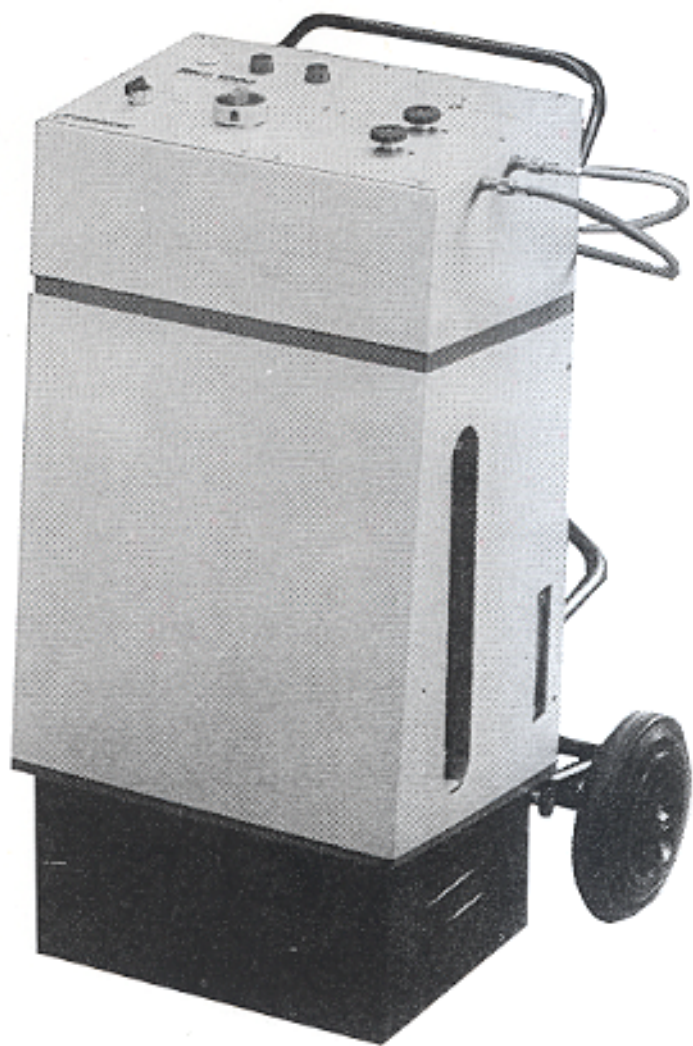


Recovery and reclaim station RHS 1000



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APPLICATION

The RHS 1000 recovery and reclaim station is the ultimate in shop service equipment.

The well-designed unit combines the knowledge gained in the field of handling and reclaiming refrigerants.

RHS 1000 is designed and manufactured to meet specifications better than the SAE-standard using premium components throughout and given proper care, it should provide trouble-free service.

The RHS 1000 is designed to service any car or truck air-conditioner operating with R12.

When connected to the vehicle it will automatically drain (recover) and reclaim (clean) the refrigerant from the air-conditioner. The cleaned refrigerant can be used for charging the air-conditioner in the same or another vehicle.

RHS 1000 cleans the refrigerant automatically. It also includes facility for monitoring the amount of oil that might be drained during the process of recovery from the air-conditioner. This amount has to be added before a following charging of refrigerant takes place.

While RHS 1000 is in operation, built-in devices will continually monitor all procedures and secure the automatic process. Furthermore, it includes safety devices that will stop and signal the faulty process if too high pressure or overfilling of the internal cylinder takes place.

The filtering system is automatic and no frequent exchange of filter cores are necessary.

Venting of non-condensable gases (air) is done automatically, minimizing the release of refrigerant.

Before using the RHS 1000 - read the following instructions carefully.

We reserve the right to make constructional and design changes and can accept no responsibility for printing errors.

SAFETY PRECAUTIONS

1. Always wear protective goggles when working with refrigerant.
2. Do not allow refrigerant to come into contact with your skin. Its very low boiling point can cause frostbite.
3. Before connecting RHS 1000 to a vehicle make certain that the manual shut-off valves are closed.
4. Before disconnecting RHS 1000 make certain that the process is completed to avoid release of refrigerant from the vehicle into the atmosphere.
5. When emptying the reclaimed refrigerant from RHS 1000 into an external refrigerant cylinder, make certain that the manual shut-off valves on both RHS 1000 and the cylinder are completely closed after this operation.
6. Do not expose RHS 1000 to moisture and do not operate it in wet areas.
7. Disconnect power and compressed air supply before attempting to perform any maintenance on RHS 1000.
8. To reduce the risk of fire: Avoid the use of an extension cord because the extension cord may be overheated. However, if you must use an extension cord the cord shall be no less than 2.5 mm².
9. When charging an external cylinder the charging amount must not exceed 80% of the total weight of the cylinder.
10. Remove external cylinder in case of fire.
11. When draining oil from the suction accumulator, it must be filled into a sealed container, immediately. This is because the oil contains R12.

SPECIFICATIONS

Recovery/reclaim system:	
Refrigerant	R12
Recovery (drain) capacity	0.2 to 1 kg/min
Reclaim (cleaning) capacity	4 kg/h (3-5 cars/ hour)
Compressor:	
Power consumption	330 W
Operating amperage	1.9 A
Starting current	11.8 A
Oil level indicator	incl manual drain and scale
Acid filter drier	exchangeable with 3/8 in flare fitting mixture of silicagel, molecular sieves and activated aluminium
Oil separator	incl automatic oil return
Suction accumulator	2.4 l
Internal cylinder:	
Capacity	4.2 kg resolution 50 g on scale
Heating element	125 W
Automatic level control	with signal lamp
Safety valve	mechanical
Venting of non-condensable gases	automatic
External cylinder	can be delivered as accessory

SPECIFICATIONS

In General:

Safety equipment	mechanical safety valve thermostat low-pressure control overcharge safety device fan control suction regulator high-pressure control
Indications on control panel	READY (white lamp) COMPRESSOR ON (green lamp) INTERNAL CYLINDER FULL (red lamp) EXTERNAL CYLINDER FULL (red lamp)
Main switch	
Power supply	220 V/50 Hz
Air supply	5-8 bar - 100 l/min
Fuse	6.3 A
Refrigerant inlet size	1/4 in flare
Refrigerant outlet size	1/4 in flare
Weight	70 kg
Dimensions	1030 x 670 x 800 mm
Code No	02560

The station is built on a mobile steel frame with space for an external cylinder of up to 15-25 kg capacity.

We reserve the right to make technical and design changes on the RHS 1000.

DESCRIPTION

Process description

The refrigerant from the vehicle can be recovered both in liquid and vapour state.

