



# Enspeco

AUTOMOTIVE REFRIGERANT MANAGEMENT SYSTEMS

# RMS 5000

INSTRUCTIONS



**T**he Enspeco Refrigerant Management System 5000 provides fast and efficient recovery, recycling and charging of automotive air conditioning systems, meeting or exceeding the UL/SAE requirements. After extensive engineering design, field research and testing, The RMS provides a refrigerant recovery system that you will find easy to use and maintain.

**T**he following instructions will familiarize you with the RMS 5000 series and describe the function and position of its parts. We also provide a description of what is happening in the RMS 5000 during operation of each mode, so you fully understand the complete recovery process.

# Understanding your RMS 5000

Regulations now prohibit the venting of refrigeration gases to the atmosphere. These gases are harming the ozone layer, and are causing global warming. It is for everyone's benefit that HFC's, HCFC's and CFC's be recovered, and reused. The RMS Refrigerant Management System allows you to recover virtually 100% of the refrigerant and use it again or return it to be reclaimed.

**There are three basic functions that your RMS 5000 performs:**

**1. Total Refrigerant Recovery** - With a simple command, refrigerant from the vehicle being serviced will flow into the RMS providing recovery of the available refrigerant from the AC system.

**2. Cleans and Dries Refrigerant** - Once the refrigerant is in the RMS unit, the cleaning, oil separation, and filtration processes take place automatically. Once the refrigerant appears in the visual glass column, it has been cleaned and ready for reuse, meeting UL/SAE standards.

**3. Recharges Air Conditioner** - When servicing of the AC unit is complete, and the system is evacuated, the charging process takes place in one simple step, and the refrigerant is recharged back into the vehicle's AC system.

## Introduction

**Upon delivery of your RMS unit, it will have to be set up as follow before it can be used for recovery.**

1. (Optional) If purchased, install the recovery tanks on the back of the RMS, by strapping them to the back of the unit. (Figure 1)

**Note:** Always evacuate a new recovery tank before using.

2. Connect the hose from the back port of the recovery unit to the liquid port of the tank and only open the valve if the pressure in the onboard storage tank goes above 250 psig.

3. Connect the yellow umbilical cord to the electrical connector on top of the recovery tank (for overfill protection) (figure 2). Always unplug the RMS unit before doing this procedure.

**Note:** The recovery machine will not start or run unless the umbilical cord is connected to the tank and the Refrigerant Low Side Gauge shows more than 5 psig.

**Note:** When using an extension cord, never use longer than 50 feet and it must be at least 16/3 wire.



Fig. 1



Fig. 2

## When using your RMS

1. Position your RMS near the vehicle being serviced, and having the proper electrical outlet, plug in the RMS.
2. Periodically check the oil in the compressor by depressing the oil level port on the back side of the recovery unit (as in figure 3). If oil is not present, top it up or change it. A few psi of pressure will assist in checking the oil level.
3. Check the waste oil bottle for contents and note the level or empty it. Also make sure waste oil valve is closed.
4. Check the internal charging cylinder / condenser to see if it is empty. If not empty, record the amount or empty it. (As in figure 4)
5. When operating the RMS unit, safety goggles, protective wear and all state, provincial, and local codes of practice should be observed.

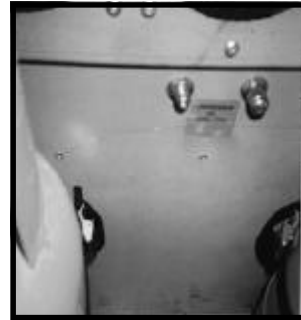


Fig. 3

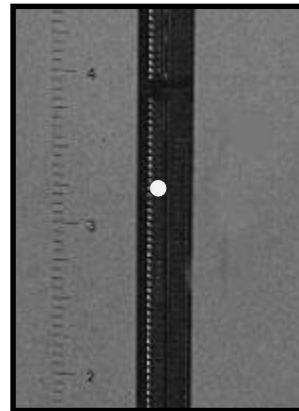


Fig. 4

# Installing the vacuum pump

1. Remove the front lower panel from the RMS unit. This will provide air circulation and space for the vacuum pump. (Refer to figure 5)
2. Position the pump and install the tie down strap around the pump so that the pump is securely fastened. With some models of vacuum pumps you may have to remove the handle in order for the unit to fit in the space provided. A plastic hose and an adapter is provided to replace the handle for the exhaust of the vacuum pump. A general purpose 115 Volts receptacle is provided. The vacuum pump should not be rated over 5.7 Amps.
3. Using a short approved refrigeration hose, connect the vacuum suction port of the pump to the 1/4" SAE flare connection on the RMS. These are located on the top left and top right corners in the front of the compartment. A reducer bushing may be necessary on some older style pumps which have 3/8" SAE flare inlets.

Note: When connecting the hose to the RMS, make sure to use the horizontal fitting and not the one pointing down. (Figure 6)

4. Plug the pump into the electrical outlet, and switch the vacuum pump to "ON" position.
5. Any mechanical valves which controls vacuum flow should be opened. Remember maintenance of the vacuum pump will be required from time to time, therefore, provision for removal should be considered now.



