Instruction manual

Automatic A/C-Service UnitCoolius 2000

Art.-No. 0900764971

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CONTENTS

Safety precautions

- 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.
- 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.
- Do not operate the unit with different refrigerant than the one it has been designed for.
- 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.
- Avoid skin contact; the low boiling temperature of the refrigerant (about -30°C) can cause freezing.
- Avoid breathing refrigerant vapours.
- It is recommended to wear suitable protections like safety glasses and gloves; contact with refrigerant may cause blindness and other personal injuries.
- 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.
- Always make sure that the unit is connected to a suitably protected mains supply provided with an efficient earth connection.
- 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.
- Operate the unit only in locations with suitable ventilation and a high number of air changes.
- 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.
- Never fill any tank with liquid refrigerant to more than 75% of its maximum capacity.
- 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.
- The equipment must always work under the operator's control.
- Protect the unit from dripping.
- Do not modify the calibration of safety valves and control systems.
- 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.

General user information

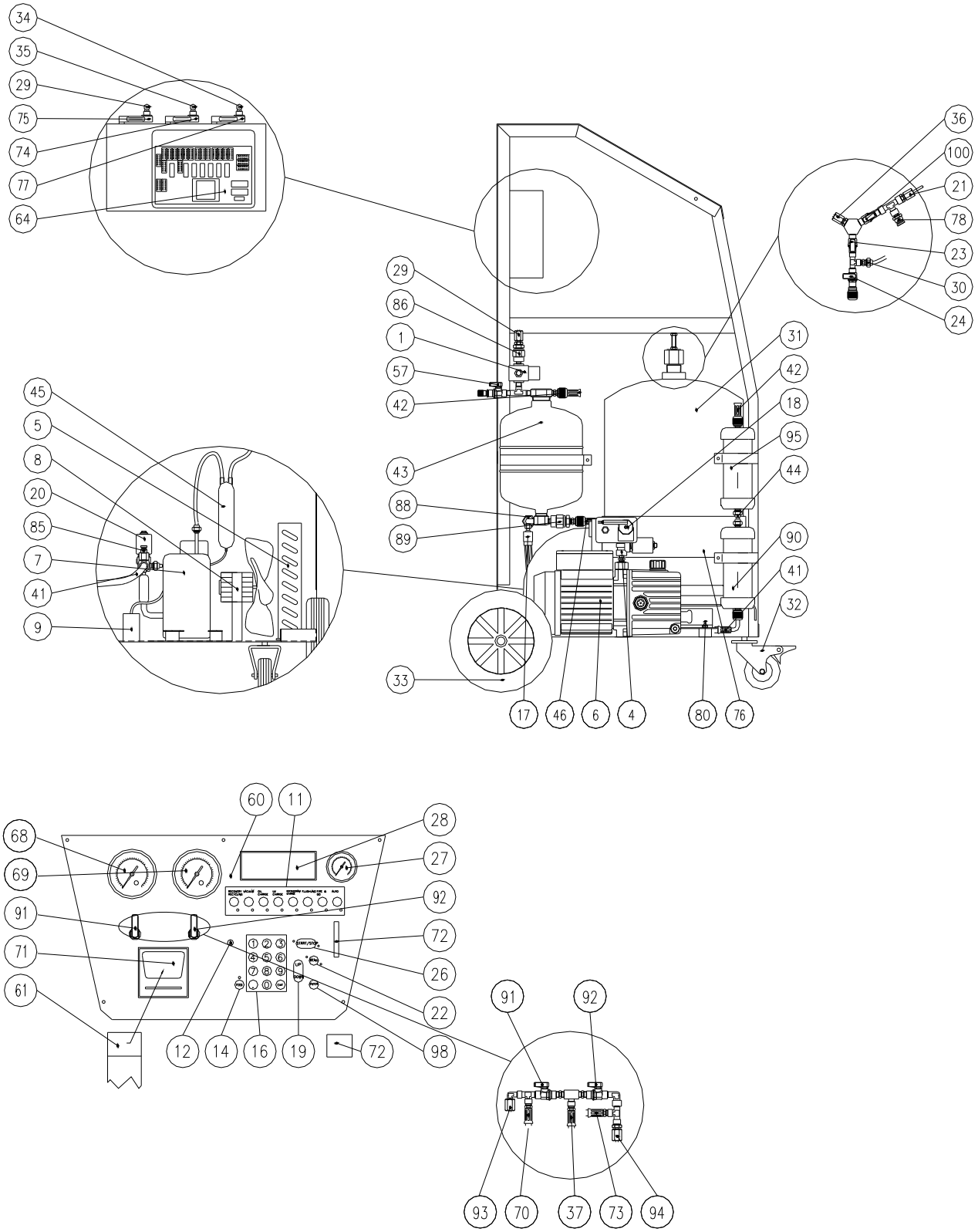
Perform a good vacuum phase before charge!

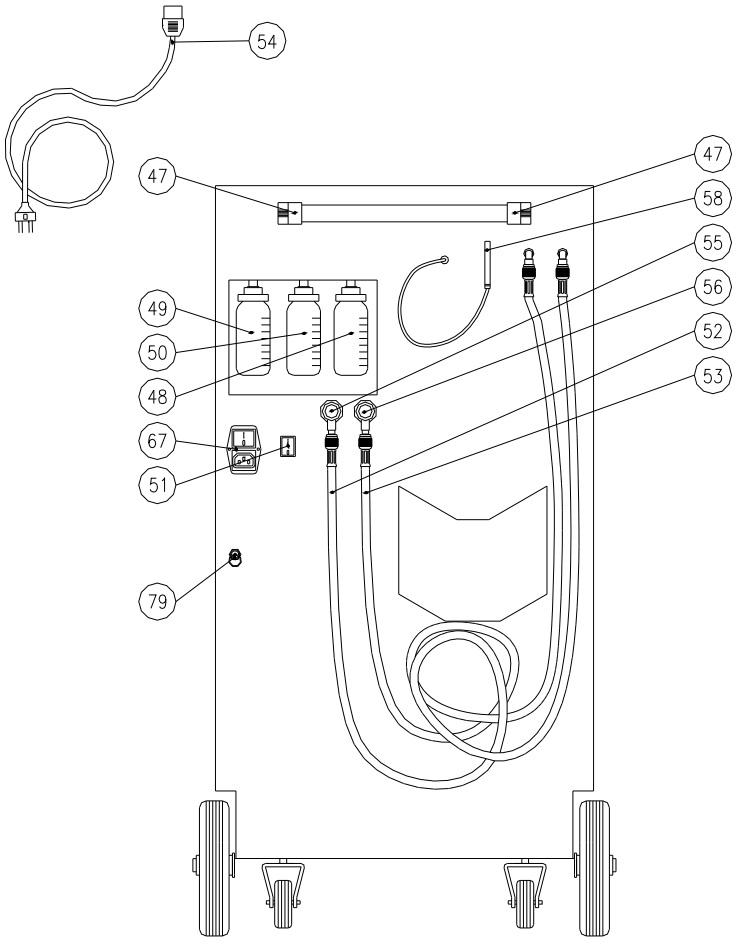
Perform a refrigerant charge after charged compressor oil or UV!

Please empty out the used oil tank before you start the recovery phase!

⚠ *WARNING!*
Disregard can damage the A/C Service unit or the A/S System in the car!