In the suction accumulator, located in front of the compressor, the liquid will be stored and will be evaporated before it is sucked through the compressor.

Furthermore, this accumulator separates refrigerant and oil so that oil stays in the lower part of the accumulator, where an oil level indicator shows if and how much oil has been drained from the air-conditioner compressor.

On the low-pressure side - just before the compressor - the refrigerant passes an acid filter drier.

A suction pressure regulator limits the pressure to 0.5 bar g - in order to protect the compressor against a too high suction pressure.

On the high-pressure side of the compressor the refrigerant passes an oil separator, a coarse filter and a drying filter before it is condensed, whereafter it is led into the internal cylinder.

This cylinder is equipped with a safety device, which automatically stops the unit when about 4.2 kg has been reclaimed.

In case of the presence of non-condensable gases these will be accumulated in the top of the internal cylinder resulting in a pressure increase.

Venting the non-condensable gases is done automatically.

From the internal cylinder the refrigerant can be drained off in liquid state via a manual shut-off valve.

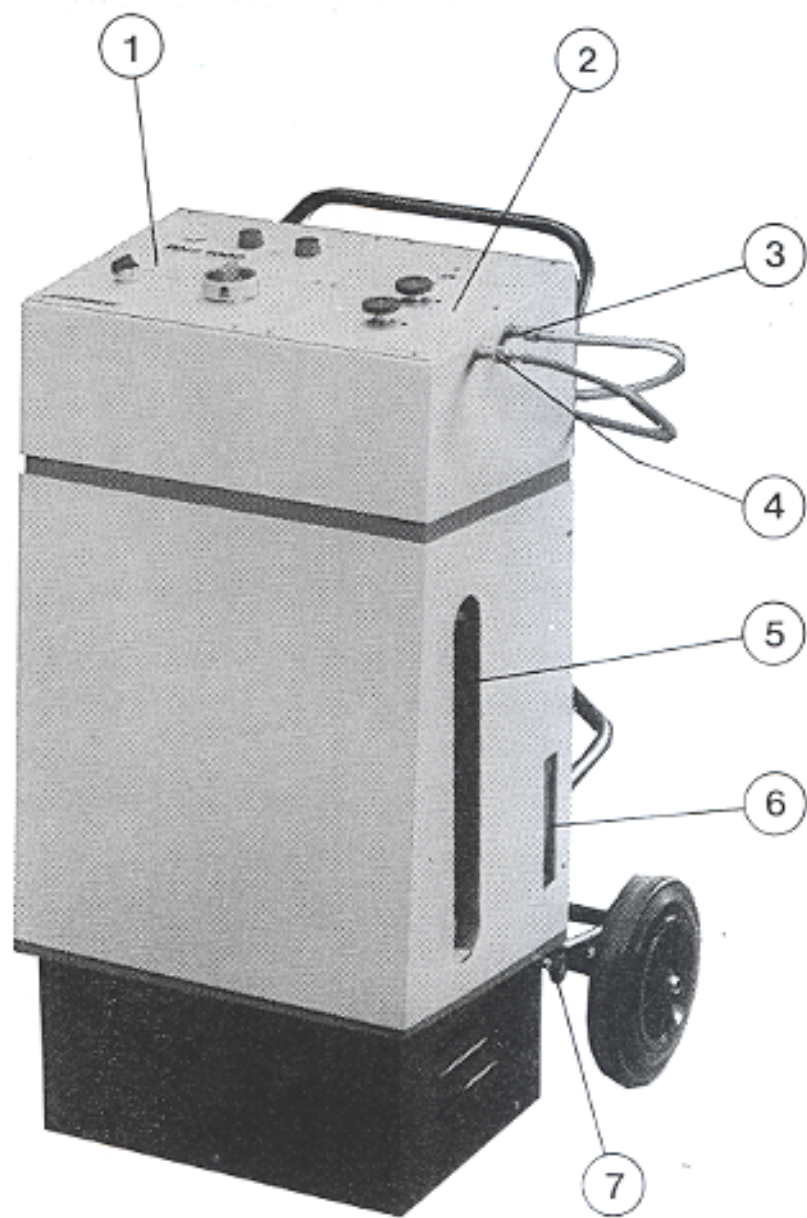
DESCRIPTION

Components

1. **Electrical operator control panel:** including main switch and control lamps.
2. **Mechanical control panel:** including manual shut-off valves and moisture indicator.
3. **Refrigerant outlet stub:** 1/4 in SAE (male flare) fitting used to either charge the air-conditioning system of the vehicle or filling the external cylinder.
4. **Refrigerant inlet stub:** 1/4 in SAE (male flare) fitting which accepts all refrigerant to be reclaimed by the station.
5. **Glass tube with scale:** that makes it possible to see the amount of refrigerant filled into the cylinder. It is also used if you want to charge an air-conditioning system.
6. **Oil level indicator:** for the control of the amount of oil being recovered together with the refrigerant from the vehicle.
7. **Manual shut-off valve:** for draining of the collected oil from the vehicle.

