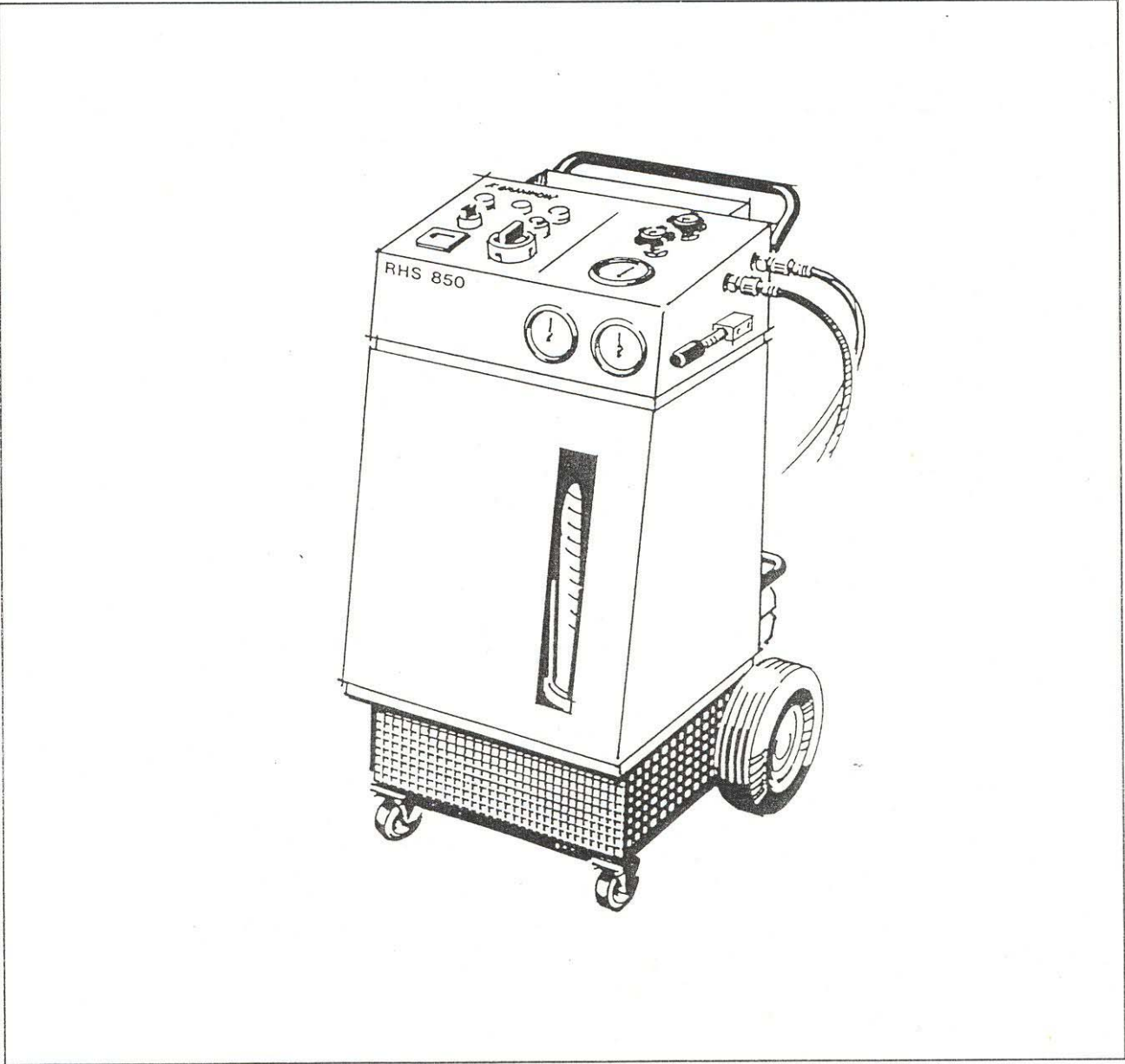


**Recovery, recycling, evacuation and charging station
RHS 850**



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1. APPLICATION

Your new RHS 850 station represents the latest in equipment for servicing air conditioning units. The station is designed for the refrigerants R12 and R134a. It can, and must, only be used for one of these refrigerants.

RHS 850 is a test, recovery / recycling (drain/clean), evacuation and charging station and is thus able to perform a total process cycle in servicing air conditioning units for the automobile industry.

The four processes - from test to charging - are performed by operating a process selector and two manual shut-off valves. The risk of error operation is therefore reduced to an absolute minimum.

The different process sequences are continuously monitored to ensure that they are being performed automatically and correctly. In addition, safety devices are incorporated which prevent and indicate faults like overpressure or over-filling of the charging cylinder.

The recycling process is designed to follow the SAE standards J1989 and J2099 on recycled refrigerant for automotive air conditioning units.

During the recovery process, a small quantity of oil is drained from the A/C-system. On completion of the recovery process this quantity can be drained into a measuring cup. The same quantity of new compressor oil must be filled into the A/C-system before charging of refrigerant. Please follow the instructions from the manufacturer and use only the specified types of oil.

The filter drier has a very high capacity (300 kg) and can be replaced during servicing without discharging refrigerant to the atmosphere.

1. APPLICATION

Non-condensable gases are vented automatically via a system that also ensures minimal discharge of refrigerant to the atmosphere.

Before commissioning RHS 850 - read the instructions carefully to make sure that the process is correctly performed.