Layout drawing

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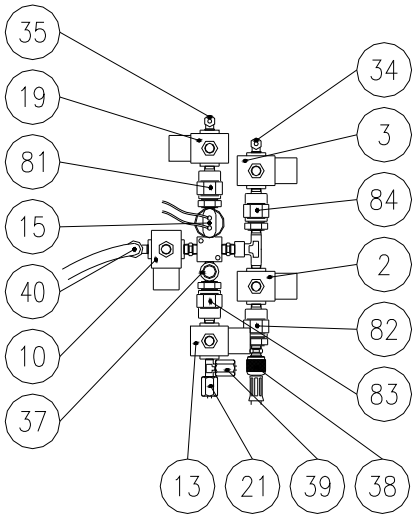
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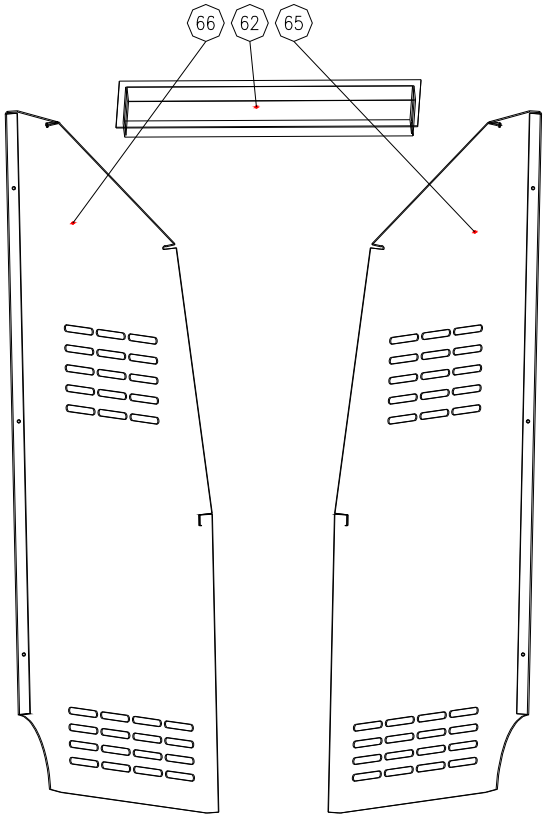
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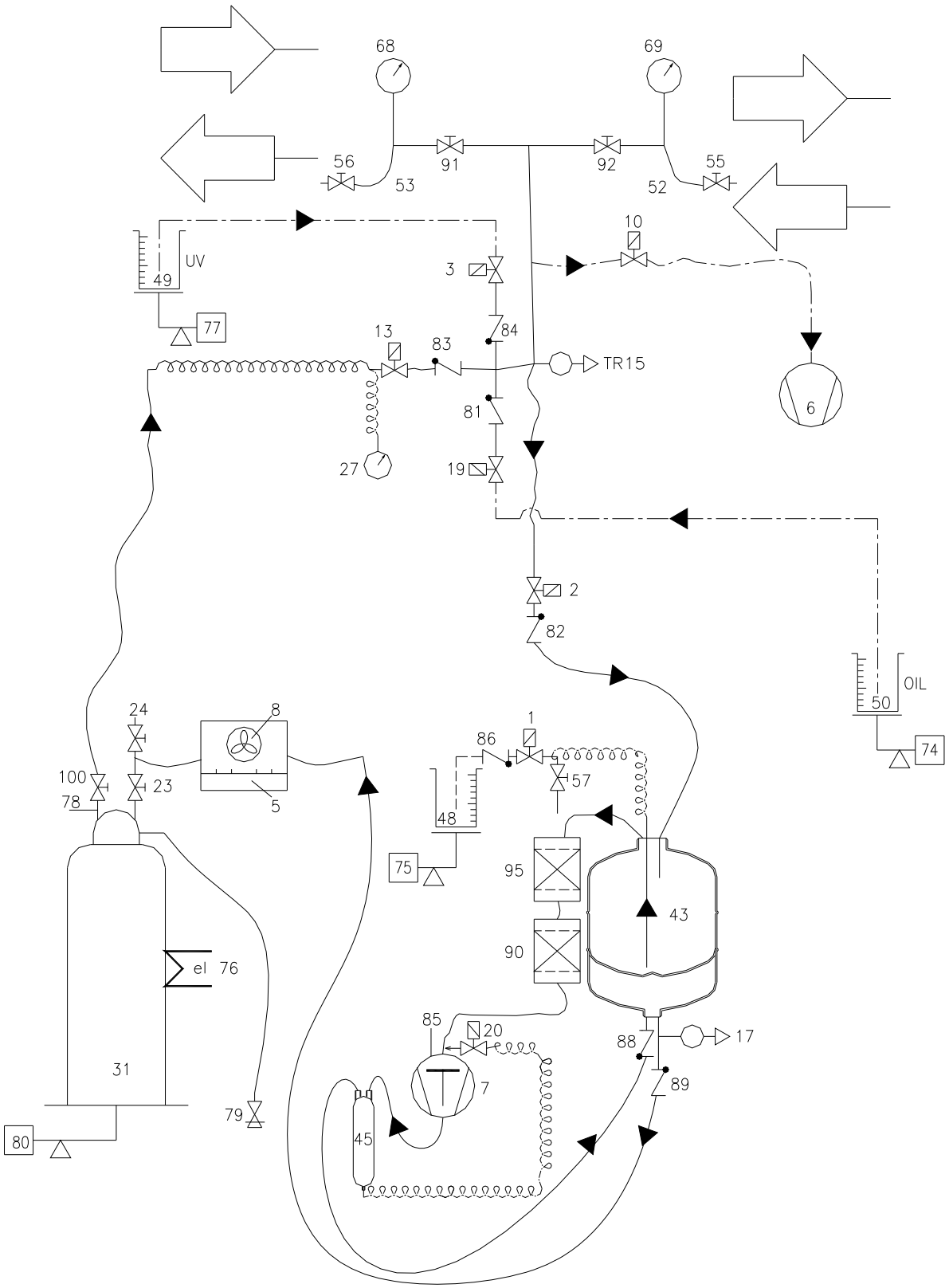
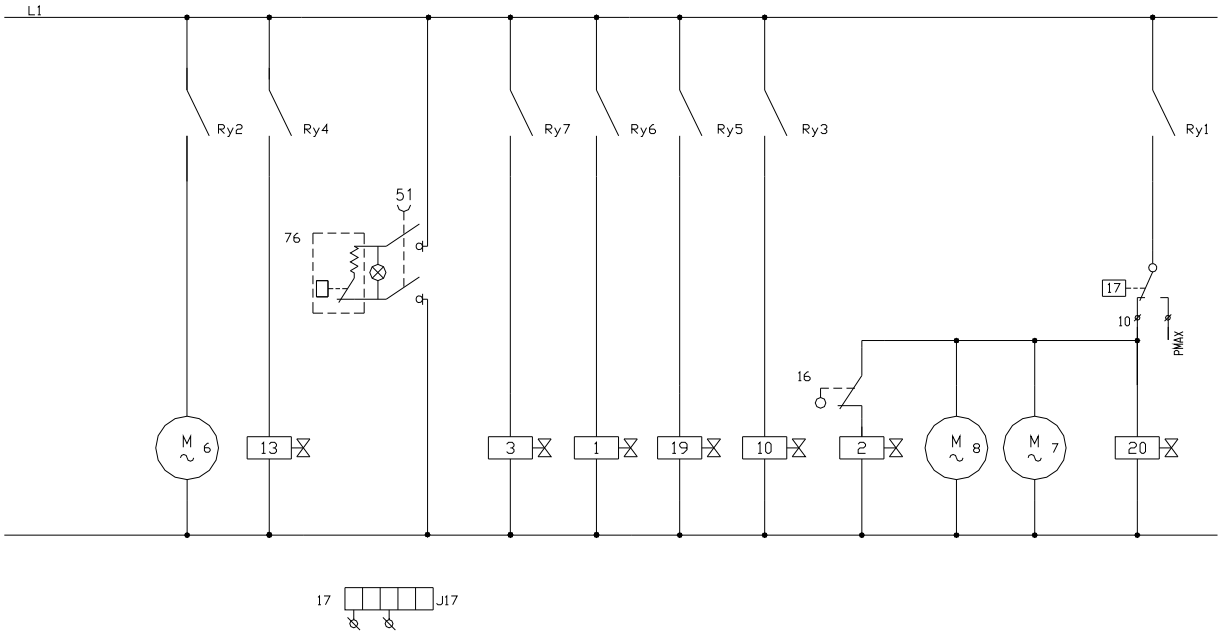
Hydraulic diagram