DESCRIPTION

Components

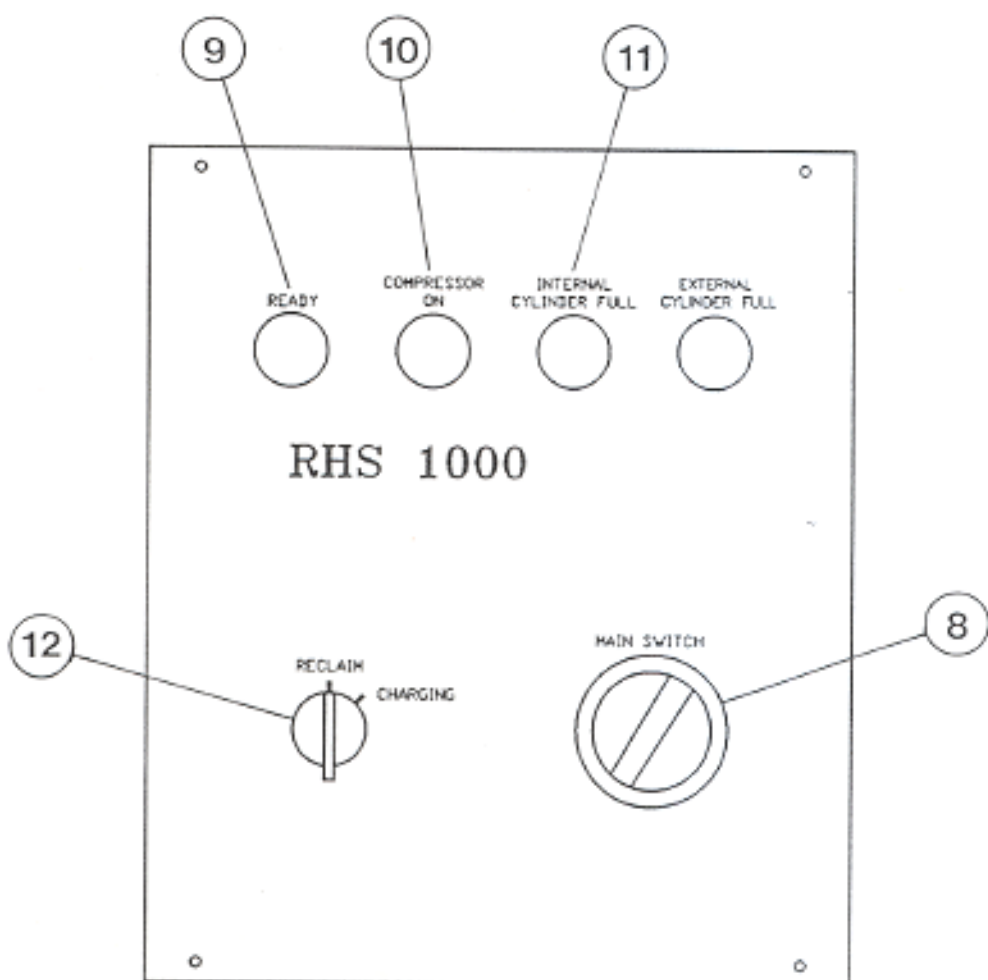


DESCRIPTION

Components

Status lights on control panel:

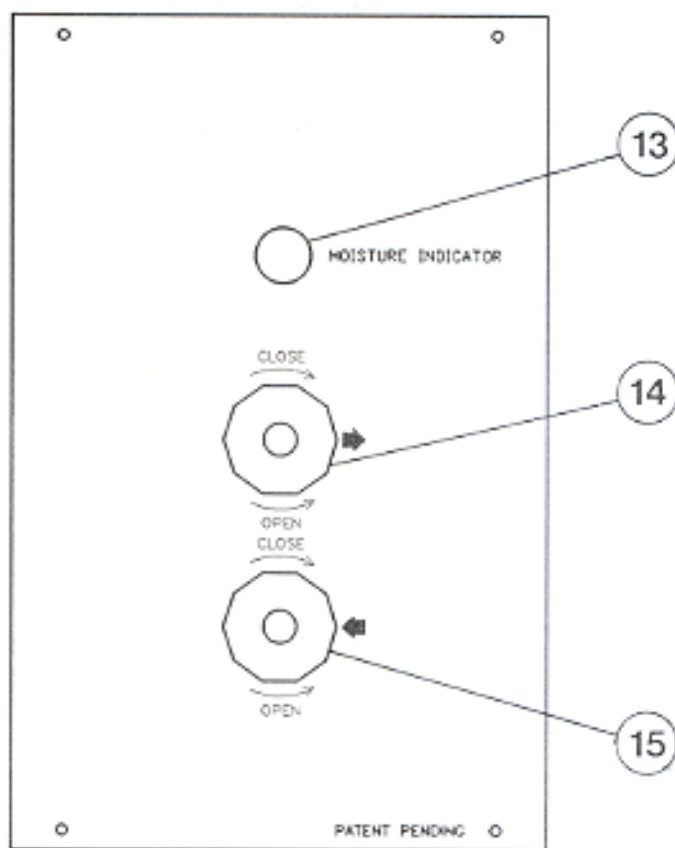
8. **MAIN SWITCH:** controls the power supply to the station.
9. **READY (white lamp):** indicates power on.
10. **COMPRESSOR ON (green lamp):** indicates that the compressor is running and that the pressure is higher than set on the low-pressure control and lower than set on the high-pressure control.
11. **INTERNAL CYLINDER FULL (red lamp):** indicates that the cylinder is filled up to the 4.2 kg mark and that the overflow switch is operating - the compressor is stopped at the same time.
12. **RECLAIM/CHARGING control switch:** switches between reclaim and charging.



DESCRIPTION

Components

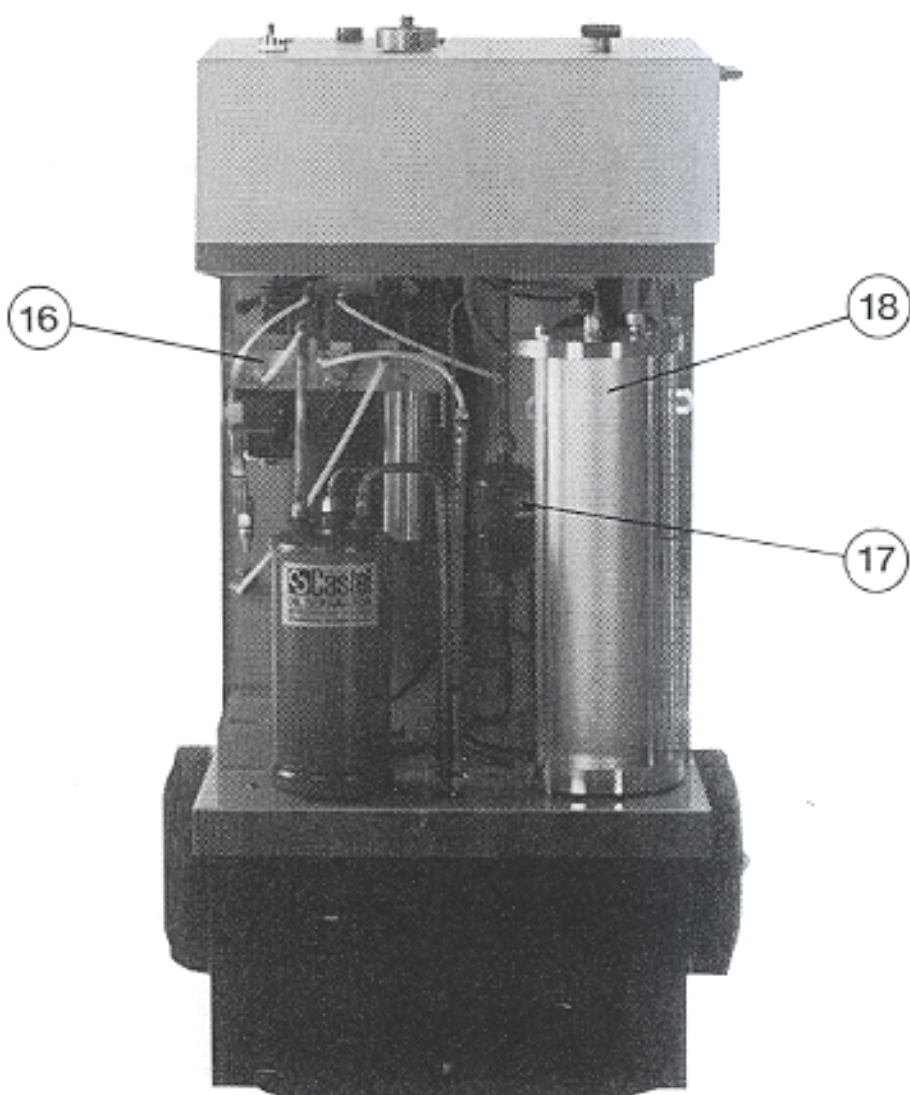
13. Moisture indicator: rough indicator for moisture content.
14. Outlet, manual shut-off valve: that controls the discharge of the station.
15. Inlet, manual shut-off valve: that controls the flow of refrigerant from the vehicle.



