring to the quantity of refrigerant in kg that will be transferred into the unit bottle
- l) press the **R** key to store the selected value
- m) slowly open the bottle valve
press again the **R** key to start recovery; the unit automatically stops as soon as the previously set quantity has been transferred into the bottle of the unit. The quantity of recovered refrigerant will be displayed by pushing the **+** key

- n) close the service bottle valve
- o) press the **R** key for more than 2 seconds and set a value of **R=00.00** by means of the + and – keys
- p) press the **R** key to confirm
- q) press the **R** key to recover the refrigerant there is inside the hose and wait for the unit to stop automatically
- r) disconnect the **T2** hose from the service bottle
- s) rimontare la valvola ad innesto V2 (rubinetto rosso) sul tubo flessibile T2
- t) remount the **V2** (red valve) quick coupler valve on the **T2** flexible hose
- u) press the **V** key (**00.30** appears on the display and the vacuum pump starts): evacuate for about 5 minutes
- v) stop the vacuum pump by pressing twice on the **V** key
- w) turn the **PWR** switch to position **0** if the unit will not be used immediately

4.3.2 EMPTYING THE INTERNAL BOTTLE

- a) make a vacuum in an external bottle able to contain the refrigerant there is in the internal bottle
- b) remove the cover
- c) connect the **T2** hose to the **S2** service connection on the bottle by means of the service hose supplied with the unit connect the external bottle valve to the **V9** valve situated on the internal bottle and close the **V6** valve
- d) make sure that the value **R=0.00** is set (see 2.9 Control module)
- e) open the **V9** valve and the valve on the external bottle
- f) open the **HIGH** valve on the control panel
- g) start the Recovery automatic function in order to empty the internal bottle completely.
- h) recovery will stop automatically
- i) close the **V9** valve and the valve on the external bottle and disconnect the service hose.
- j) start the vacuum and vacuum test function for about 30 minutes
- k) at the end of the vacuum and vacuum test function, disconnect the **T2** hose from the **S2** service connection and proceed to the scale calibration (see section 4.4)
- l) at the end of operations, open again the **V6** valve and remount the cover.



5. Recovery

WARNING

During recovery, regulate the LOW and HIGH valves on the control panel, so that the input pressure never rises over 5 bar.

When the Recovery function has been started, it will only last **30 minutes**. In case the pre-set quantity of refrigerant has not been recovered within 30 minutes, the unit will stop automatically and the recovered quantity of refrigerant will blink on the display.

5.1 PREPARING THE VEHICLE FOR REFRIGERANT RECOVERY FROM THE A/C SYSTEM

The preliminary preparation of the vehicle facilitates the separation of refrigerant and lubricant and prevents the latter from being dragged.

- a) Turn on the engine with closed hood. Turn the A/C system on and have it run for some minutes.
- b) Open the hood and set the A/C system fan to maximum speed.
- c) Have the vehicle engine run slowly (800 - 1200 revolutions/min) for at least 20 minutes.
- d) Turn the vehicle engine off and have the A/C system fan run at maximum speed and start recovery operations.

5.2 REFRIGERANT RECOVERY FOR R = 00.00

This function allows for total recovery of the refrigerant. The unit automatically stops, when the A/C system reaches a residual internal pressure of -0, 2 bar

Make sure that all valves are closed and that the **PWR** main switch is in position **0**.