Electric scheme



Legend

1 - EV1	Solenoid valve on oil draining line	48	Oil drain bottle
2 - EV2	Solenoid valve on recovery line	49	UV dosimeter
3 - EV3	Solenoid valve on UV charging line	50	Oil dosimeter
20 - EV20	Solenoid valve on oil return line to compressor	51	Heater switch
4 - EV4	Solenoid valve on vacuum pump suction line	52	High pressure service hose
10 - EV10	Solenoid valve on vacuum test line	53	Low pressure service hose
13 - EV13	Solenoid valve on refrigerant charging line	54	Main power cable
19 - EV19	Solenoid valve on oil charging line	55	High pressure connection valve
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15	Pressure / vacuum switch	66	Left panel
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18	Vacuum switch	69 - M2	High pressure gauge
19	Up/Down button	70	Connecting hose – manifold and LOW hose
21	Refrigerant charging capillary tube	71 - PRT	Printer
22	Menu button	72 - MC	Memory card
23	Valve on the refrigerant bottle	73	Connecting hose – manifold and HIGH hose
24	Bottle service valve	74– CEL3	OIL injection load cell - 5kg
26	Start/Stop button	75– CEL2	OIL drain load cell - 5kg
27	Bottle pressure gauge	76 - R14	Heater on the refrigerant bottle
28	Display	77– CEL4	UV injection load cell - 5kg
29	Oil drain capillary tube	78 - S2	Refrigerant bottle service connection
30	Condenser/bottle tube	79 - VS1	Safety valve – non condensable gases
31	Refrigerant bottle	80– CEL1	Load cell - 100kg
32	Rotating wheel	81 - CV5	Check valve on oil charging line
33	Main wheel Ø200	82 - CV1	Check valve on recovery suction line
34	UV injection capillary tube	83 - CV3	Check valve on refrigerant charging line
35	Oil injection capillary tube	84 - CV6	Check valve on UV charging line
36	Safety valve capillary hose	85 - S1	Compressor service connection
37	Manifold hose	86 - CV4	Check valve on oil draining line
38	Distiller suction line hose	88 - CV2	First check valve on compressor discharge line
39	Bottle pressure gauge capillary tube	89 – CV7	Second check valve on compressor discharge line
40	Vacuum tube	90 - F2	Filter drier
41	Compressor suction side hose	91	Manual valve – LOW line
42	Distiller-filter hose	92	Manual valve – HIGH line
43	Distiller - separator	93	LP gauge connection capillary tube
44	F1/F2 double nut	94	HP gauge connection capillary tube
45	Compressor lubricant distiller	95 - F1	Filter drier
46	Distiller/condenser hose	98	Enter button
47	Handle support	100	Valve on the refrigerant bottle in charging line

1 Introduction to Coolius-2000 recovery unit

Coolius-2000 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.

Coolius-2000 unit permits the control of all the functions by means of 4 electronic scales, which control respectively: oil discharged from the A/C system, refrigerant charge, oil charge and additive charge.

1.1 Technical specifications

Coolius-2000	
refrigerant	R134a
Maximum storage capacity	20kg/27 litre
Refrigerant reserve	2 kg
Maximum recovery rate	0,4 kg/min
Oil maximum capacity	200 g
Oil reserve	30 g
Additive maximum capacity	200 g
Additive reserve	30 g
Power supply	230/1/50
Power input	700 W
Storage temperature	-10 ÷ +50 °C
Ambient temperature	0 ÷ 40 °C
Degree of protection	IP24
Noise level	< 70dB (A)
Maximum refrigerant charge	The maximum refrigerant quantity available for charging is calculated by subtracting 2 kg from the weight of the refrigerant contained in the bottle and indicated on the display.

max kg for charging = kg in bottle - 2 kg

Model	Connections
Coolius-2000	3/8" sae with quick coupler valves

2 Components description and standard equipment

2.1 High vacuum pum

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	20
Weight of empty bottle	kg	12

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 heater belt with thermostat.

2.3 Destiller -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

2.4 Compressor

The compressor is of the hermetic type.

2.5 Filter

Each anti-acid filter drier has a water absorption capacity of 40 g.

2.6 Flexible hoses

Their flexibility assures easy connection in any situation. They withstand A/C system operating pressures and maintain their passage section even when operating in vacuum.

Coolius-2000 unit features hoses with quick coupler valves.

2.7 Quick coupler valves

Mounted on the hose ends and provided with a coloured operating ring (blue = low pressure, ref. 56; red = high pressure, ref. 55) for quick identification.

2.8 Printer

The printer allows printing a report with the values programmed by the operator and executed by the unit, with the possibility to re-print the report. Please take the paper (item. no. 0764 95 002) for replacement.

2.9 Temperature probe

The unit is equipped with a temperature probe (with range from -10°C to +50°C), which allows to check the ambient temperature at any time. The probe is equipped with a 6 mt long cable.

2.10 Control module

When the unit is turned on (67 switch to position I), the display shows:

- The quantity in kg of refrigerant container in the bottle (see 1.1 "Technical specifications")
- The quantity (in grams) of oil contained in the container
- The quantity (in grams) of additive contained in the container
- The temperature of the probe connected to the equipment

Thanks to the microprocessor and the 3 electronic scales, Coolius-2000 unit is completely computerized and controlled by means of the keyboard located on the upper panel.

Coolius-2000 unit is provided with a large size display to allow for good reading even with bad illumination; the 4-line display (with 20 characters each) allows the reading of the parameters connected to the selected function and, if necessary, it indicates the operating or functioning alarms.

2.11 Functions programming

By pressing the function keys, the display will show the screen where you can modify the values. The display gives all necessary explanations to be able to perform this operation.

The values can be modified by means of the number keyboard (and in this case, the value entered must be confirmed with the ENTER key) or of the UP/DOWN keys. In both cases, after modification, the display will indicate the key to press in order to start the function .

It is possible to modify the refrigerant charge by means of the keyboard or using the DATABASE of the unit.