DESCRIPTION

Components

16. Dryer block: contains coarse oil filter and drying filters.
17. Acid filter drier: protects the internal compressor and limits the amount of acid being filled into the internal cylinder.
18. Internal cylinder: for storage of reclaimed refrigerants - 4.2 kg.



OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Check the station of transport damages. If you find any, please contact the supplier immediately.
- Check that the supply voltage corresponds to the values stated on the station.
- Check that the refrigerant type for which the station is applicable corresponds to the type stated on the station.

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Mount 220 V plug with earth.
- Mount the set of hoses (fig 2) to the inlet stub (pos 4, page 9).

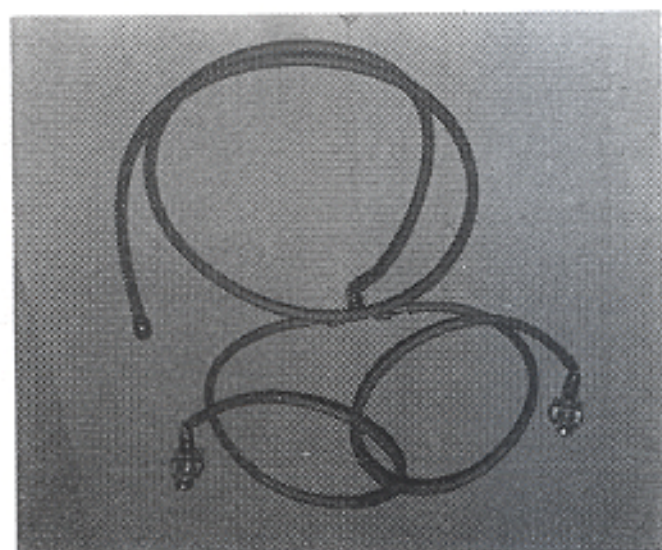


Fig.2

- Connect the yellow hose from the outlet stub (pos 3, page 9) to the external cylinder. The hose must always be mounted when there is an external cylinder on the station. The connection on the cylinder must be on the vapour stub.

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Check the oil level in the compressor before start-up of the station.
- The compressor oil level must be identical with the level on the left handside of the compressor (fig 3).
- If the compressor oil level is too low, compressor oil must be supplied on the charging stub (fig 4) until the correct level has been obtained.
- Charging of oil - see 'Regular control and service'.

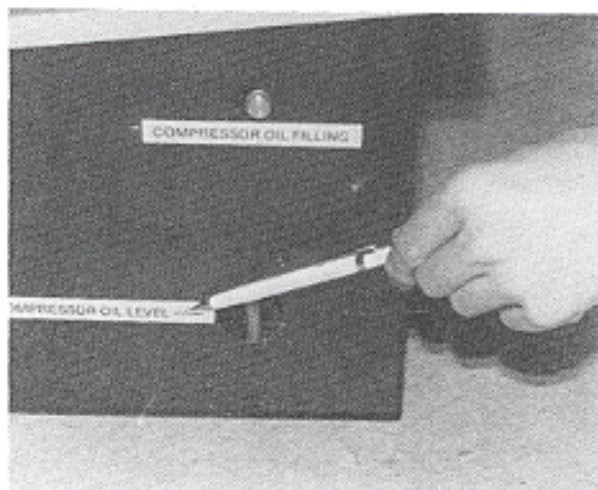


Fig.3

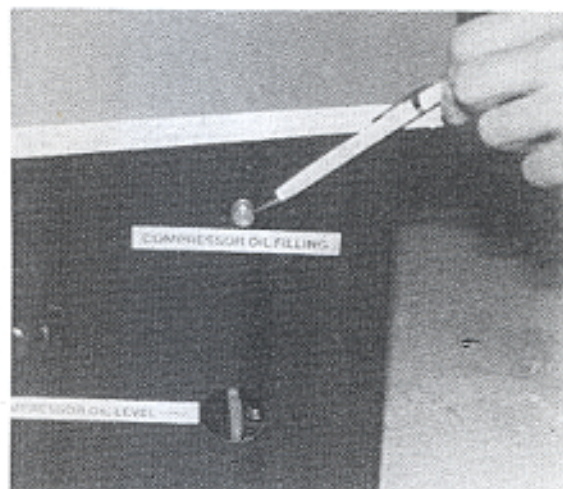


Fig.4

- Check oil level in suction accumulator (pos 6, page 9). If there is oil in the oil glass, it must be emptied by means of the valve on the right handside of the compressor (pos 7, page 9).

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Connect the station to 1 x 220 V/50 Hz + earth.
- Connect the station to compressed air (fig 5). The compressed air is ordinary workshop compressed air without oiling. The pressure is to be between 5 and 8 bar - 100 l/min.
- When mounting compressed air, air will blow inside the station. This is not to be taken as a leak, it has to be that way and it indicates that the drying process works.
- You have to make sure that the set of hoses is mounted correctly. The valves must be closed (turned clockwise).