- b) Connect the **V1** valve of the **T1** hose to the A/C system low pressure access port.
- c) Connect the **V2** valve of the **T2** hose to the A/C system high pressure access port.
- d) Open the **V1** and **V2** valves
- e) Turn the power on by turning the **PWR** main switch to position **I**.
- f) Press the **R** key for more than two seconds: **REC** and its value will blink alternatively on the display
- g) Set a **REC** value of **00.00** by means of **+** and **-**, and press the **R** key to confirm
- h) Open the **LOW** and **HIGH** valves located on the control panel.
- i) Press the **R** key to start recovery: the led on the **R** key is on and the display indicates the quantity of refrigerant which is being recovered; if there is no refrigerant, the function will not be activated. Press the **-** key to stop the function at anytime and press the **+** key to read the quantity of refrigerant contained in the bottle.
- j) At the end of recovery, the unit stops automatically and waits for 2 minutes (the led on the **R** button blinks)
- k) If during these 2 minutes the pressure inside the A/C system rises beyond 0,6 bar, the unit will automatically start another recovery cycle, the led on the **R** key will stop blinking and the quantity of refrigerant that the unit is recovering will be displayed alternately to the number of recovery cycles (Ex. =1)
The unit can perform only 5 recovery cycles.
If the pressure inside A/C system still rises beyond 0,6 bar even after the fifth recovery cycle, the unit will automatically stop the operations and the message **Erro** will be displayed.
- l) If after the 2 minutes the pressure does not rise beyond 0,6 bar, the unit will automatically stop and the quantity of refrigerant contained in the bottle will be displayed; all the refrigerant contained in the A/C system has been recovered. Close the **LOW** and **HIGH** valves and the **V1** and **V2** valves.
- m) At the end of the function the latest quantity of refrigerant recovered will be displayed by pushing the **+** key

WARNING

The bottle in the recovery unit has a maximum capacity of 7 kg of refrigerant.

*If the maximum level is reached during recovery (7.00 will appear on the display), the unit will stop automatically. Transfer the refrigerant from the bottle to a suitable external tank connecting it to the **S2** service*

connection by means of a previously evacuated hose, or perform a charging cycle (see 9. "Charging refrigerant into the A/C system")

5.3 REFRIGERANT RECOVERY FOR R<>00.00

This function allows the recovery of a preset quantity of refrigerant, the unit automatically stops, when the preset quantity has been recovered.

- a) make sure that all valves are closed and that the **PWR** main switch is in position **0**
- b) connect the **V1** valve of the **T1** hose to the A/C system low pressure service connection
- c) connect the **V2** valve of the **T2** hose to the A/C system high pressure service connection
- d) turn the power on by turning the **PWR** main switch to position **I**
- e) press the **R** key for more than 2 seconds: **REC** and its value will blink alternately on the display
- f) set a **REC** value higher than **00.00** by means of **+** and **-**, and press the **R** key to confirm
- g) open the **LOW** and **HIGH** valves on the control panel
- h) press the **R** key to start recovery; if there is no refrigerant, the function will not be activated
- i) press the **-** key to stop the function; press the **+** key to read the quantity of refrigerant contained in the bottle
- j) at the end of recovery, the unit stops automatically and the quantity of refrigerant inside the bottle will be displayed.
- k) disconnect hoses **T1** and **T2** from the system. By pressing the **+** key on the control module, the latest refrigerant quantity recovered will be displayed
- l) press the **R** key for more than 2 seconds and by means of the **+** and **-** keys, set R=00.00
- m) press the **R** key to confirm
- n) press the **R** key to recover the refrigerant there is inside the hose and wait for the unit to stop automatically
- o) close the **LOW** and **HIGH** valves

NB : If during the function the unit stops, the led on the R button blinks and the quantity of recovered refrigerant blinks on the display, it means that there is no refrigerant left inside the A/C system and so it's impossible to recover the pre-set quantity of refrigerant

WARNING

The bottle in the recovery unit has a maximum capacity of 7 kg of refrigerant.

*If the maximum level is reached during recovery (7.00 will appear on the display), the unit will stop automatically. Transfer the refrigerant from the bottle to a suitable external tank connecting it to the **S2** service connection by means of a previously evacuated hose, or perform a charging cycle (see 9. "Charging refrigerant into the A/C system")*

6. Draining of the oil extracted from the A/C system

During vacuum function, the draining of the oil extracted from the A/C system will automatically be effected into the graduated bottle **11**.