2.12 Functions that can be performed

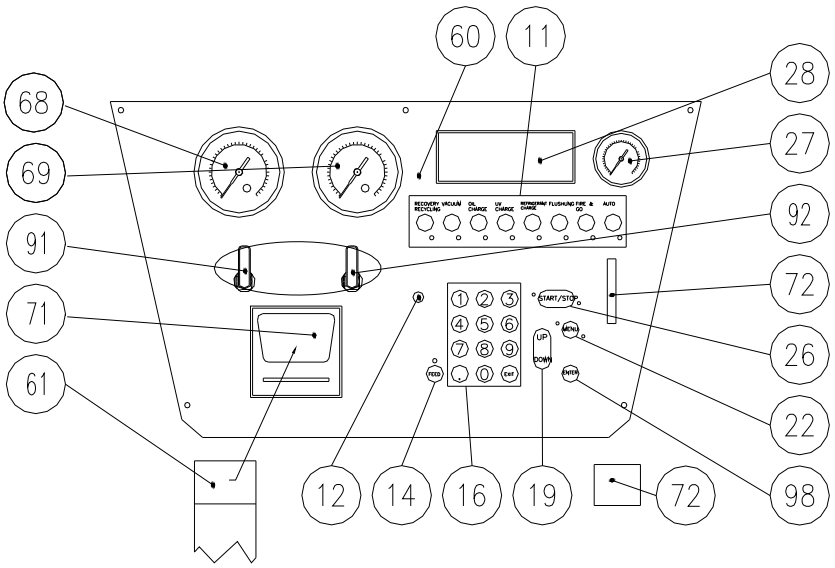
1. Coolius-2000 unit allows to perform the functions singly one after the other, being able to modify the relevant values and to select the working line: only LOW, only HIGH or both.
2. Coolius-2000 unit allows to have a completely automatic programme, called AUTO, controlled by the operator, with the following functions
   - Ref. RECOVERY
   - RECOVERY TEST
   - DISCHARGE of OIL recovered from the system
   - VACUUM and VACUUM TEST

- OIL CHARGE
- UV CHARGE
- REFRIGERANT CHARGE

3. If the operator does not want to perform a function, he must set a value of 0.0 during programming.
4. Coolius-2000 unit allows having a programme called **FIRE & GO**, with which the unit will perform automatically the same functions as the ones in the AUTO programme; the only exception is that only the refrigerant charge value can be modified.
5. Coolius-2000 unit allows performing the A/C system flushing with R134a. By pressing the **START** key, the unit will perform the following functions automatically:
   - VACUUM and VACUUM TEST (this function is performed only at the first cycle)
   - SYSTEM FLOODING
   - REFRIGERANT RECOVERY
   - OIL DISCHARGE (this function is performed at the first and last cycle)
6. Should there be an alarm signal during any automatic or single function, the function will stop and the alarm message will be stored on the display.

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.



3.1 DESCRIPTION OF THE CONTROLE KEYS

- **(11)**: when pressed, they enhance the function to perform or to modify. From the left, you will find the following functions: RECOVERY/RECYCLING, VACUUM, OIL CHARGE, UV CHARGE, REFRIGERANT CHARGE, FLUSHING, FIRE&GO, AUTO
- The numeric keys **(16)** allow modifying the values of the functions to perform.
- The **UP / DOWN** key **(19)** allows to modify the values of the functions to perform.
- The **ENTER** key **(98)** must be used to confirm the modified values.
- The **MENU** key **(22)** is used to see the pages of the unit's inside values on the display **(28)**:
  - PRINT PLATE: by typing the car's number plate on the numeric keys **(16)**, the number plate will be printed on the report at the end of the functions.
  - LANGUAGE: it is possible to modify the unit's language, by typing the corresponding number appearing on the display.
  - DATABASE UPDATE: allows updating data.
  - DATE AND HOUR: allows modifying the date and hour mentioned on the printed report.

- SCALES CALIBRATION: must be used each time the operator wants to re-calibrate one of the four scales.
- SERVICE: inside constants for service personal (protected by PASSWORD)

1. PASSWORD 2006 allows to modify the print heading of the report.

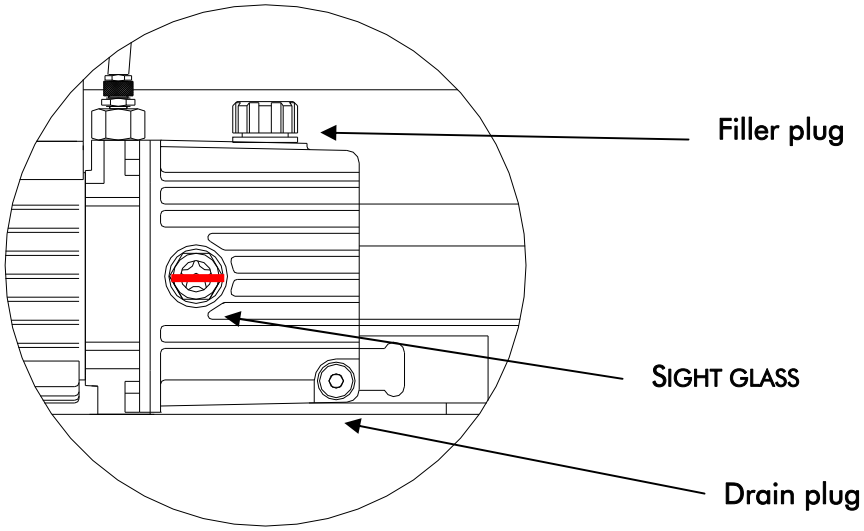
- **START/STOP** key, ref. **26:** used to start or stop the unit's functions
- **(72)**: space used for the introduction of the MEMORY CARD
- **(92)**: high pressure valve
- **(91):** low pressure valve
- **(68)**: Low pressure gauge
- **(69)**: High pressure gauge
- **(27)**: pressure gauge for pressure inside the bottle
- **FEED (14)**: used to reprint the final report
- **(12):** alarm LED that lights up every time a function or a value are not regular
- **(71)**: Printer
- **C/EXIT** used to exit from the programming and to cancel
- **(60):** Electronic card on control panel
- **(61):** Paper roll

4 Preparing the unit Coolius-2000 for the 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

Before checking the oil level, the unit must be placed on a level surface and its power supply must be turned off. Check that the vacuum pump oil level covers half of the sight glass. For filling, use the vacuum pump oil (item.-no. 0892 764 300).



4.2 "Zero" scale check

⚠ *ATTENTION!*
Incorrect executed scale check could implicate failure functionality of the A/C Service unit

After having unlocked the scale:

1. Connect the unit to the power supply.
2. Turn the 67 switch to position 1.
3. Preparation:
4. Make sure that the bottle, oil charge dosimeter, oil discharge dosimeter and uv charge dosimeter are empty
5. Make sure that the A/C Service unit to be located on flat surface during the scale check.
6. Wait at least 5 minutes so that the bottle/scale assembly stabilizes before proceeding; The display must show a value between 0.000 e 0.050. If the value of the scale is lower or higher than the above indicated one, the scale must be reset by acting on the electronic control module as follows:
7. Press the MENU key: the screen with the different functions that can be performed will appear on the display.
8. Press the 7 key "Service" and digit the password 9376
9. At the end of the re-calibration operations, press  to exit.