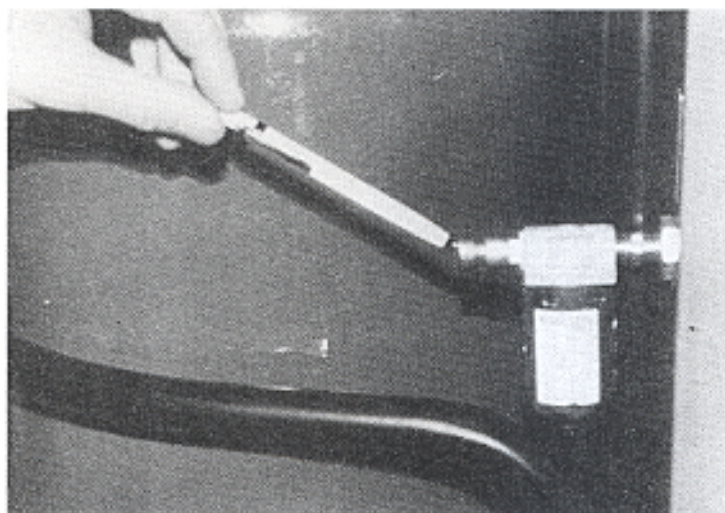


Fig.5

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Make sure that the internal cylinder is charged with the correct amount of refrigerant (fig 6) to be able to charge the air-conditioning system. This is done by mounting a refrigerant cylinder with hose on the inlet side and opening the valve on the cylinder on the vapour side.
- REMEMBER that when charging from a cylinder into the station you have to charge from the vapour side. Otherwise (charging from the liquid side) it would not take long before the suction accumulator was filled with liquid. Thus you would risk a liquid hammer in the compressor.
- Set the MAIN SWITCH to ON. Select the RECLAIM (pos 12, page 10) process on the front panel. Now the inlet valve is to be opened (pos 15, page 11) and the station is operating.
- When the amount of liquid required (approx 2 kg) has been reached (fig 6), the valve on the cylinder must be closed and you have to wait until the compressor stops. The green light in the lamp COMPRESSOR ON extinguishes. Then the inlet valve is to be closed and the cylinder incl hose can be dismantled.

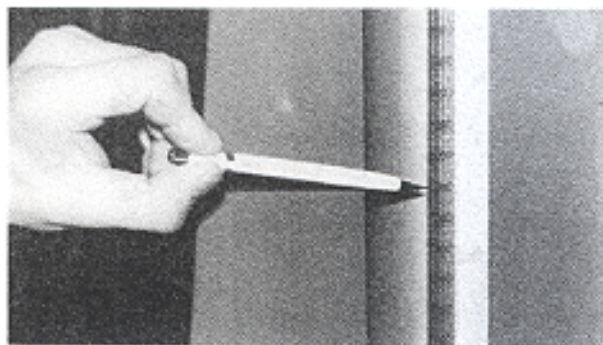


Fig.6

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Mount the hoses (fig 2) on the high and low-pressure side of the air-conditioning system to be emptied (fig 7). At the end of the hoses check valves are mounted, which are to be mounted as shown in fig 8 and then they must be pressed from behind so that the Schraeder valve opens on the car.

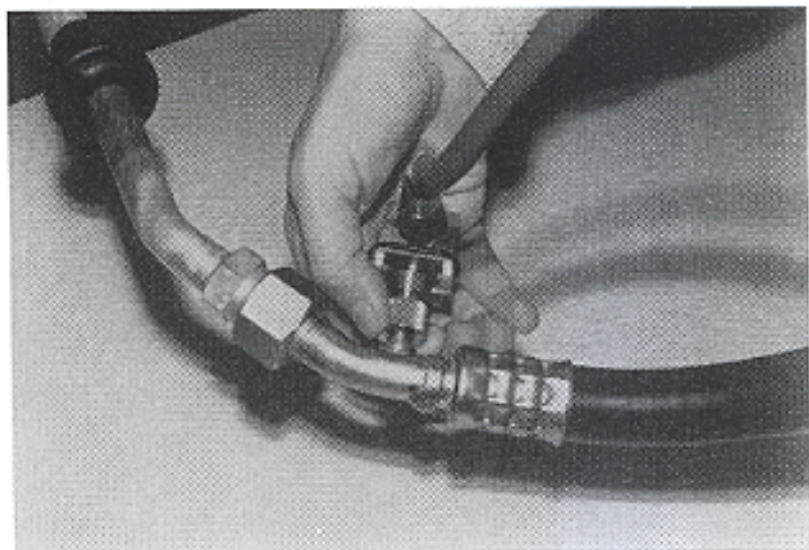


Fig.7

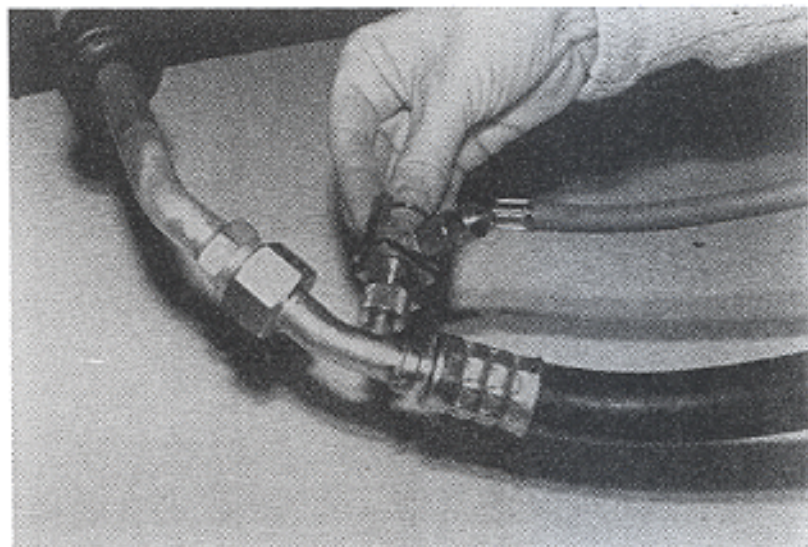


Fig.8

OPERATIONAL INSTRUCTIONS

How to prepare RHS 1000 for use

- Make sure that the switch (pos 12, page 10) is on RECLAIM.
- Turn the MAIN SWITCH to ON and the white lamp READY (pos 9, page 10) is lit. The compressor will automatically drain the suction accumulator and after approx 1 minute the station is ready for use.

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

NOTE!

The recovery and reclaim station has a built-in suction accumulator of 2.4 l in order to ensure correct function. Thus the station only accepts a certain amount of refrigerant R12 in liquid form.

But when draining several cars in one row without the green lamp (COMPRESSOR ON) extinguishing once or at the draining of large units, containing more than 2 kg refrigerant - overcharging of refrigerant in liquid form might occur, which will cause damage to the station. - Therefore the following precautions must be taken:

1. The inlet side of the recovery station should always be connected to the vapour stub on the air-conditioning system.
2. If this is not possible, it will be necessary to check that the system does not contain more than 2.4 l refrigerant.
3. The air-conditioning system must always be drained so that the lamp COMPRESSOR ON extinguishes before connection to the next air-conditioning system.