The operator will then have to write down the quantity of drained oil, as the oil will have to be reintegrated later.

WARNING

Do not pollute environment with oil; it is a special waste and must be disposed of according to the regulations in force

7. Evacuating and checking the A/C system for tightness

This operation serves to remove any trace of ambient air, water vapour and other possibly contained non condensable gases from the A/C system, so that it is possible to fill it with refrigerant. A possible deterioration of the vacuum degree after this operation indicates that there are air infiltrations which would transform into refrigerant leaks after having charged the A/C system.

- a) make sure that all valves on the control panel are closed and that the **PWR** switch is in position **0**
- b) connect the **V1** valve of the **T1** hose to the A/C system low pressure service connection

- c) connect the **V2** valve of the **T2** hose to the A/C system high pressure service connection
- d) open the **LOW** and **HIGH**
- e) turn the **PWR** switch to position I
- f) Press the **V** key; **00.30** is displayed and the vacuum pump starts (see 2.9 "Control module" for changing the pre-set values). The reading **STOP** on the display indicates the presence of refrigerant in the A/C system; perform another recovery cycle before evacuating
- g) Make sure that the display does not blink and that the count-down begins within 5-10 minutes; if this is not the case, stop evacuation and find the leak in the circuit.
- h) The function will stop automatically as soon as the pre-set time is over and the **Vacuum Test** will start for about 3 minutes.
- i) if the **Vacuum Test** function ends without having displayed the **Erro** message, it means that the system evacuation came to a successful conclusion; on the contrary if, during the 3 minutes of **Vacuum Test**, the message **Erro** appears on the display, it means that there are leaks in the circuit, which must be found and repaired.

8. Refilling oil into the A/C system

After A/C system evacuation and before charging, the same quantity of oil as the one extracted during refrigerant recovery must be refilled into the A/C system (see 6. "Draining oil extracted from the A/C system").

For a correct performance of this procedure, the operator must use the dosimeter with valve supplied with the unit

8.1 WARNING

Lubricant is highly hygroscopic. To avoid contamination, always keep the bottles well closed and open them only before use.

Oil injection must be performed only when the A/C system is properly evacuated.

8.2 OIL REFILLING PROCEDURE

- a) **make sure that all the valves on the control panel are closed**
- b) make sure that the **V8** lubricant injection valve is closed and remove the oil dosimeter **ref. 12**
- c) open the dosimeter and fill it with a higher quantity of oil than the one previously extracted during recovery; otherwise air and humidity would also be sucked into the A/C system.
- d) correctly close the dosimeter and put it again on the scale pan. Reinsert the small charging hose inside the hole.
- e) open the **LOW** valve on the control panel if you want to charge oil from the low pressure side; open the **HIGH** valve if you want to charge oil from the high pressure side.
- f) slowly open the **V8** valve on the dosimeter and have the oil sucked in
- g) close the **V8** valve as soon as the pre-set quantity of oil has been charged
- h) close the valve, which was opened before (**LOW** or **HIGH**) on the control panel

WARNING

Do not pollute environment with oil ;it is a special waste and must be disposed of according to the regulations in force.

8.3 SUGGESTED OIL QUANTITIES FOR REFILLING THE VEHICLE AIR CONDITIONER

According to the type of A/C system component you have replaced, you need to fill in the lubricant quantity indicated below, even if no oil has been extracted during recovery.

Evaporator:	50 cc
Condenser:	30 cc
Liquid receiver:	10 cc
Piping:	10 cc

In any case the operator must follow the instructions of the A/C system manufacturer

9. Charging refrigerant into the A/C system

9.1 WARNING

Before performing a charging operation, check the quantity of refrigerant available in the bottle; the bottle must contain more refrigerant than needed for charging. If it does not, do not charge the A/C system and fill refrigerant into the bottle (see 4.5 "Filling refrigerant into the bottle").