4.3 Filling refrigerant into the bottle

When all the above mentioned preliminary operations have been performed, the recommended quantity of about 6÷ 7 4-DATA ,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

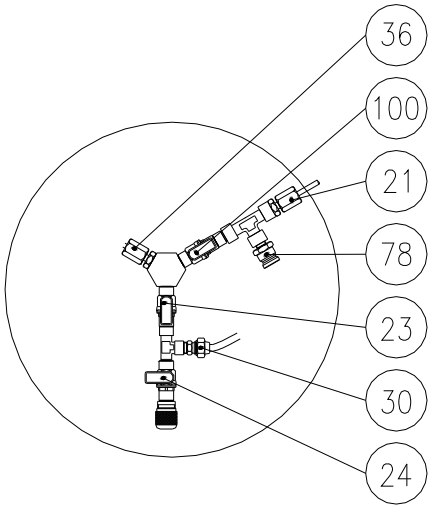
4.3.1 Filling refrigerant into the internal bottle by means of recovery from the service bottle

1. Connect the unit to the power supply
2. Turn the **67** switch on position **0**
3. Position the service bottle so that liquid refrigerant will come out (bottle with tube upright, bottle without tube upside down)
4. Use the adapter (0764 000 003) and mount it on the bottle.
5. Connect the low quick coupler valve (blue) to the adapter screwed on the service bottle.
6. Do not open the valve of the service bottle.
7. Turn the **67** switch to position **I**
8. Press the **VACUUM** key  . The led of the function starts blinking: the **set vacuum time** appears on the display . Modify the value by means of the UP/DOWN keys  or of the keypad and confirm with 
9. Press  in order to start the vacuum cycle. The display will show:
   - VACUUM TIME
   - REMAINING TIME
10. Leave the vacuum pump running for about 5 minutes
11. After 5 minutes, press  to stop the pump; press  again to exit from the **Vacuum Test** function.
12. Press any key to return to the initial screen or press  to print the report of the function.
13. Open the **LOW** valve **(91)**
14. Press the **RECOVERY** key  . The led of the function starts blinking: the following will appear on the display:
   - RECOVERY ALL
   - MAX RECOV. 12.000 (hypothetical value)
15. By means of the **UP/DOWN keys**  or with the keypad**,** set **6.000**, this is the refrigerant quantity in kg that will be transferred into the unit's bottle. Slowly open the valve of the bottle.
16. Press  to start recovery; the unit will stop automatically as soon as the previously set quantity has been transferred into the unit's bottle.
17. Close the valve of the service bottle.
18. Press the **RECOVERY** key  The led of the function starts blinking: the following will appear on the display:
   - RECOVERY ALL
   - MAX RECOV. 12.000 (hypothetical value)
19. Modify the value by means of the UP/DOWN keys  or of the keypad and confirm with 

20. Press  to start recovering the refrigerant inside the hose and wait for the automatic stop of the recovery unit.
21. Press  twice to exit from the **RECOVERY** function.
22. Press any key to return to the initial screen or press  to print the report of the function.
23. Disconnect now the low quick coupler valve from the service bottle.
24. Press the **VACUUM** key  , the led of the function starts blinking): the **set vacuum time** appears on the display. Modify the value by means of the UP/DOWN keys  or of the keypad and confirm with 
25.
26. Press  in order to start the vacuum cycle. The display will show:
    - VACUUM TIME
    - REMAINING TIME
27. Leave the vacuum pump running for about 5 minutes. After 5 minutes, press  to stop the pump; press  again to exit from the **Vacuum Test** function.
28. Press any key to return to the initial screen or press  to print the report of the function. Turn the **67** switch to position **0** if the unit will not be used immediately..

4.3.2 Emptying the internal bottle

1. Make a vacuum in an external bottle able to contain the refrigerant there is in the internal bottle.
2. Remove the unit's metal cover.
3. Connect the HIGH quick coupler hose (55)to the (78) service connection situated on the bottle.
4. By means of the service hose (not supplied with the unit), connect the valve of the external bottle (previously evacuated) to the (24) valve of the internal bottle and close the (23) valve.
5. Open the (24) valve and the valve on the external bottle.
6. Open the HIGH valve on the control panel (92).
7. Start the automatic Recovery function (select ALL) to empty the internal bottle completely.
8. Recovery stops automatically.
9. Close the (24) valve and the valve on the external bottle and disconnect the service hose.
10. Connect the LOW quick coupler hose (56) to the (85) compressor service connection and open the (91) LOW valve on the control panel.
11. Start the vacuum and vacuum test function for about 30 minutes.
12. At the end of the Vacuum and Vacuum test function, disconnect the HIGH quick coupler valve hose (55) from the (78) service connection and proceed with the scale calibration.
13. At the end of operations, open again the (23) valve and remount the cover.



5 Recovery 

When the Recovery function has been started, it will only last max. 60 minutes. In case the pre-set quantity of refrigerant has not been recovered within 60 minutes, the unit will stop automatically and the alarm message will appear 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.

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

5.2 Recovery = all

This function allows the total recovery of the refrigerant. The unit automatically stops, when the A/C system reaches a residual internal pressure of -0,4 bar.

1. Turn the **67** main switch on position **0**
2. Connect the LOW quick coupler valve **(56)** to the A/C system low pressure service connection.
3. Connect the HIGH quick coupler valve **(55)** to the A/C system high pressure service connection.
4. Turn the power on by turning the **67** main switch to position **I**.
5. Open the LOW **(91)**, HIGH **(92)** or both valves
6. Press the **RECOVERY** key  (the led of the function starts blinking): the following will appear on the display:
   - RECOVERY ALL
   - RECOV. MAX 12.000 hypothetical value
7. Press 

: the unit starts refrigerant recovery, the led of the **RECOVERY** key is on and the display shows:
8. the refrigerant quantity that is being recovered
9. the refrigerant contained in the stocking bottle
10. the number of recovery cycles performed
11. If there is no refrigerant, the function will not be activated and the alarm message will appear on the display.
12. At the end of recovery, the unit stops automatically and waits for 1 minute.
13. If during this 1 minute the pressure inside the A/C system rises beyond 0,6 bar, the unit will automatically start another recovery cycle
14. The unit will perform maximum 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 alarm message will be displayed
15. If after the 1 minute the pressure does not rise beyond 0,6 bar, the unit will automatically stop and will automatically start the oil discharge and the screen corresponding to the function will be displayed
16. At the end of the function, the summarizing screen will appear on the display:
    - RECOVERED REFRIGERANT
    - OIL DISCHARGED
17. At the end of the function, the unit will print a report (the print can be repeated)

⚠ *WARNING!*
The bottle of the recovery unit has a maximum capacity of 20 kg of refrigerant.
If the maximum level is reached during recovery (the alarm message 20.00 appears on the display), the unit will stop automatically. Transfer the refrigerant from the bottle to a suitable external tank (see procedure at 4.3.2).

⚠ *WARNING*
When the functions have come to an end, the unit goes back to the summarizing screen. Press any key to exit and return to the initial screen or press the  key to print the report of the function.

5.3 Refrigerant recovery of a definite refrigerant quantity

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

1. Turn the **67** main switch on position **0.**
2. Connect the LOW quick coupler valve **(56)** to the A/C system low pressure service connection.
3. Connect the HIGH quick coupler valve **(55)** to the A/C system high pressure service connection.

4. Turn the power on by turning the **67** main switch to position **I.**
5. Open the LOW **(91)**, HIGH **(92)** or both valves
6. Press the **RECOVERY** key  (the led of the function starts blinking)and
7. the following will appear on the display:
   - RECOVERY ALL
   - RECOV. MAX 12.000 hypothetical value
8. By means of the numeric keys or the UP and DOWN keys  , select the quantity of refrigerant to recover.
9. Press  to store the value set with the numeric keys.
10. Press  to start recovery; if there is no refrigerant, the function will not be activated and the alarm is displayed.
11. When the preset quantity of refrigerant has been recovered, the unit stops automatically and the quantity of recovered refrigerant is displayed. Press any key to exit from the function and return to the initial screen.