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

Reclaim:

- Open the inlet valve.
- Now the station empties the air-conditioning system.
- The green lamp COMPRESSOR ON indicates that the compressor is on. If it is off and stays off, the air-conditioning system is emptied within approx 10-20 minutes - dependent on temperature and amount.
- When the air-conditioning system has been emptied, the oil level must be checked as oil has disappeared from the system.
- Refill the same amount of oil onto the air-conditioning system which has disappeared from the system.
- The green lamp COMPRESSOR ON will flash in quite long intervals between the starts. At intervals of 5 minutes or more between each start of the compressor (green lamp ON), it means that the air-conditioning unit in the car has been emptied and that the hoses can be dismantled.
- There is a built-in safety device in the internal cylinder. This safety device disconnects the compressor when the internal cylinder has been filled to 80% which means it contains approx 4.2 kg refrigerant.
- This is indicated by means of the red lamp INTERNAL CYLINDER FULL (pos 11, page 10). The compressor stops.

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

Emptying the internal cylinder:

- Before emptying the content of the internal cylinder into a tank, you have to make sure that the yellow hose from the outlet valve (pos 14, page 11) is mounted to the cylinder.
- Then the outlet valve is opened, and after that the valve on the cylinder is opened. When charging to the cylinder make sure it is done to the vapour side.
- Set the selection switch (pos 12, page 10) to CHARGING.

NOTE: THE CYLINDER MUST NOT BE FILLED MORE THAN TO 80%

- When the internal cylinder is empty the two valves are closed again.

Make sure that there still is a small liquid level in the internal cylinder, in order to prevent non-condensable gases from entering into the external cylinder.

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

Charging the air-conditioning system:

- The station can also be used for charging of the air-conditioning system again. This is done by dismantling the yellow hose. Then the hose is to be mounted as shown (fig 9).

Please note that there is a built-in T-piece with a valve so that a vacuum pump can be mounted for the evacuation of the air-conditioning system. This is to be done, so that the hoses are not to be dismantled after the evacuation, and thus no air enters the air-conditioning system. This precaution is taken because the Schraeder valves of the air-conditioning system are not vacuum tight.

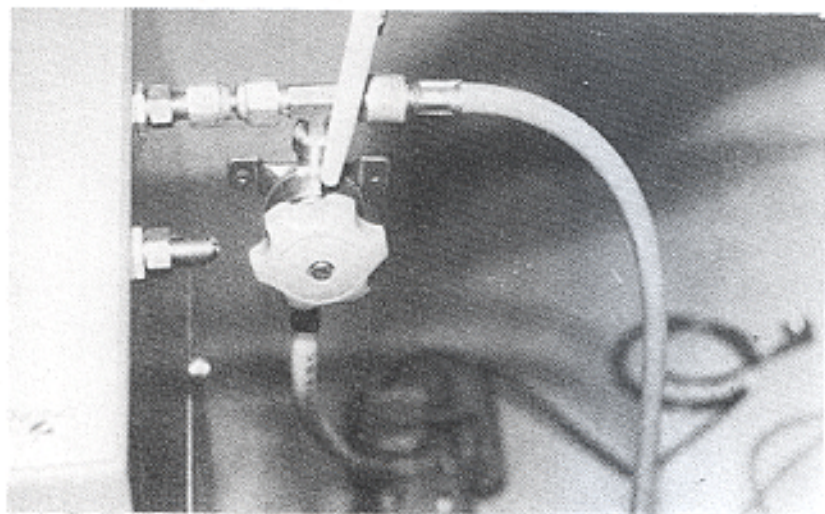


Fig.9

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

Charging the air-conditioning system:

- Check in the car instruction manual, how much refrigerant is to be charged onto the air-conditioning system of the car.
- Charging of refrigerant is done by mounting the hose as described in figs 7 and 8.
- Set the switch (pos 12, page 10) to position CHARGING.
- Open the valve (fig 9) and start the vacuum pump. The air-conditioning system is now evacuated. Please note that there has to be built in a measuring instrument between valve and vacuum pump, so that the vacuum level in the air-conditioning system can be supervised.
- When the air-conditioning system has reached the correct vacuum level, the valve to the vacuum pump (fig 9) is closed again.
- Now the air-conditioning system is ready to be charged.
- Then disconnect the hose from the low pressure side of the air-conditioning system. Charging is only performed on the high pressure side.
- Then you have to read the amount of refrigerant on the internal cylinder scale (fig 6). Secondly, the marking is set to the required charging amount (fig 10), and the outlet valve (pos 14, page 11) is opened. When the correct charging amount has been reached, (please be aware that small amounts do not take very long), the outlet valve is closed again.
- When the outlet valve has been closed, you have to wait another 30 seconds before the hoses can be dismantled. This is done to make sure that the refrigerant can get into the air-conditioning system.
- Please note that after dismantling of the hoses, there will still be refrigerant in the hoses.

OPERATIONAL INSTRUCTIONS

Using the RHS 1000

Charging the air-conditioning system (fig 10):

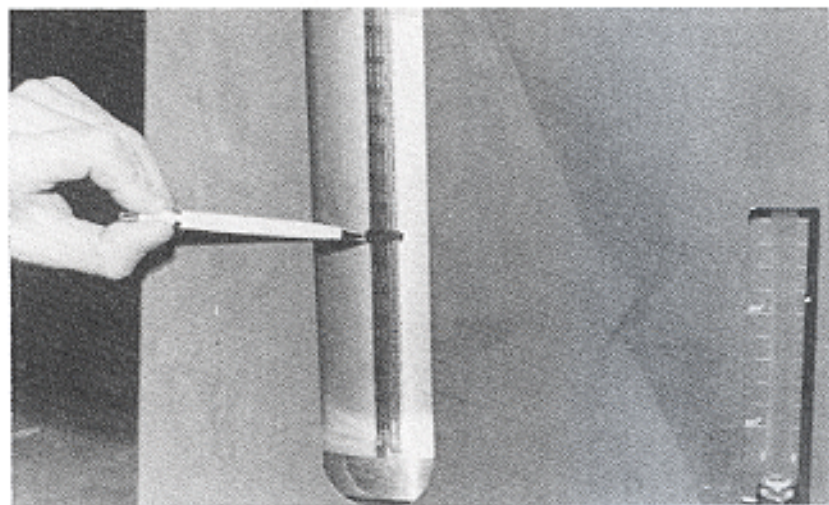


Fig.10

OPERATIONAL INSTRUCTIONS

Regular control and service

To ensure trouble-free operation maintain the RHS 1000 according to the following schedule:

After 100 operating hours:

Check the oil level of the compressor. Max. level in the middle of the sight glass, minimum at the lower part of the sight glass. If the level is below minimum, replenish (5 mm = 100 ml oil). When replenishing only fill till the level is just visible in the sight glass.