NB. The quantity of refrigerant available for charging is equal to the refrigerant in the bottle minus 0,700 Kg
 $Q_{\text{charge}} = Q_{\text{in bottle}} - 0,700 \text{ Kg}$
 If four segments appear at the bottom of display the charging function does not start and it means that refrigerant is missing in the bottle. Refill the bottle with refrigerant (see 5.3 Refrigerant recovery for R<>00.00)

9.2 A/C SYSTEM REFRIGERANT CHARGING PROCEDURE

- a) make sure that all valves on the control panel are closed and that the **PWR** switch is in position **I**
- b) press the **C** key for more than 2 seconds: the display will blink; by means of the + or - key, set the refrigerant quantity to be charged by means of + or - . Ex. 1Kg (**01.00** on the display)
IMPORTANT: By setting **C=00.00** the unit will transfer all the refrigerant contained in the bottle minus **0.700 Kg**
- c) press the **C** button to store the selected value
- d) press the **C** key again to start the charging function. If no refrigerant is available, the function will not be activated and 4 segments appear on the display (see 18. "Display signals")
- e) open the **LOW** valve on the control panel if you want to charge refrigerant on the low pressure side; open the **HIGH** valve on the control panel if you want to charge refrigerant on the high pressure side; open both valves on the control panel if you want to charge on both sides during the charge the quantity of refrigerant left in the bottle can be displayed by pressing the + key; press the - key to stop the function at any time
- g) as soon as the previously selected quantity has been charged into the A/C system, the unit stops and the quantity of refrigerant left in the bottle appears on the display
- h) close the valve or valves (**LOW** and/or **HIGH**) previously opened
- i) when the function is completed, press the + key on the control module and the latest quantity of refrigerant charged in the A/C system with - before will be displayed (Ex. -00.32 = 320g of refrigerant charged)
- j) using an electronic leak detector, check the A/C system for refrigerant leaks

10. Checking A/C system operating pressures

- a) make sure that the **LOW** and **HIGH** valves are closed and that the **T1** and **T2** hoses are connected to the A/C system
- b) start the motor and turn the A/C system on
- c) wait some minutes to permit stabilisation of pressures
- d) make sure that the values of the pressures correspond to those supplied by the A/C system manufacture A/C

11. Recovery-Vacuum-Charge automatic function

Before performing the Recovery, Vacuum and Charge function automatically, it is necessary to set **R=00.00** because in order to start the Vacuum function automatically, all the refrigerant in the A/C system must have been recovered.

Press the **+** and **R** keys at the same time, after having set the **R**, **V** and **C** values.

During the automatic function the led of the function being performed will light whereas the led of the following function will blink.

If, during the Recovery function, the message **Erro** appears on the display, the led on **R** key is on and the led on the **V** key is blinking, it means that the pressure in the A/C system has risen beyond 0,8 bar and that the unit has performed the five recovery cycles available.

Press the - key to stop the function.

If during the **Vacuum Test** the message **Erro** is displayed, the led on the **V** key is on and the led on the **C** key is blinking, it means that there is a leak in the A/C system and the charging function will not start. Press the - key to stop the function; detect the leak and repair it.

Important : **The necessary virgin oil must be reintegrated at the end of the cycle using the oil injector model not supplied with the unit.**

12. Vacuum - Charge automatic function

In order to perform the Vacuum and Charge functions automatically, press the **+** and **V** keys, after having set the **V** and **C** values.

During the automatic function the led of the function being performed will light whereas the led of the following function will blink.

If during the **Vacuum Test** the message **Erro** is displayed, the led on the **V** button is on and the led on the **C** button is blinking, it means that there is a leak in the A/C system and the charging function will not start. Push the - button to stop the function; detect the leak and repair it.

Important : **The necessary virgin oil must be reintegrated at the end of the cycle using the oil injector model not supplied with the unit.**

13. Recovery – Vacuum automatic function

In order to perform the Recovery and Vacuum functions automatically, press the **R** key and within 2 seconds the **V** key, after having set the **R** and **V** values.