    NB: If during the function the unit stops before having recovered the refrigerant quantity previously selected on the display, the alarm message will be displayed.
12. Disconnect the **(52)** and **(53)** hoses form the A/C system
13. Press the **RECOVERY** key  , the led of the function starts blinking and the
14. following will appear on the display:
    - RECOVERY ALL
    - RECOV. MAX 12.000 hypothetical value
15. Press  , the unit starts recovery, the led of the **RECOVERY** key is on and the display shows:
    - RECOVERY
    - R134a refrigerant quantity that is being recovered
    - R134a refrigerant quantity contained in the bottle
    - number of recovery cycles performed
16. At the end of recovery, the unit stops automatically and waits for 1 minute .
17. If during this 1 minute the pressure inside the A/C system rises beyond 0,6 bar, the unit will automatically start another recovery cycle
18. The unit will perform maximum 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 alarm message will be displayed
19. If after the 1 minute the pressure does not rise beyond 0,6 bar, the unit will automatically stop and will automatically start the oil discharge and the screen corresponding to the function will be displayed
20. At the end of the function, the summarizing screen will appear on the display:
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21. At the end of the function, the unit will print a report (the print can be repeated.

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If the maximum level is reached during recovery (the alarm message 20.00 appears on the display), the unit will stop automatically. Transfer the refrigerant from the bottle to a suitable external tank (see procedure at 4.3.2)

⚠ *WARNING!*
When the functions have come to an end, the unit goes back to the summarizing screen. Press any key to exit and return to the initial screen or press  to print the report of the function.

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

At the end of RECOVERY, the draining of the oil extracted from the A/C system will automatically be effected into the graduated bottle (48). The operator will then have to write down the quantity of drained oil, which must be recharged afterwards.

⚠ *WARNING!*
Do not pollute environment with oil ; it is a special waste and must be disposed of according to the regulation 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 level after this operation indicates that there are air infiltrations which would turn into refrigerant leaks after having charged the A/C system.

1. Make sure that all valves on the control panel are closed and that the **67** switch is in position **0.**
2. Connect the LOW quick coupler valve **(56)** to the A/C system low pressure service connection.
3. Connect the HIGH quick coupler valve **(55)** the A/C system high pressure service connection.
4. Turn the **67** switch to position **I.**
5. Open the LOW **(91)**, HIGH **(92)** or both valves
6. Press the **VACUUM** key  (the led of the function starts blinking) and
7. the **set vacuum time** appears on the display
8. Modify the values with the UP and DOWN keys  or numerical keys. Confirm with 
9. Press  to start the vacuum cycle while the display will show:
   - VACUUM TIME
   - REMAINING TIME
10. Check on the display that the remaining time value is not blinking and that the countdown starts within 5-10 minutes; if this is not the case, stop evacuation and find the leak in the circuit.
11. When the pre-set time is over, the function will stop automatically and the **Vacuum test** will start for 3 minutes.
12. If the **Vacuum Test** function ends without having displayed any message, it means that the system evacuation came to a successful conclusion and the system is ready to perform the charge; on the contrary if, during the 3 minutes of **Vacuum Test** the alarm message appears on the display; it means that there are leaks in the circuit, which must be found and repaired.

⚠ *WARNING!*
When the functions have come to an end, the unit goes back to the summarizing screen. Press any key to exit and return to the initial screen or press the  key to print the report of the function.

8 Refilling oil into the A/C system 

After A/C system evacuation and before refrigerant charging, the unit will perform automatically the oil charge that was set previously (see 8.3)

⚠ *WARNING*
Lubricant (PAG-Oil) 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.

⚠ *WARNING!*
Before performing an oil charge, check that there is a higher quantity of oil in the graduated bottle (50) than the one needed for the charge. N.B. the oil quantity available to perform the charge is equal to the contents of the graduated bottle minus 30g of safety spare. Qoil charge = Q in the bottle – 30g

1. Oil refilling procedure in the A/C system
2. Turn the **67** switch on **I.**
3. Open the LOW **(91)**, HIGH **(92)** or both valves
4. Press the **OIL CHARGE** key  (the led of the function starts blinking) und the following will appear on the display:
   - OIL CHARGE 30 g
   - MAX CHARGE 120 g (hypothetical value)
   - OIL RECOVERED 0 g
5. If the operator does not want to refill oil into the system, set a value of 0.00 on the display (to modify the set values – see 2.10 "Control module").
6. Press  : the unit starts the oil charge, the led on the **OIL CHARGE** key is on and the display shows:
   - OIL CHARGE
   - OIL
   - OIL AVAILABLE
7. After having charged the pre-set oil quantity, the function stops automatically and the summarizing screen appears on the display:
   - OIL CHARGE
   - OIL

⚠ *WARNING*
When the functions have come to an end, the unit goes back to the summarizing screen. Press any key to exit and return to the initial screen or press the  key to print the report of the function.

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

8.1 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
Pipelines:	10 cc

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

⚠ *WARNING*

Before performing a UV charge, check that there is a higher quantity of UV in the graduated bottle (49) than the one needed for the charge. N.B. the UV quantity available to perform the charge is equal to the contents of the graduated bottle minus 30g of safety spare. QUV charge = Q in the bottle – 30g.

8.2 UV refilling procedure in the A/C System 

1. Turn the **67** switch on **I.**
2. Open the LOW **(91)**, HIGH **(92)** or both valves
3. Press the **UV CHARGE** key  (the led of the function starts blinking)and the following will appear on the display:
   - UV CHARGE 30 g
   - MAX CHARGE 120 g (hypothetical value)
4. If the operator does not want to refill UV in the system, set a value of 0.00 on the display (to modify the set values use the UP and DOWN keys  or the numerical keys. Confirm with )
5. Press  : the unit starts **UV** charge, the led on the **UV CHARGE** key is on and the display shows:
   - UV CHARGE
   - UV
   - UV AVAILABLE
6. After having charged the pre-set UV quantity, the function stops automatically and the summarizing screen appears on the display:
   - UV CHARGE
   - UV+

⚠ *WARNING!*

When the functions have come to an end, the unit goes back to the summarizing screen. Press any key to exit and return to the initial screen or press the  key to print the report of the function

9 Charging refrigerant into the A/C system 

⚠ *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 4.3" Filling refrigerant into the bottle ").

The quantity of refrigerant available for charging is equal to the refrigerant in the bottle minus 2Kg (Qcharge = Qin bottle - 2Kg).

9.1 A/C system refrigerant charging procedure

1. Turn the **67** switch on **I**
2. Open the LOW **(91)**, HIGH **(92)** or both valves
3. Press the **REFRIGERANT CHARGE** key  (the led of the function starts blinking and the following screen will appear on the display:
   - R134 CHARGE 1.550
   - MAX CHARGE 15.500 hypothetical value
4. To modify the set values use the UP and DOWN keys  or the numerical keys. Confirm with 
5. Press  : the unit will start to pre-charge the hoses and the current function will be displayed.
6. At the end, the unit will start to charge REFRIGERANT, the led on the **REFRIGERANT CHARGE** key is on and the display shows::
   - R134a CHARGE
   - R134a
   - R134a AVAIL.
7. After the pre-set refrigerant quantity has been charged, the function stops automatically and summarizing screen appears on the display:
   - R134a CHARGE
   - R134a.