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

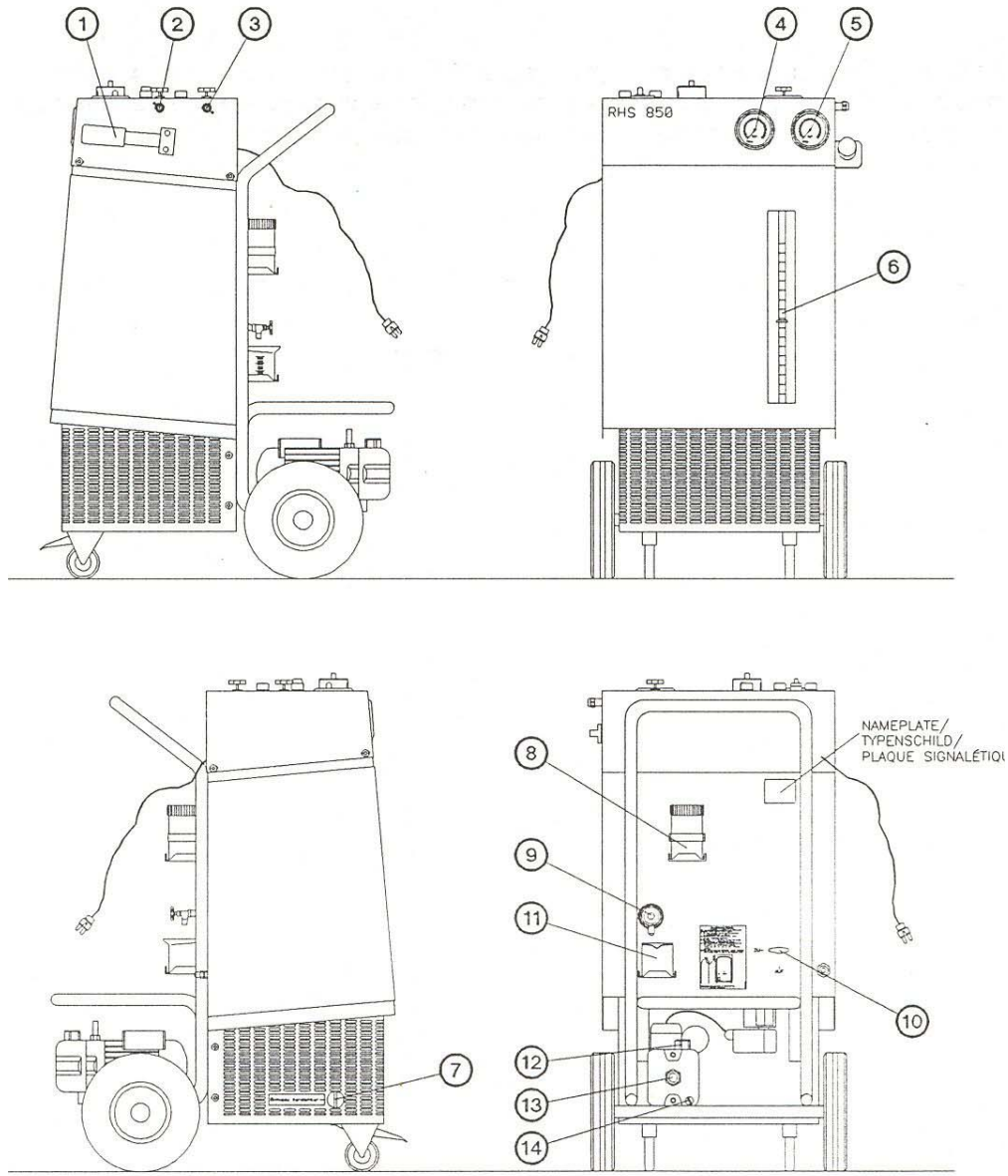
This RHS 850 is built according to the European standards for safety and health.

See Appendix for "Declaration of conformity".

2. SAFETY PRECAUTIONS

- 1) Always wear protective goggles and gloves when working with refrigerant.
- 2) Do not allow refrigerant to come into contact with the skin or eyes.
- 3) Before connecting RHS 850 to the air conditioning unit, make sure that the manual shut-off valves are closed and that the process selector is in test position.
- 4) Before disconnecting RHS 850 from the air conditioning unit make sure that the process is complete so that refrigerant does not escape to the atmosphere.
- 5) After transferring refrigerant from charging cylinder to external cylinder, make sure that the manual shut-off valve on both external cylinder and station are closed (if any).
- 6) Do not use the RHS 850 in wet areas.
- 7) Disconnect the electrical supply before performing maintenance on RHS 850.
- 8) To reduce the risk of fire, avoid using an extension cord. If however an extension cord is necessary, it must have a minimum cross-sectional area of 2.5 mm².
- 9) In the event of fire, remove external cylinder (if any).
- 10) When oil which accompanies refrigerant drained from the air conditioning unit is tapped from the suction accumulator into the measuring cup supplied, ensure that it is handled according to the existing national legislation. A suitable container can eg be supplied from a refrigerant supplier.
- 11) Always brake the two front wheels of the station when parking.

3. SYSTEM DESCRIPTION



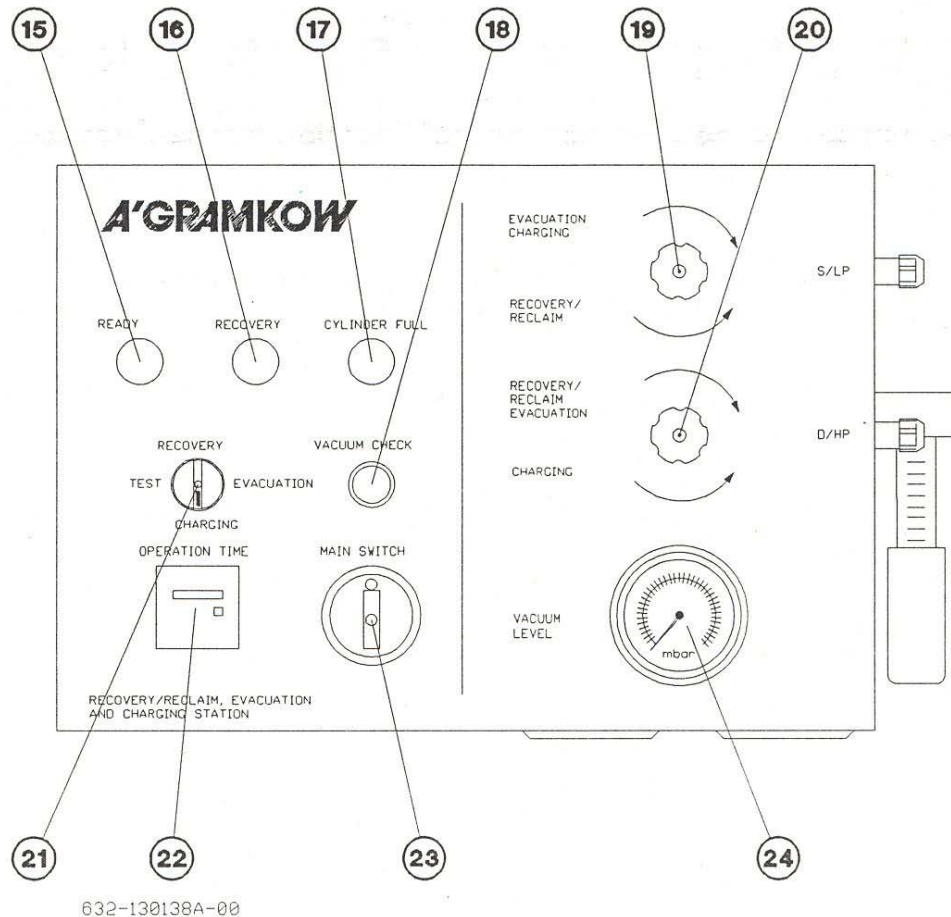
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- 1) **Oil pump**
- 2) **Connection - high pressure.**
Hose connection for the high pressure side of the refrigerant unit.
- 3) **Connection - low pressure.**
Hose connection for the low pressure side of the refrigerant unit.