During the automatic function the led of the function being performed will light whereas the led of the following function will blink.

If during the **Vacuum Test** the message **Erro** is displayed and the led on the **V** button is on, it means that there is a leak in the A/C system.

Push the - button to stop the function; detect the leak and repair it.

14. Operations before disconnecting the unit from the A/C system

- a) With the A/C system compressor on, close the **V2** valve and disconnect the **T2** hose. Make sure that the **V1** valve is open and connected to the A/C system
- b) open the **LOW** and **HIGH** valves in order to have all the liquid refrigerant be sucked by the A/C system
- c) As soon as the pressures on the high and low pressure gauges are the same and do not exceed 2÷3 bar, close the **V1** valve and disconnect the **T1** hose from the A/C system
- d) perform a recovery cycle to extract the remaining refrigerant from the hoses so that the unit is immediately ready for the next operation
- e) turn the unit off (**PWR** switch in position **0**)
- f) close the **LOW** and **HIGH** valves
- g) reposition **T1** and **T2** in their support
- h) carefully screw the protective caps on the A/C system service valves
- i) using a leak detector, check the A/C system again for leaks

Note: The introduction of UV-additives and the following use of a UV leak detector will make it easier to locate the point of the possible leak in the future.

15. Routine maintenance

15.1 MATERIAL FOR ROUTINE MAINTENANCE

1 filter drier	Art.No. 0707 764 052
Vacuum pump oil	Art.No. 0892 764 300
Gaskets for 3/8SAE hoses	Art.No. 0764 000 053

15.2 PERIODIC OPERATIONS

- a) **Check all swivel connections for tightening every 10 operations.**
- b) Check the vacuum pump oil level; the oil level must be checked at least every 20 hours of operation. The pump must be off when checking the oil level.

15.3 CHANGING THE VACUUM PUMP OIL

The oil must be changed every 100 hours of operation and at least once every 12 months, even if the unit is not used regularly.

The oil also needs to be changed whenever it becomes cloudy. Contaminated oil reduces vacuum pump performances and irreversibly damages its mechanical components.

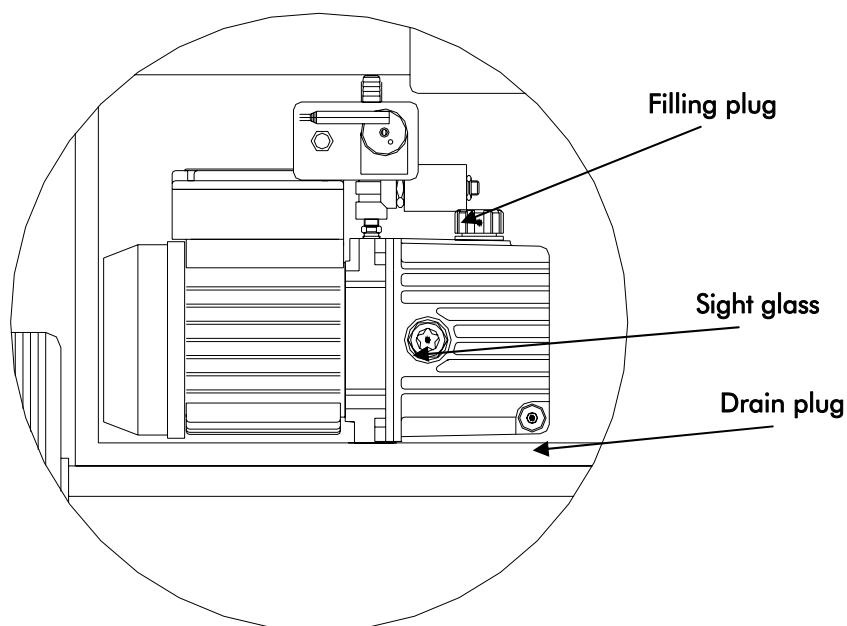
All draining and refilling operations must be performed when the pump is turned off.