10 Checking the A/C system operating pressures

1. Make sure that the LOW (91) and HIGH (92) valves are closed and start the motor and turn the A/C system
2. Wait a few minutes to enable the pressures to stabilize.
3. Make sure that values of the pressures correspond to those supplied by the A/C system manufacturer A/C (see our a/c-handbooks).

11 FLUSHING automatic function 

This operation allows flushing (with R134a) any A/C system.

The FLUSHING automatic function will perform: a VACUUM and VACUUM TEST cycle from both lines, a FLOODING cycle only from the HIGH pressure line, a RECOVERY cycle only from the LOW pressure line and an OIL DISCHARGE cycle. These functions will be repeated according to the number of cycles set.

4. Make sure that the **67** switch is on I
5. Open the LOW (**91**), HIGH (**92**) or both valves
6. **FLUSHING** function (the led of the function starts blinking); the following will appear on the display:
   - NR. CYCLES 3 programmable value
   - VACUUM TIME 30' programmable value
   - R134a DISP. 12.000Kg. (hypothetical value)
7. To modify the set values use the UP and DOWN  keys or the numerical keys. Confirm with 
8.
9. Press  : the unit will start the VACUUM cycle and the display will show:
   - VACUUM TIME
   - REMAINING TIME
10. At the end of VACUUM and **VACUUM** TEST, the A/C system will be flooded automatically and the display will show:
    - SYSTEM FLOODING
11. The function will stop when the system to be flushed will be completely flooded.
12. After the FLOODING cycle, the unit will perform a RECOVERY/RECOVERY TEST/OIL DISCHARGE cycle.
13. The cycle will be repeated according to the number of cycles previously set..

12 FIRE&GO automatic function 

FIRE&GO function is a pre-set function which allows performing an automatic and complete cycle of all the functions at the values pre-set by default. It is possible to modify only the value of the refrigerant charge. This helps saving time.

1. Turn the **67** switch is on **I**.
2. Open the LOW **(91)**, HIGH **(92)** or both valves
3. Press the **FIRE&GO** key  (the led of the function starts blinking and the screen for the modification of the refrigerant quantity appears on the display
4. To modify the set values use the UP and DOWN  keys or the numerical keys. Confirm with 
5. Press  to start the function.
6. At the end of the function, the report will be printed.
7. Should there be an alarm signal during the automatic function, the unit will stop at the relevant function and indicate the alarm.

13 AUTO automatic function 

The AUTO function allows the operator to build a personalized program, by setting the values of the functions. The functions are then performed automatically. The values introduced in the AUTO function will be stored by the unit until next modification.

1. Turn the **67** switch is on **I.**
2. Press the **AUTO** key 

: (the led of the function starts blinking and the following appears on the display:
   - Recovery R134 programmable
   - VACUUM programmable
   - OIL programmable
   - UV programmable
   - R134a programmable
3. In order to program each function of the AUTO cycle, press the key of the single function and modify as in the manual cycle. Confirm with 

4. Press 

to perform an automatic and complete cycle of all programmed functions.
5. At the end of the AUTO function, the unit will print the report.
6. Should there be an alarm signal during the automatic function, the unit will stop at the relevant function and indicate the alarm.

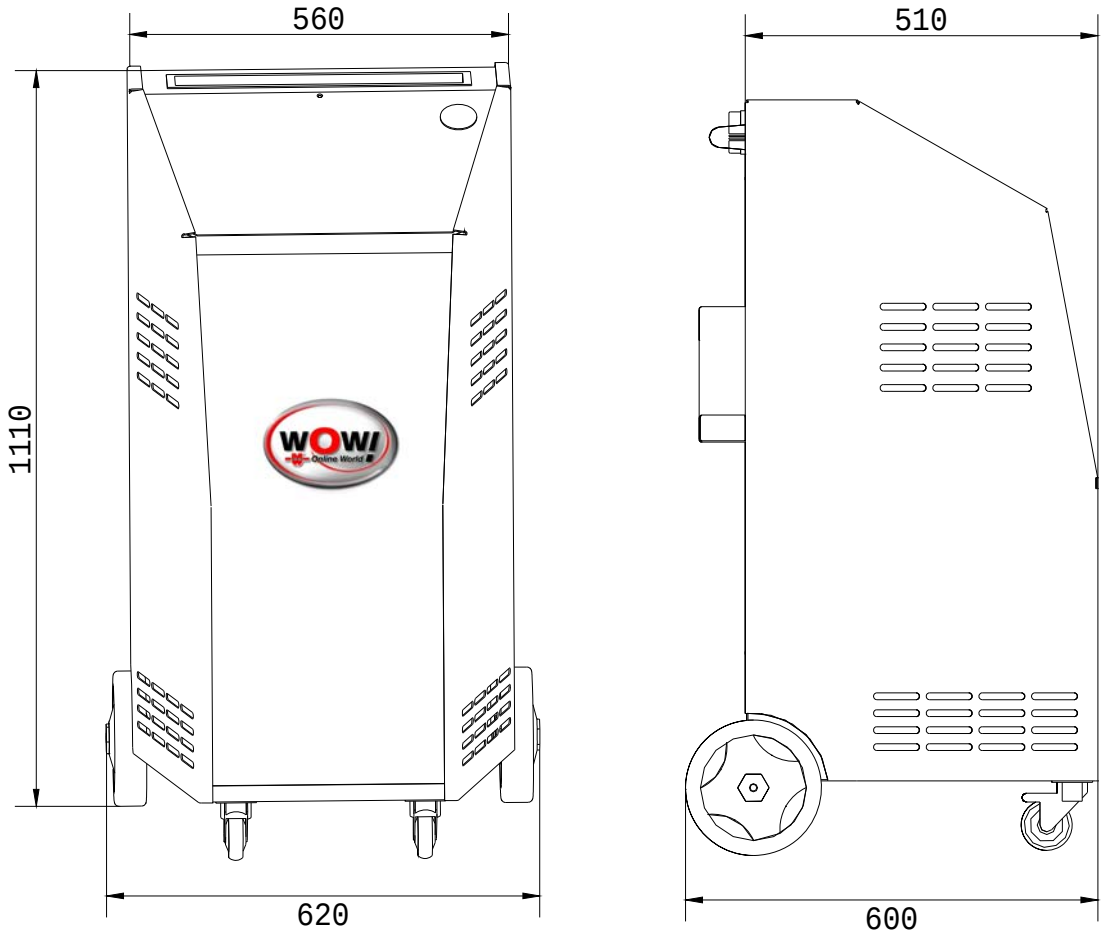
14 Operations before disconnecting the unit from the A/C system

1. With the A/C system compressor on, disconnect the **T2** hose.
2. Press the **START** key for more than 4 seconds in order to open the LOW and HIGH inlet solenoid valves; the led of the STOP key will light and the following writing will appear on the display:
   DISCONNECTING MODE - LOW AND HIGH VALVES OPEN
3. As soon as the pressures on the high and low pressure gauges are the same and do not exceed 2÷3 bar, press the **STOP** key (the led will remain on, and also the led of the **START** key will light); the following writing will appear on the display:
   DISCONNECTING ENDED - LOW AND HIGH VALVES CLOSED
4. Disconnect the **T1** hose from the A/C system
5. Perform a recovery cycle to extract the remaining refrigerant from the hoses, so that the unit is immediately ready for the next operation.
6. Turn the unit off (**67** power switch on **0**).
7. Reposition both service hoses in their supports.
8. Carefully screw the protection caps on the A/C system service valves.
9. Carefully check the A/C system for leaks by means of a leak detector.