3. SYSTEM DESCRIPTION

- 4) **Low-pressure gauge:** indicates the pressure on the low-pressure side in the test function.
- 5) **High-pressure gauge:** indicates the pressure on the high-pressure side in the test function.
- 6) **Level tube:** for reading amount of refrigerant in the filling cylinder incl. indicator (o-ring), indicating the level.
- 7) **Level tube:** for control of oil level in compressor.
- 8) **Oil reservoir**
- 9) **Oil draining valve:** Draining of the oil received from the A/C-unit.
- 10) **Quick charge valve**
- 11) **Measuring beaker:** for drained oil - 250 ml.
- 12) **Oil filling lid - Vacuum pump**
- 13) **Oil sight glass - Vacuum pump**
- 14) **Oil draining screw - Vacuum pump**

3. SYSTEM DESCRIPTION



- 15) **Ready** - lamp (white): indicates station ready for process operation and main switch (pos 23) on.
- 16) **Recovery** - lamp (white): indicates compressor running and that pressure is higher than set on the low-pressure control and lower than set on the high-pressure control.
- 17) **Cylinder full** lamp (red): indicates charging cylinder 80% full. Stops process sequence.
- 18) **Vacuum check** button (yellow): used only during the evacuation process. Connection between vacuum pump and air conditioning unit broken. If leaks in the air conditioning unit, read on vacuum gauge (pos. 24).

3. SYSTEM DESCRIPTION

- 19) **Recovery valve:** open during recovery/recycling process, closed during test, evacuation and charging processes. Opened by turning knob counterclockwise.
- 20) **Charging valve:** open during charging process, closed during test, recovery/recycling and evacuating processes. Opened by turning knob counterclockwise.
- 21) **Process selector:** for changing over between the four processes involved in servicing an air conditioning unit. Selector rotation is clockwise. The selector is reversible between all processes, except from charging to evacuation.
- 22) **Hour counter:** measures compressor running time to give basis for determining service intervals.
- 23) **Main switch:** on/off switch for mains supply to station. If station is switched on, "ready" lamp, (pos. 15), lights up.
- 24) **Vacuum gauge:** measures vacuum level during the evacuation process.

4. BEFORE USING THE RHS 850

Check the following:

- Whether the station has been damaged in transit - if so, contact supplier immediately.
- Oil level in vacuum pump: the level must not lie under the centre of the sight glass. If the level does not meet the requirement, see Section "Maintenance" for vacuum oil replenishment instructions.
- Whether the mains supply corresponds with the one listed on name plate of the station.
- Whether the refrigerant in the air conditioning unit corresponds with the one listed on the name plate of the station.

Preparation:

Connect mains plug to mains supply (see name plate).

Connect the red and blue hoses to their stubs on the side of the station. Blue hose to low pressure, red hose to high pressure. See the next 2 pages.

Make sure that the shut-off valves (pos. 9, 19, 20) are closed.

Make sure that the process selector (pos. 21) is in "test" position.

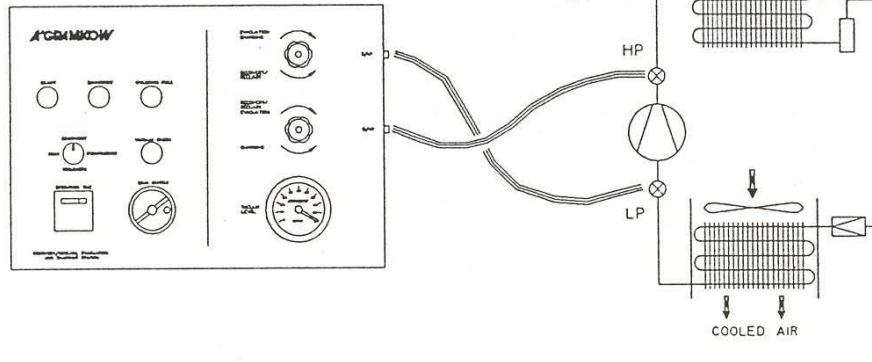
Connect high and low-pressure hoses to their respective sides (using quick-couplings) on the air conditioning unit. See the next 2 pages.

RHS 850 is now ready for operation.