To avoid reduction of the pump efficiency and to maintain its performances, use only our vacuum pump oil for maintenance.

- a) Before draining the oil have the pump run for at least 10 minutes (see 7. "Evacuating and checking the A/C system for tightness", item g) with the **HIGH** and **LOW** valves closed.
- b) **turn the recovery unit off by turning the PWR switch to position 0 and disconnect the power cord; strictly observe the sequence of operations**
- c) remove the panel at the back of the unit
- d) unscrew the drain plug located at the bottom of the pump
- e) completely drain the oil
- f) screw the drain plug on again
- g) unscrew the filler plug situated on top of the pump
- h) slowly refill the pump with oil until the level covers half of the sight glass located on the side of the pump
- i) screw the oil plug on again and install the previously removed panel again

WARNING

Do not pollute environment with oil; it is a special waste and must be disposed of according to the regulations in force.

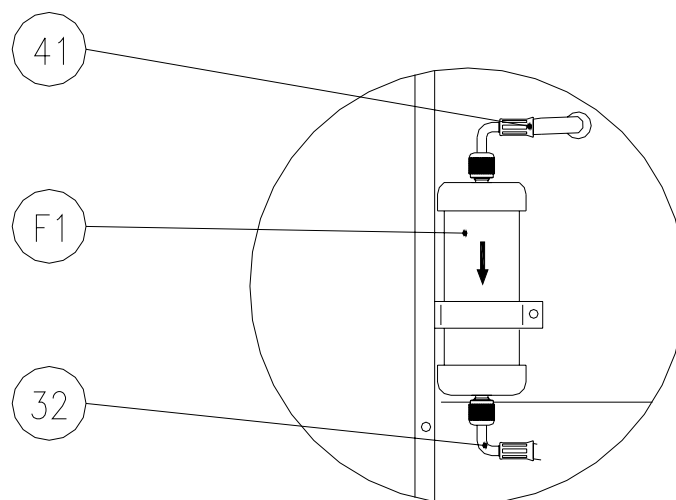


15.4 REPLACING THE FILTER DRIER

Replace the filter drier when the colour of the moisture indicator (rif. **MI**) situated on the back of the unit is different than dark green (**DRY**), see 2.4 "Moisture indicator".

The replacement must be made at the end of a recovery cycle.

- a) **turn the recovery unit off by turning the PWR switch to position 0 and disconnect the power cord; strictly observe the sequence of operations**
- b) remove the **F1** filter drier



WARNING

Do not pollute environment with the used filter; it is a special waste and must be disposed of according to the regulations in force.

- c) remove the gaskets (ref. 41 and 32) inside the flexible hoses
- d) install new gaskets
- e) install a new filter drier
- f) remove the panel on the side of the unit
- g) connect the **V1** valve to the **S1** compressor service connection
- h) open the **LOW** valve
- i) plug the unit in and turn the **PWR** switch to position **I**
- j) press the **V** key to start the vacuum pump and keep evacuating for about 30 minutes
- k) at the end of vacuum operation, close the **LOW** valve and disconnect the **T1** hose from the **S1** connection
- l) remount the protective cap on **S1** and remount the panel.