Check the condenser:

The fins on the condenser in the compressor compartment might be chucked up with dust and dirt. This reduces the compressor capacity and causes a longer process time stressing the compressor.

- Remove cover for compressor compartment.
- Clean the condenser fins carefully with compressed air and if necessary a brush. However, do not bend the fins, because this will restrict the air flow reducing the capacity.
- Replace cover again.

OPERATIONAL INSTRUCTIONS

Regular control and service

Regularly (figs 11 and 12):

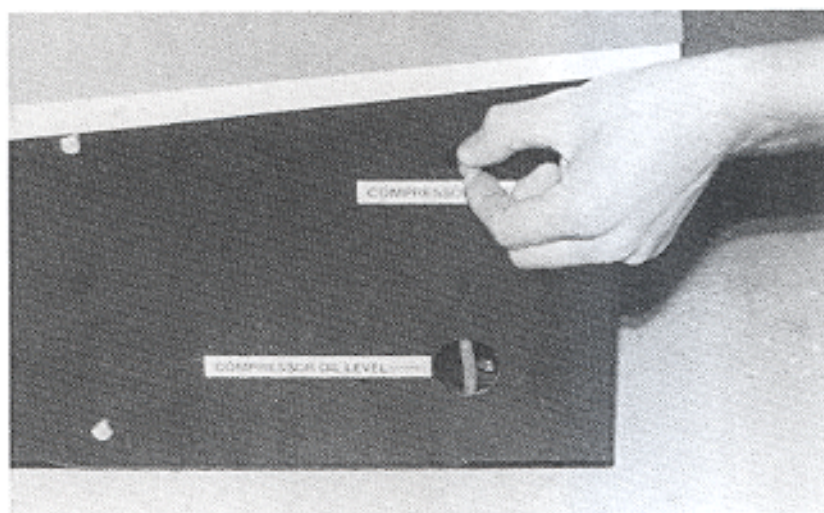


Fig.11

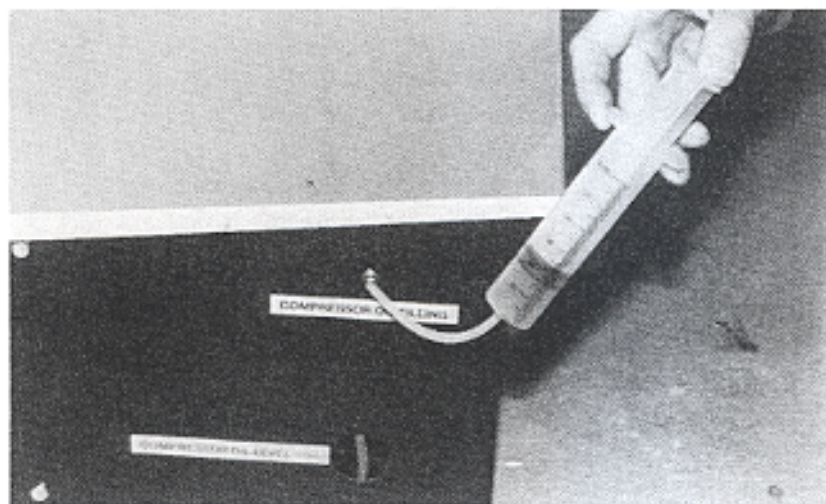


Fig.12

OPERATIONAL INSTRUCTIONS

Regular control and service

Before changing filters - make sure that the complete station has been emptied of refrigerant as much as possible.

Every 100 working hours

Change of acid filter drier

- Remove front cover.
- Replace the existing filter by loosening the two 3/8 in flare nuts.
- Replace front cover.

OPERATIONAL INSTRUCTIONS

Regular control and service

Every 500 working hours

On the dryer block (pos 16, page 12) the oil filter (fig 13), drying medium refrigerant (fig 14), drying medium air (fig 15) have to be changed.

- When changing the oil filter and drying medium refrigerant you have to calculate with a minor refrigerant release.
- Change of filters is done by unscrewing the rodshaped bolts (fig 16) and exchanging the drying medium, oil filter and gaskets.
- Service kit is available at your supplier.
- When mounting the filter cover the nut has to be tightened with a torque of 15 Nm (fig 17).