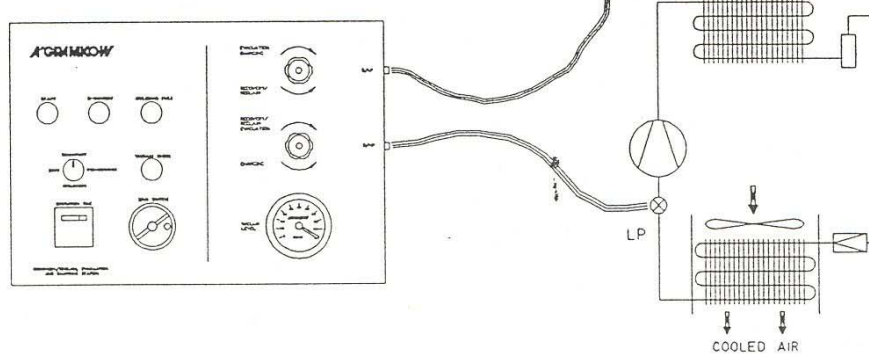
4. BEFORE USING THE RHS 850

Connection of service couplings

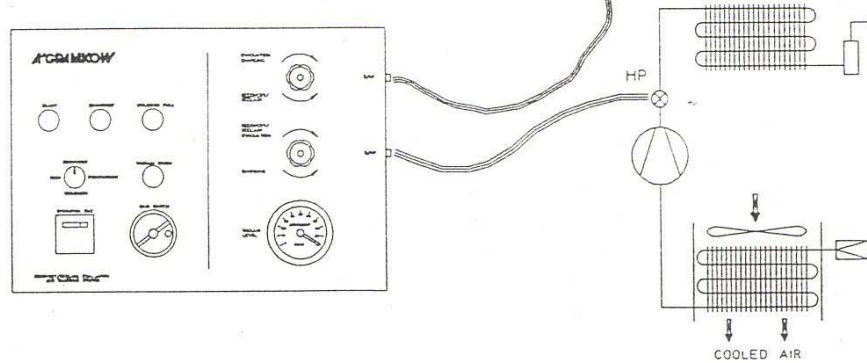
A/C-system with high and low-pressure connection



A/C-system with only low-pressure connection



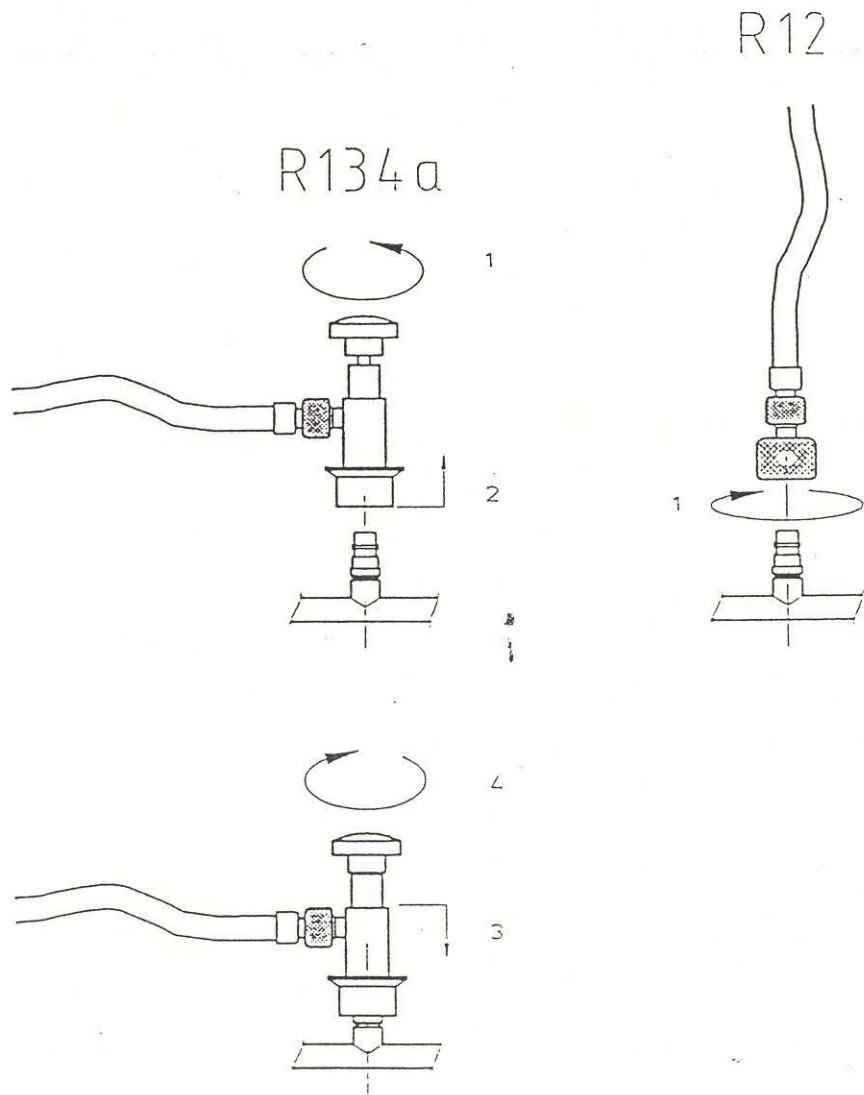
A/C-system with only high-pressure connection



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4. BEFORE USING THE RHS 850

Connection and activation of service couplings



5. OPERATING INSTRUCTIONS

Test

- Set the process selector on "test" function.
- Switch on the station at the main switch (pos. 23).
- The station will now perform the test function. Start the air conditioning unit in the vehicle and the readings on high and low-pressure gauges will indicate whether the unit needs service.

5. OPERATING INSTRUCTIONS

Recovery/recycling

- First check whether the charging cylinder will contain the quantity of refrigerant to be recovered from the air conditioning unit concerned. If not, before the "recovery/recycling" process is started the charging cylinder must be drained until it does not contain more than about 2 kg.
See next page for cylinder draining instructions.
- Turn the process selector (pos. 21) to the "Recovery" position.
- Open the valves on the service couplings including the recycling valve (pos. 19).
- The compressor starts and the "Recovery" lamp (pos. 16) lights up.
- Recovery/recycling now proceeds automatically until the air conditioning unit is empty.
- The recovery/recycling process is finished when the "Recovery" lamp goes out. Wait 5-8 minutes to ensure that the unit is completely empty and then close the recovery valve (pos. 19).
- When the air conditioning unit is empty, the quantity of oil drained from the unit must be measured. This is done by opening the drain valve (pos. 9) and allowing the oil to flow into the measuring beaker supplied. The air conditioning unit must be filled with a corresponding amount of new oil. Please follow the instructions of the manufacturer and use only the specified types of oil.
- At this point, if it is necessary to repair the air conditioning unit the service couplings can be disconnected from the unit and servicing performed. If no repairs are involved, the next step is evacuation.

5. OPERATING INSTRUCTIONS

Draining the charging cylinder

- Use the main switch to turn off the station.
- Connect the hose (red/R12 & yellow/R134a) from the high-pressure side (red) to the external cylinder. The process selector switch must be set on "Charge".
- Open the charging valve (pos. 20). The refrigerant will then flow from charging cylinder to external cylinder. A little amount of refrigerant must always remain in the charging cylinder in order to avoid that air is charged into the air conditioning unit. After the recovery of the charging cylinder, close the charging valve again.
- Close the charging valve again after draining the charging cylinder is complete.
- The station is now ready for the recovery/recycling process.