16. Accessories and spare parts

Description

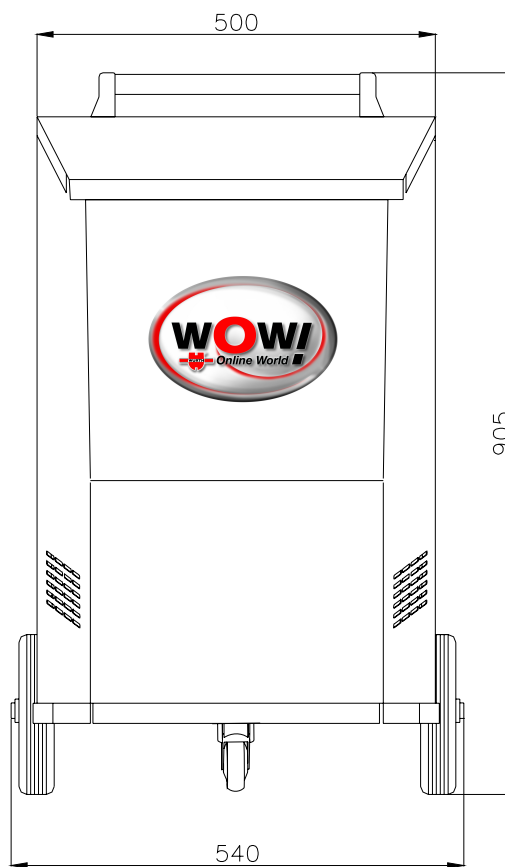
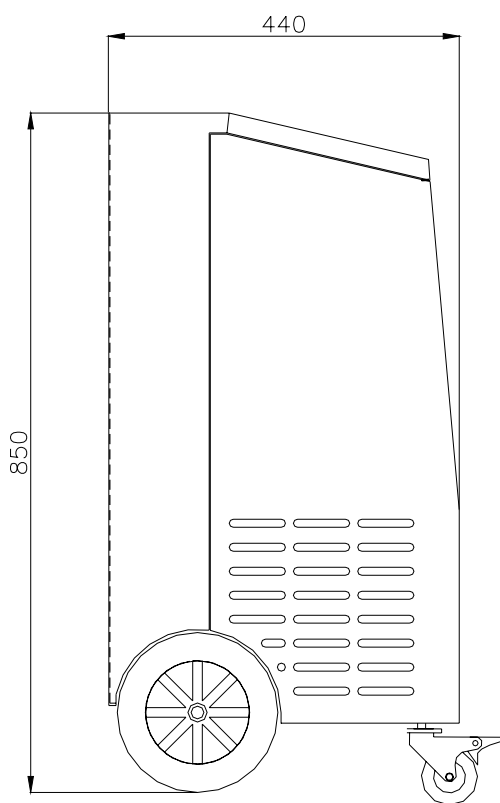
F1 filter drier
Vacuum pump oil
kit of gaskets for 3/8"SAEflexible hoses

Art.No. 0707 764 052

Art.No. 0892 764 300







Art.No. 0764 000 053

17. Dimensions and weight



Net weight: 52 kg

18. Display signals

Display signal	Cause	Suggested remedy
	Value set in Recovery function for R<>00.00 higher than the quantity of refrigerant that can be recovered and which is to be transferred into the unit's bottle. (Weight + Rec. > 7 kg)	Change the programmed quantity of refrigerant to be recovered (Rec.), so that the weight of the refrigerant in the bottle plus the set value do not exceed 7 kg. Discharge the refrigerant contained in the unit so that the programmed quantity of refrigerant can be recovered.
	Leak in the circuit during Vacuum Test . Refrigerant in the hoses at the end of the recovery function for R<>00.00 and after 5 recovery cycles	Find and repair the leak. Disconnect T1 and T2 Perform then another recovery cycle setting R=00.00
	Full bottle During recovery for R <>00.00 when 7kg are reached, the unit stops and the weight of the refrigerant contained in the bottle is displayed (7.00).	Transfer the refrigerant contained in the unit bottle into a suitable external tank. Then, continue the recovery function
	Presence of refrigerant in the system just before performing the vacuum function. Pressure switch 15 not calibrated or defective switch.	Perform the Recovery function R first. Calibrate the pressure switch and replace it, if necessary.
	Lack of refrigerant available for charging for a value of C <>00.00 . (Weight - Charge < 0.7 kg)	Absorb the quantity of refrigerant needed for charging. Reduce the charging value
	During the charging function for C=00.00 the message indicates that the function has stopped since the refrigerant left in the bottle is 0.700 kg	