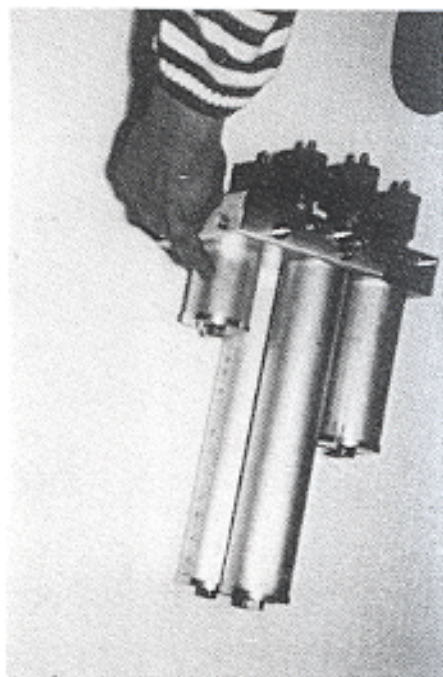


Fig.13

OPERATIONAL INSTRUCTIONS

Regular control and service

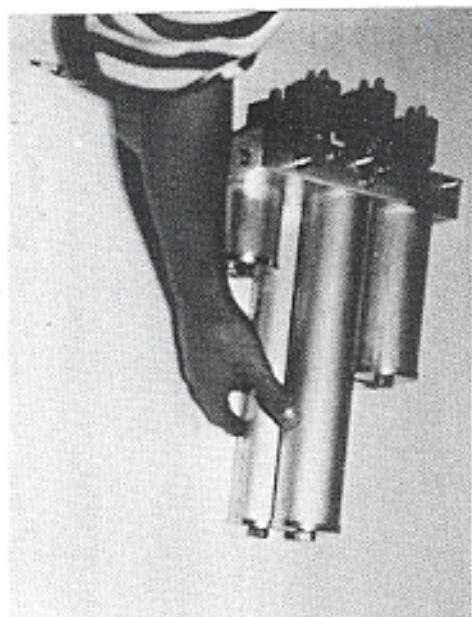


Fig. 14

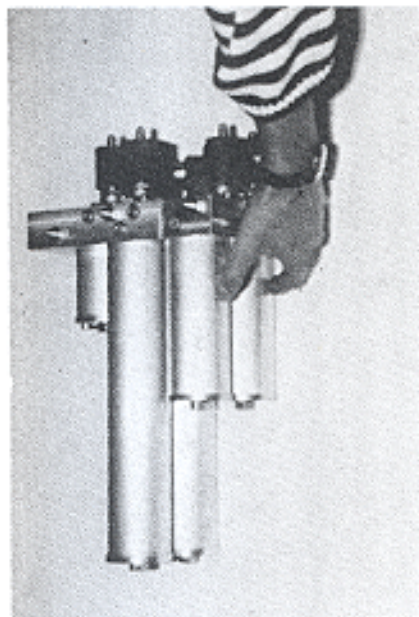


Fig. 15

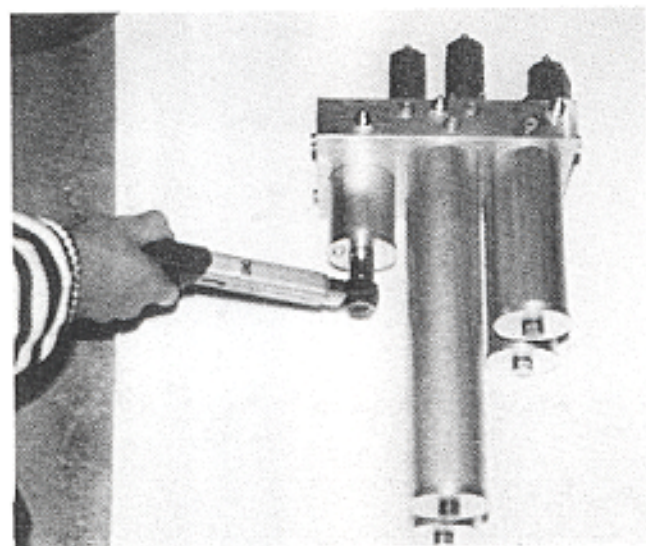


Fig. 16

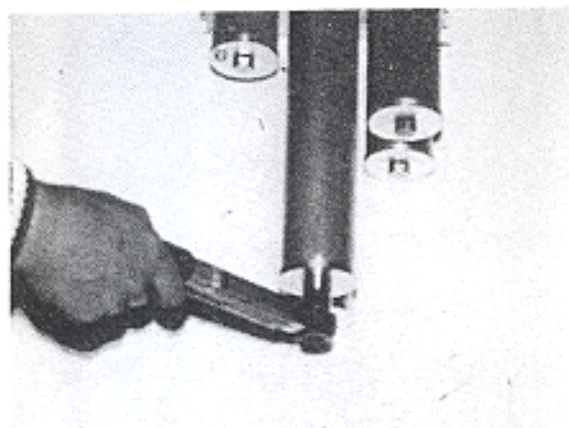


Fig. 17

SERVICE KIT - no: 640-030001A - (RHS 1000/R12)

Consists of:

Qty	Description	Code no

1	acid filter	069-2110062
0.25 l	compressor oil	290-0001250
1 kg	molecular sieves - freon	069-3559572
0.6 kg	molecular sieves - air	069-3559512
7.1 cm	oil filter	069-5659024
10	Gaskets- $\phi 60/\phi 54$	650-100057A
5	Gaskets-nylon	065-0213232
10	Gaskets for service hoses	066-7750950

TROUBLE SHOOTING - RHS 1000

FUNCTION	FAULT	POSSIBLE FAULT	ELIMINATION OF FAULT
<ul style="list-style-type: none"> - Actuate the MAIN SWITCH 	<ul style="list-style-type: none"> - No light in the lamp READY 	<ul style="list-style-type: none"> - No current in plug - Blown fuse - Blown bulb 	<ul style="list-style-type: none"> - Contact electrician - Change the fuse (placed in the el-box) - Change bulb
<ul style="list-style-type: none"> - Connect RHS 1000 to the air-conditioning system 	<ul style="list-style-type: none"> - No light in the lamp COMPRESSOR ON, but the compressor is actuated - No light in the lamp COMPRESSOR ON, and the compressor does not work 	<ul style="list-style-type: none"> - Blown bulb - Check that the air-conditioning system is under pressure - Check that the check valve on the hose is OK - Check that the inlet valve is open 	<ul style="list-style-type: none"> - Change bulb - The air-conditioning system is empty - If not - contact your supplier - If not - open the inlet valve
<ul style="list-style-type: none"> - Draining of the air-conditioning system 	<ul style="list-style-type: none"> - The compressor works, but the air-conditioning system is not emptied, and no liquid gets into the internal cylinder - The compressor starts and stops in intervals of few seconds, although the low-pressure side is under pressure - Indication of INTERNAL CYLINDER FULL although it is not full - The station stops, and the internal cylinder is full, but the lamp INTERNAL CYLINDER FULL does not light - The station works and the internal cylinder is full, but the station does not stop on INTERNAL CYLINDER FULL 	<ul style="list-style-type: none"> - Valve fault in the compressor - Fault on high pressure side - Short circuited level control - Blown bulb - Fault on level control - Relay fault 	<ul style="list-style-type: none"> - Contact your supplier - Contact your supplier - Contact your supplier - Change bulb - Contact your supplier - Contact your supplier

FUNCTION	FAULT	POSSIBLE FAULT	ELIMINATION OF FAULT
<ul style="list-style-type: none"> - Draining of the air-conditioning system 	<ul style="list-style-type: none"> - Compressor does not stop and the low pressure is under 0,9 bar abs - The station blows off non-condensable gases, constantly - The station blows off refrigerant at the air outlet on the drying block all the time 	<ul style="list-style-type: none"> - Relay fault - Fault on low pressure control - Fault on pressure control - Fault on level control, so that the cylinder is full and blows off liquid refrigerant - Fault on check valve on drying block 	<ul style="list-style-type: none"> - Contact your supplier - Contact your supplier - Contact your supplier - Contact your supplier - Contact your supplier
<ul style="list-style-type: none"> - Draining of internal cylinder 	<ul style="list-style-type: none"> - The cylinder is not drained of liquid 	<ul style="list-style-type: none"> - The outlet valve on the station is closed - The valve on the cylinder is closed - Cylinder is overcharged - Pressure equalization in internal cylinder and cylinder 	<ul style="list-style-type: none"> - Open the valve - Open the valve on the cylinder - Check the weight of the cylinder, and if overcharged, it must be drained so that it is only filled to 80% - Close the outlet valve and wait until the station has built up a larger pressure in the internal cylinder
<ul style="list-style-type: none"> - Charging of the air-conditioning system 	<ul style="list-style-type: none"> - The compressor runs although the switch is in position CHARGING 	<ul style="list-style-type: none"> - Relay fault - Fault on switch 	<ul style="list-style-type: none"> - Contact your supplier - Contact your supplier