5. OPERATING INSTRUCTIONS

Quick-charge of charging cylinder

- Before starting the evacuation process it is necessary to check whether the charging cylinder contains sufficient refrigerant for the subsequent charging process. After a charging there must be at least 1 kg refrigerant remaining. If there is not sufficient refrigerant, the charging cylinder must be replenished from an external cylinder as follows.

Important:

Before each quick-charge of the cylinder, make sure to drain oil, if any. (Oil drain valve pos. 9)

- Close the manual shut-off valves (pos. 9, 19, 20).
- Connect the hose from the high-pressure side (red) to the stub on the external cylinder.

Note:

Only use recycled or new refrigerant for quick-charge, otherwise the SAE-standard cannot be met.

- Set the process selector (pos. 21) on "Recovery".
- Open the manual shut-off valve (liquid side) on the external cylinder.
- Open the recovery valve (pos. 19) on the station and the quick-charge valve (pos. 10). The station will now take refrigerant from the external cylinder to the charging cylinder.
- If there is sufficient refrigerant in the charging cylinder, close the manual shut-off valve on the external cylinder again. Now the station will replenish further 500g into the charging cylinder. When the station stops and the "Recovery" lamp goes out, the station can again be reconnected to the air conditioning unit.
- Close all valves.

5. OPERATING INSTRUCTIONS

Evacuation

- Close the manual shut-off valves (pos. 19, 20, 9).
- Dismount the service couplings of the air conditioning unit. Set process switch (pos. 21) on "EVACUATION" and the main switch on 1.
- The vacuum pump now starts and please note the vacuum level of the vacuum meter. This level is the maximum reached vacuum of today!
- Set the main switch on 0 and mount the service couplings on the air conditioning unit again. If the pressure of the manometer has reached max 0,2 barg, set the main switch on 1 again.

Note:

If the vacuum pump does not start, this could be caused by an over pressure in the service hoses/air conditioning unit. Remove this over pressure by following the recovery/recycling procedure (see page 5.2)

If the pressure rises and then again stabilizes, it means that the air conditioning unit acclimatizes the ambient temperature.

- The "Vacuum control" switch (pos. 20) is used to check whether the necessary vacuum level has been reached and for registering any leakage in the air conditioning unit.

5. OPERATING INSTRUCTIONS

Oil filling

Oil filling must not be made, until the evacuation is finished - to be performed in the following way:

- Check, if a satisfactory amount of oil is present in the oil reservoir, otherwise follow the description in the section *Oil refilling*.
- Pull the handle of the oil pump backwards (pos 1), until the required amount of oil is according to the scale of the pump.
- Press the handle all the way back again.

Note! If the required amount of oil is larger than 10 ml, - pump several times until the required amount has been reached.

- The station is now ready for charging. Please follow the charging process in the instructions.

Oil refilling of the oil reservoir

When the oil level in the oil reservoir has reached the lower edge of the holder, oil has to be refilled. Simply remove the cover of the oil reservoir and refill with oil.

Venting of the oil pump

When air has come into the oil pump (when oil has not been refilled in time) the pump has to be vented.

- Pull the handle of the pump backwards (pos 1).
- Loosen the venting screw in the other end of the pump and press the handle again.
- Fasten on the venting screw again.
- Repeat this procedure, until the pump has been vented of air.

5. OPERATING INSTRUCTIONS

Charging of refrigerant

- Close the manual shut-off (pos. 19 + 20) valves.
- Before the charging process check the quantity of refrigerant necessary for the air conditioning unit. This information can be found on a label located under the bonnet of the vehicle.
- Use the O-ring on the charging cylinder sight glass (pos. 6) to mark the level to which the charging cylinder must be drained to ensure that the air conditioning unit receives the correct quantity of refrigerant.
- Turn the process selector (pos. 21) to "Charge".
- Slowly open the charging valve (pos. 20). The air conditioning unit will now become charged. The flow can be followed in the sight glass. When the correct quantity has been obtained, close the charging valve again and turn the process selector to "test" function. Please note that the charging only takes place through the red high-pressure hose.
- It is now possible to check whether the air conditioning unit has been charged with the correct quantity of refrigerant. To do this, start the unit and then read off high and low-pressure from the unit on the appropriate pressure gauges. The correct pressures are stated in the instructions of the manufacturer of the air conditioning unit.
- When charging is complete, wait 30 seconds before disconnecting quick-coupling hoses from the air conditioning unit.
- As hoses will contain refrigerant residue drain them by turning the process selector to "Recovery". Then open the recycling valve. The compressor will then automatically empty refrigerant from the hoses.

6. MAINTENANCE

To guarantee RHS 850 all components used for maintenance must be identical to the service set in section 8.

To ensure problem-free operation of RHS 850, the station must be maintained in accordance with the following.

The power supply to the station must be switched off.

For each 75 operating hours:

Clean the condenser:

- Remove grid (four screws) from lower part of station compressor tray.
- Clean condenser with compressed air and perhaps a soft brush. Be careful not to bend the fins since this will reduce the air flow and lead to a reduction in condenser capacity.
- Replace grid.

Check the oil level in the vacuum pump

If the level is under the centre of the sight glass, replenish as follows:

- Remove cap (pos. 12,) to replenish vacuum pump.
- Replenish (slowly) with vacuum oil to the correct level.
- Replace cap.