The introduction of tracer 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

⚠ *WARNING!*
If, after having pressed the STOP key, pressure should rise, it is possibile to press again the START key in order to resume the DISCONNECTING function.

15 Dimensions and weight



Net weight with empty internal bottle: 90 kg

16 Additional information to Air-condition database

International Offices

GERMANY
WOW! Würth Online World GmbH
Schliffenstraße Falkhof
74653 Künzelsau
☎ +49 (0) 7940/15-1770
🖷 +49 (0)7940/15-3299
Kfz-Technik-Hotline:
☎ 0180 / 5005078
e-Mail: info@wow-portal.com
http://www.wow-portal.com

AUSTRIA
Würth Handelsgesellschaft m.b.H.
Würth Straße 1
3071 Böheimkirchen
AUSTRIA
☎+43 5 08242 0
🖷+43 5 08242 5 33 33
e-Mail: info@wuerth.at
http://www.wuerth.at

BELGIUM
Würth België N.V.
Everdongenlaan 29
2300 Turnhout
☎+32 14 445 566
🖷+32 14 445 567
e-Mail: info@wurth.be
http://www.wurth.be

BOSNIA AND HERZEGOVINA
WURTH BH d.o.o.
Binjezevo bb
71240 Hadzici, BiH
☎ +387 33 775 000
🖷 +387 33 775 019
e-Mail: info@wurth.ba
http://www.wurth.ba

BULGARIA
Würth Bulgarien EOOD
Mladost 4
Business Park Sofia 1
1715 Sofia
☎+359 2 965 99 55
🖷+359 2 965 99 66
e-Mail: office@wuerth.bg
http://www.wuerth.bg

CROATIA
Würth-Hrvatska d.o.o.
Franje Lucica 23/III
10000 Zagreb
CROATIA
☎+385 1 349 87 84
🖷+385 1 349 87 83
e-Mail:
wurth.hrvatska@wuerth.com.hr
http://www.wuerth.com.hr

CYPRUS
Wurth Cyprus Ltd.
4, Vitona Str.
2033 Strovolos Industrial Estate
2083 Lefkosia
☎+357 22 512 086
🖷+357 22 512 091
e-Mail:
wuerthcy@cytanet.com.cy

CZECH REPUBLIK
Würth, spol. s r.o.
Prumyslová zóna
Neprevázka 137
29301 Mladá Boleslav
☎+420 326 345 111
🖷+420 326 345 119
e-Mail: info@wuerth.cz
http://www.wuerth.cz

DENMARK
Würth Danmark A/S
Montagevej 6
DK-6000 Kolding
☎+45 79 323 232
🖷+45 79 323 242
e-Mail: mail@wuerth.dk
http://www.wuerth.dk

FRANCE
Würth France SA
Z.I. Ouest
Rue Georges Besse - BP 13
67158 Erstein Cedex
☎ +33 3 88 645 300
🖷 +33 3 88 64 60 94
http://www.wurth.fr

Assistance technique WOW!
☎ +33 3 88 64 54 42
du lundi au vendredi
de 8h00 à 12h00 et
de 13h30 à 17h00

GREAT BRITAIN
Würth U.K. Ltd.
1 Centurion Way
Erith
Kent DA 18 4 AE
☎+44 208 319 60 00
🖷+44 208 319 64 00
e-Mail: info@wurth.co.uk
http://www.wurth.co.uk

GREECE
Würth Hellas S.A.
23rd Klm. National Road
Athens-Lamia
145 68 Krioneri
☎+30 210 6 290 800
🖷+30 210 8 161 691
e-Mail: info@wurth.gr
http://www.wurth.gr

HUNGARY
Würth Szereléstechnika KFT
Gyár utca 2
2040 Budaörs
☎+36 23 418 130
🖷+36 23 421 777
e-Mail: wuerth@wuerth.hu
http://www.wuerth.hu

IRELAND
Würth Ireland Ltd.
Monaclinoe Industrial Estate
Ballysimon Road
Limerick
☎+353 61 430 200
🖷+353 61 412 428
e-Mail: cs@wuerth.ie
http://www.wuerth.ie

ISRAEL
Würth Israel Ltd.
Hatohen 2
Zone 34
Caesarea Industrial Park
P.O. Box 3585
☎+972 4 632 88 00
🖷+972 4 627 09 99
e-Mail: wurth@wurth.co.il
http://www.wurth.co.il

ITALY
Würth S.r.l.
Bahnhofstraße 51
39044 Neumarkt (BZ)
☎ +39 0471 828 111
🖷 +39 0471 828 600
e-Mail: vendite@wuerth.it
http://www.wuerth.it

Assistenza WOW!
☎ +39 0471 827 789

MACEDONIA
Wuerth - Macedonia d.o.o.e.l.
ul. Prvomajska b.b.
1000 Skopje
☎+389 2 272 80 80
🖷+389 2 272 88 72
e-Mail: contact@wurth.com.mk
http://www.wurth.com.mk

NETHERLANDS
Würth Nederland B.V.
Het Sterrenbeeld 35
5215 MK 's-Hertogenbosch
Postbus 344
5201 AH 's-Hertogenbosch
☎+31 73 6 291 911
🖷+31 73 6 291 922
e-Mail: info@wurth.nl
http://www.wurth.nl

NORWAY
Würth Norge AS
Morteveien 12,
Gjellerasen Naeringspark
1481 Hagan
☎+47 464 01 500
🖷+47 464 01 501
e-Mail: kontakt@wuerth.no
http://www.wuerth.no

POLAND
Würth Polska Sp. z o.o.
u. Plochocinska 33
03-044 Warszawa
☎+48 22 5 102 000
🖷+48 22 5 102 001
e-Mail: biuro@wurth.pl
http://www.wurth.pl

SERBIA
Wurth d.o.o.
Pancevacki put 38
11210 Krnjaca - Beograd
☎+381 11 2 078 200
🖷+381 11 2 078 225
e-Mail: office@wurth.co.yu
http://www.wurth.co.yu

SLOVAKIA
Würth s.r.o.
Pribylinská ul. c. 2
83255 Bratislava 3
☎+421 2 49 201 211
🖷+421 2 49 201 299
e-Mail: wurth@wurth.sk
http://www.wurth.sk

SWITZERLAND
Würth AG
Dornwydenweg 11
4144 Arlesheim
☎+41 61 705 91 11
🖷+41 61 705 94 94
e-Mail: info@wuerth-ag.ch
http://www.wuerth-ag.ch

SOUTH AFRICA
Wuerth South Africa (Pty.) Ltd.
P.O. Box 616
Isando 1600
Johannesburg
☎+27 11 281 1000
🖷+27 11 974 6169
e-Mail: wurthsa@wurth.co.za
http://www.wurth.co.za

TURKEY
Würth Sanayi Ürünleri Tic. Ltd. Sti.
Eski Silivri Caddesi No. 46
34535 Mimarsinan
Büyükcekmece
☎+90 212 866 6200
🖷+90 212 866 84 85
e-Mail: info@wurth.com.tr
http://www.wurth.com.tr