6. MAINTENANCE

For each 75 operating hours:

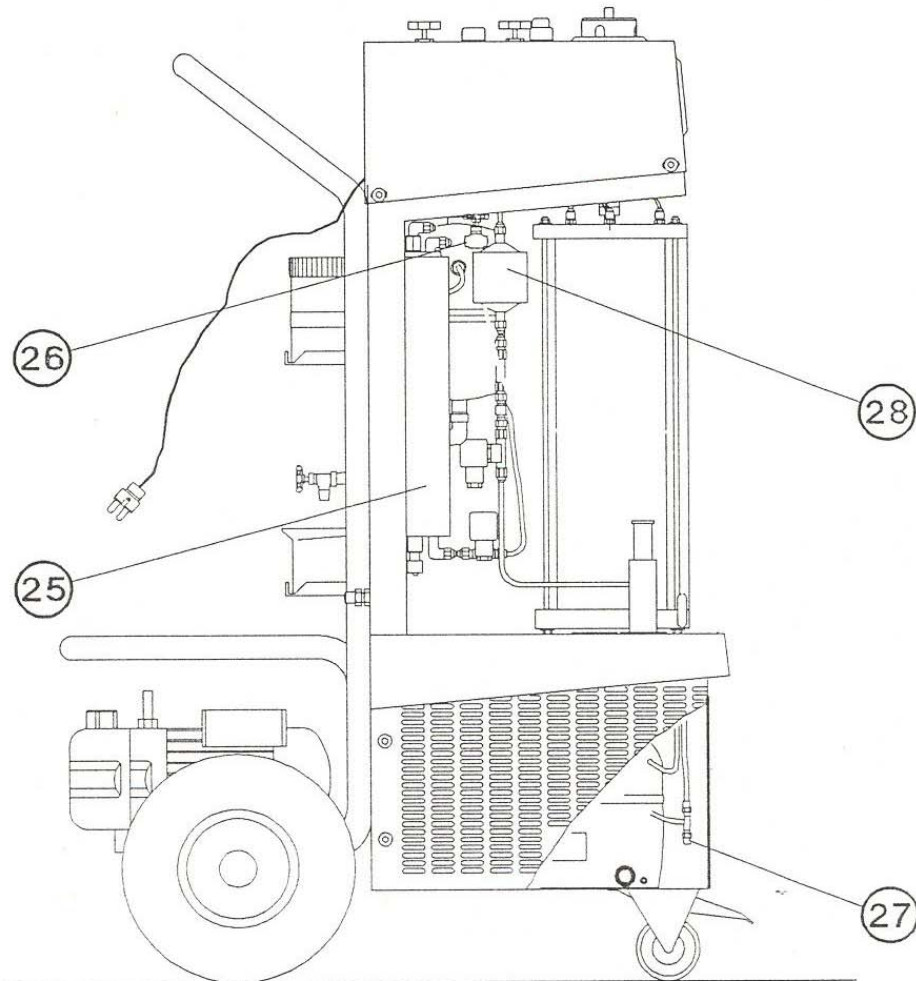
Check oil level in compressor

- Check oil level in the compressor (pos. 7). The oil level must be in the middle of the sight glass.
- If the oil level is too low, please contact your supplier.

6. MAINTENANCE

Replace acid filter (pos. 28).

- Remove cover (four screws).
- Replace filter by loosening two 3/8" flare nuts and fit the new filter. Use only new filters fitted with protective caps on connectors and make sure that filter orientation is correct when fitted (arrow pointing downwards).



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6. MAINTENANCE

For each 75 operating hours:

Replace filter drier (pos. 28)

- Close valve pos. 26
- Mount service hose (yellow=R134a / blue=R12) between low pressure side of the station and service stub on filter (pos. 25)
- Mount service hose (yellow=R134a / blue=R12) between high pressure stub (pos. 27) and a refrigerant container.
- Open inlet valve pos. 19 valve on operator panel. Choose "recovery/recycling process and switch on the main switch.
- The white lamp "Recovery" lights and indicates that the drying filter is being emptied of refrigerant. When the lamp extinguishes the filter is empty. Close the inlet valve and switch off the main switch.
- Dismount filter (pos. 25). Dismount hose connections in both ends.
- Dismount the insulating material on the drying filter and mount it on the new filter.
- Mount the new filter.
- Dismount the service hose between low pressure side and service stub.
- Close valve on refrigerant container. Dismount service hose between high pressure stub and refrigerant container.
- Open valve pos. 26. The unit is now ready for servicing another air conditioning unit.
- Empty refrigerant container by mounting service hose between container and high pressure station. Open inlet valve pos. 19 on operator panel. Set the process selector on "Recovery" and switch on the main switch. The container is empty, when white lamp "Recovery" extinguishes.

6. MAINTENANCE

For each 75 operating hours:

The vacuum pump oil must be replaced.

(The oil will, as time goes by, absorb moisture, which will reduce the vacuum level).

- Hold an oil cup under the oil drain screw (pos. 14) and loosen the screw. Let the "old" oil flow into the oil cup.
- Remove the oil filling lid (pos. 12).
- Fasten the oil drain screw again and fill new oil into the oil filling stub till the level is in the middle of the sight glass (pos. 13).

7. SPECIFICATIONS

General:

Nominal voltage.....	see name plate
Nominal amperage.....	see name plate
Power consumption.....	see name plate
Max. fuse protection.....	see name plate
Weight.....	95 kg
Dimensions.....	1030 x 670 x 800

Test function:

High-pressure gauge.....	-1 to 30 bar and temp. scale
Low-pressure gauge.....	-1 to 10 bar and temp. scale

Recovery/recycling process:

Refrigerant.....	see name plate
Recovery capacity.....	0.2 to 1 kg liquid/min
Oil level measurement.....	drain at rear of station,
Recycling capacity.....	4kg/h (3-5 vehicles/h)
Non-condensable gases.....	automatic venting temp. comp.

Evacuation process:

Suction capacity.....	approx. 3 m ³ /h
Vacuum level.....	< 0.5 mbar
Vacuum level, evacuation only.....	0 to 1000 mbar + TORR scale

7. SPECIFICATIONS

Charging process:

Charging cylinder
capacity..... 4 kg/R134a or 4,2 kg/R12

Operating panel:

Main switch..... on/off power supply switch

Indication lamps - white.... station ready for operation

- white.... compressor running,
recovery/recycling proces
being performed

- red..... charging cylinder full

Process selector..... 1. test
2. recovery/recycling
3. evacuation
4. charging

Vacuum control..... breaks connection between
vac. pump and air cond. unit.
Vacuum level can be read off.

Manual shut-off valves..... open/close depending on
process

Connections

Stub - inlet..... 0.5 in ACME/R134a
1/4 in SAE/R12

Stub - inlet..... 0.5 in ACME/R134a
1/4 in SAE/R12

7. SPECIFICATIONS

Service and maintenance:

Acid filter.....	replaceable, 3/8" SAE
Filter drier.....	replaceable (capacity 75 hours or 300 kg refrigerant)
Hour counter.....	indicates service intervals. Relative to compressor operating hours.
Compressor oil level.....	sight glass + charging nozzle
Vacuum pump oil level.....	sight glass + charging nozzle
Safety equipment.....	- mechanical safety valve on charging cylinder - overfilling protection on charging cylinder - suction pressure regulator on compressor - high pressure regulator on compressor - thermostat + thermo fuse on heat element
Article no - RHS 850.....	see name plate

8. SERVICE SET no: 633-020006A (RHS 850 / R12)

Qty	Description	Order no

1	Acid filter	069-2910127
1	Filter drier	633-010016B
0,25 l	Compressor oil - Mineral	290-0001250
0,25 l	Oil for vacuum pump	290-0001272

8. SERVICE SET no: 633-020005A (RHS 850 / R134a)

Qty	Description	Order no

1	Acid filter	069-2910127
1	Filter drier	633-010016B
0,25 1	Compressor oil - PAG	290-0001240
0,25 1	Oil for vacuum pump	290-0001272

9. ACCESSORIES

Qty	Description	Order no
1	Instruction	632-400060A
1	Service coupling high pressure (R134a)	290-7480095
1	Service coupling low pressure (R134a)	290-7480096
1	Service coupling (R12)	066-7390234
1	Service hose, blue (R134a) = 72in	634-140002A
1	Service hose, red (R134a) = 72in	634-140001A
1	Service hose, yellow (R134a) = 36in	634-140004A
1	Service hose, blue (R12) = 180cm	080-4665015
1	Service hose, red (R12) = 180cm	080-4665017
1	Service hose, yellow (R12) = 90cm	080-4665002
1	Gasket for R134a hose	087-7481010
1	O-Ring for R134a hose	087-7481341
1	Gasket for R12 hose	066-7750950
1	Oil feeder, 60 ml	290-5390268
1	Oil cup, 250 ml	290-0780096
1	Oil charging (R134a)	633-040005A
1	Oil charging (R12)	633-040006A
1	Gasket for oil pump	290-5390768

10. TROUBLE SHOOTING

F: Fault R: Remedy

Recovery process

Compressor on RHS station not running.

F: Main switch not on.

R: Turn on main switch.

F: Power cable not connected or no power on socket.

R: Connect cable and check mains.

F: A/C unit completely empty.

R: Check pressure gauge readings.

F: Valves not open.

R: Open appropriate valves.

F: System pressure exceeds 16 bar.

R: Contact supplier.

F: Charging cylinder full.

R: Empty charging cylinder.

F: Defective components.

R: Contact supplier.

Compressor on RHS station continues running.

F: Leak in A/C unit.

R: Locate and repair leak.

F: Oil drain valve not closed.

R: Close oil drain valve.

F: Charging valve open or leaking.

R: Close or repair valve.

F: Defective components.

R: Contact supplier.

10. TROUBLE SHOOTING

Compressor on RHS station runs briefly but does not complete recovery.

F: Valves not open.
R: Open appropriate valves.

F: Charging cylinder full.
R: Empty charging cylinder.

F: Defective components.
R: Contact supplier.

Compressor on RHS station runs but no refrigerant flow to charging cylinder.

F: Station is new and has to take up approx. 1 kg refrigerant before flow to charging cylinder begins.

R: Allow station to recover at least 2 kg.

F: A/C unit leaking and RHS station sucks only air.
R: Locate and repair leak.

F: Defective components.
R: Contact supplier.

Charging process

No refrigerant flow.

F: Charging cylinder empty.
R: Connect RHS station to full refrigerant cylinder and use **recovery process** to recharge charging cylinder.

F: A/C unit not evacuated.
R: Recover and evacuate A/C unit before charging.

F: Heating element in charging cylinder defective.
R: Contact supplier.

10. TROUBLE SHOOTING

Evacuation process

Vacuum pump not running.

F: Main switch not on.

R: Turn on main switch.

F: Power cable not connected or no power on socket.

R: Connect power cable and check mains.

F: Overpressure remains in A/C unit.

R: Change over to recovery until A/C unit is completely empty.

F: Vacuum pump defective.

R: Contact supplier.

Vacuum pump runs but insufficient vacuum.

F: A/C unit leaking.

R: Locate and repair leak.

F: Hoses not correctly mounted.

R: Check hose connections.

F: Evacuation valve not open.

R: Open valve.

F: Vacuum pump oil has been used more than 150 hours.

R: Change vacuum pump oil.

F: Defective components.

R: Contact supplier.

Test process

High and low pressure gauges indicate same values.

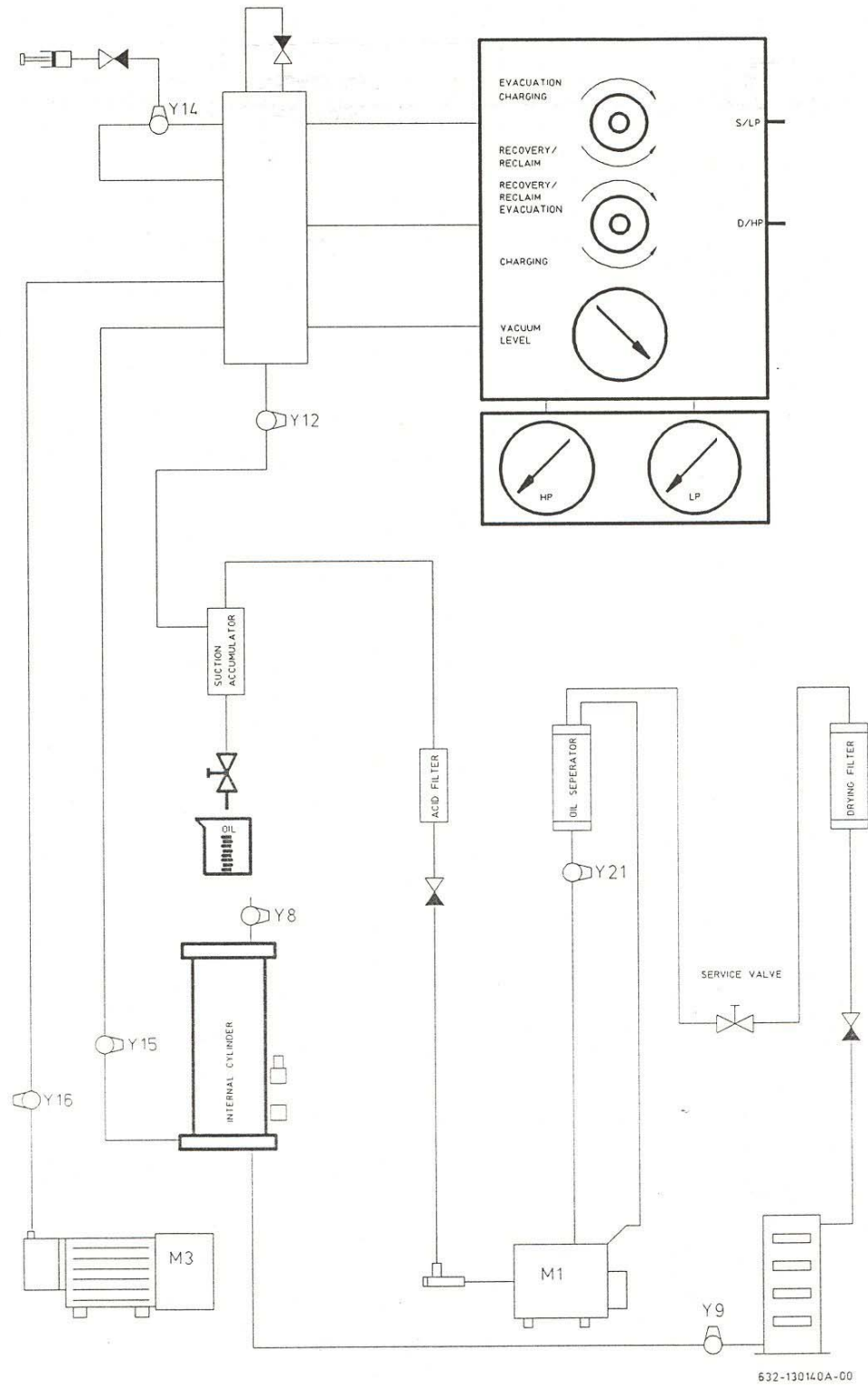
F: A/C unit not switched on.

R: Switch on A/C unit.

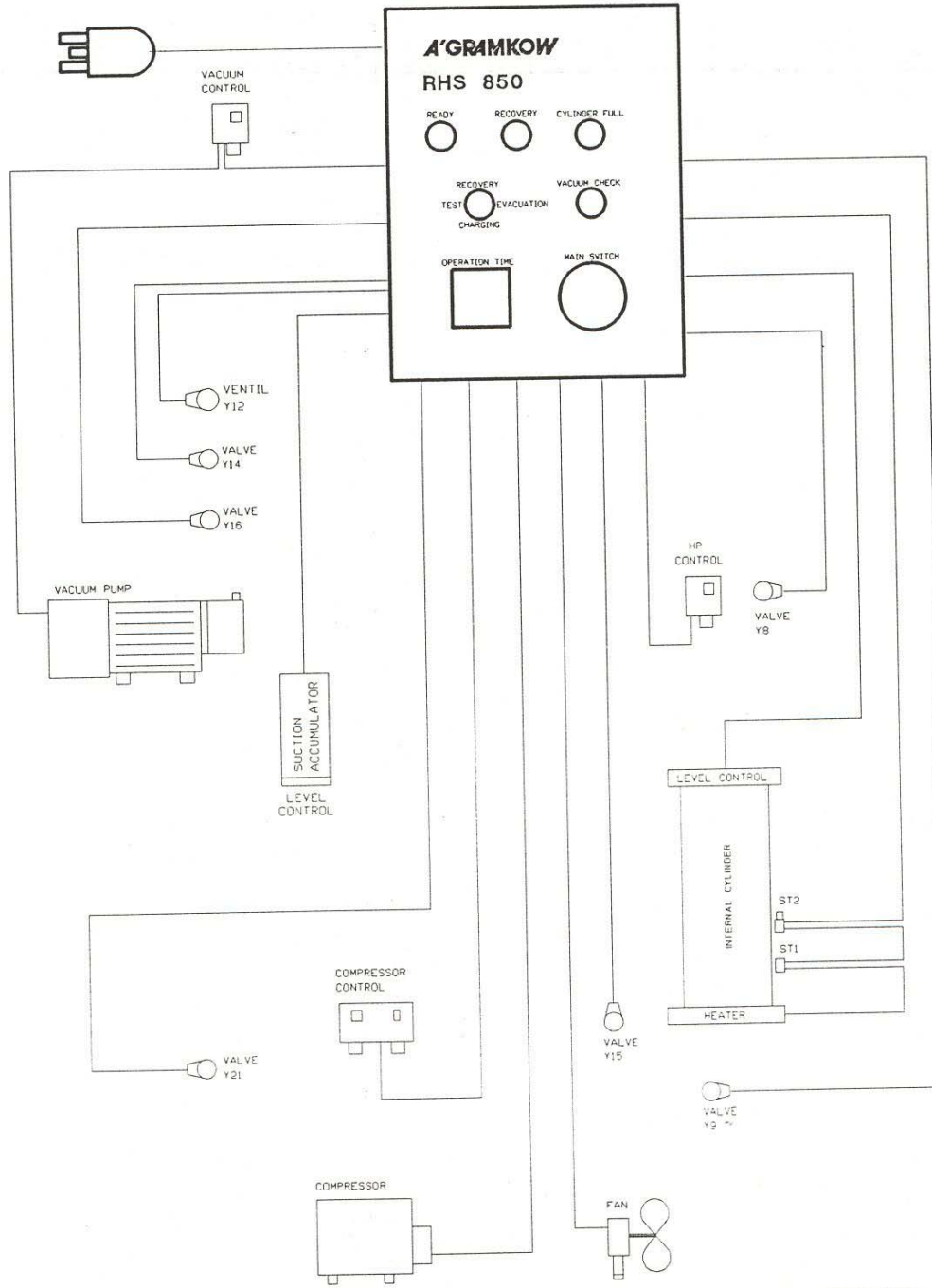
F: Compressor in A/C unit defective.

R: Replace faulty components.

11. FLOW DIAGRAM, MECHANICAL



12. FLOW DIAGRAM, ELECTRICAL



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