Fig. 5



Fig. 6

# Using your RMS 5000

The RMS 5000 is a dual refrigerant management system; actually two complete machines in one. They are totally independent from one to the other, although they share the same cabinet. This machine performs 6 basic functions: Diagnostic, Recovery, Air Purge, Evacuate, Before Charging and Charging. This recovery machine has an on-board manifold, which means no hose changes. It is highly recommended that all 8 valves showing on the face of the RMS be closed at all time except when in use and, always open the necessary valves before pushing the rocker switches in the “ON” position.

## Diagnostic

This mode is to determine if the car’s AC system needs to be recovered. Proper hose connection is essential for this procedure. The high side hose (red) must be connected to the high side of the AC system and the high side of the RMS 5000. The same applies for the low side hose (blue).

To diagnose the AC system, all the valves on the dashboard should be in the close position and the switches in the off position. By running the car’s AC system, the pressures will be indicated on the gauges (figure 7).

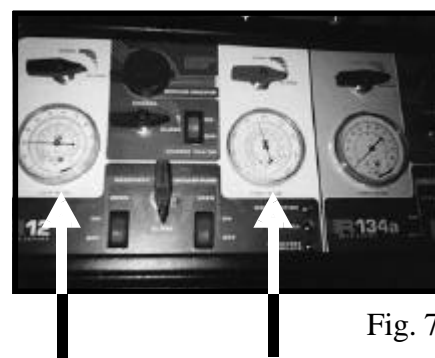


Fig. 7

## Recovery

The recovery mode removes the refrigerant from the car, cleans it and stores it into its onboard charging cylinder.

Make sure all hoses are connected properly and open both “HIGH” and “LOW” side valves to allow refrigerant to flow into the RMS 5000. With the RMS plugged into a 120V receptacle, turn the Recovery valve to “RECOVERY” and push the Recovery switch to “ON”. (Figure 8) Refrigerant will flow from the car to the recovery machine while being filtered, the quantity of recovered refrigerant will show on the glass column in front of the machine. When recovery is completed the machine will stop and a light will indicate recovery complete; all valves should be closed. Wait a minimum of one minute before pushing the recovery switch to “OFF”, this will allow the pressurization of the waste oil compartment.

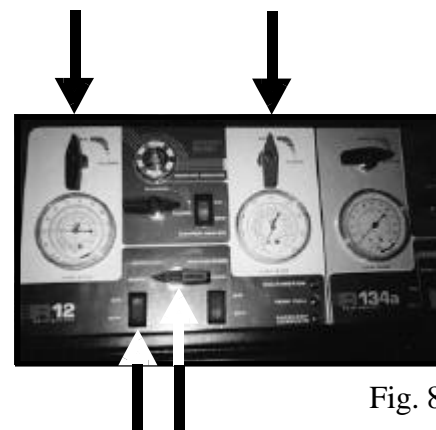


Fig. 8

Once recovery is finished the waste oil should be emptied into the waste oil bottle, on the back of the RMS, by opening the control valve next to the clear tube going into the oil bottle. Close valve immediately after oil stops dripping.

# Using your RMS 5000

## Air Purge

Sometimes non-condensable gases (air) finds its way into the charging cylinder and must be purged.

To purge the air one must look at the gauge located on the side of the RMS next to the onboard charging cylinder which needs to be purged; then press on the push button which is under that gauge. (Figure 9) The button should be pressed until the pressure reading on the gauge stops dropping or until the first bubbles appear in the liquid column in front of the charging cylinder. This purge should be done at a minimum of 10 min. after recovery is completed or before charging the AC system.

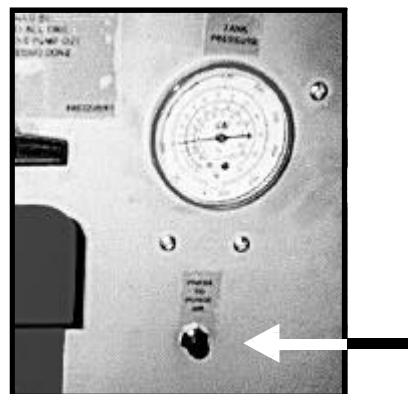


Fig. 9

## Evacuation

After all the repairs have been completed, the AC system should be evacuated before being recharged. With the “HIGH” and “LOW” side connected, make sure that no pressure is indicated on the low and high side gauge, this would indicate that there is some refrigerant or nitrogen pressure in the AC system and should not go through the vacuum pump.

To evacuate turn both “HIGH” and “LOW” side valve to open and the lower valve to “Evacuate”, then the evacuate switch should be pushed to “ON”. (Figure 10) After evacuation is completed, close all valves, then switch off the vacuum pump.

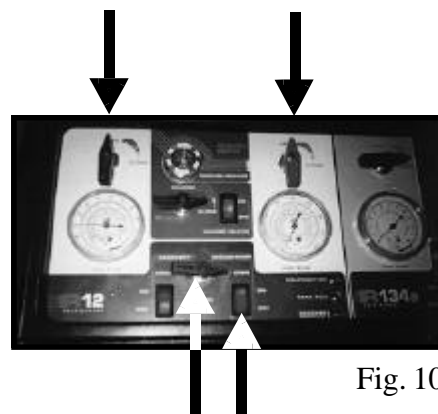


Fig. 10

# Using your RMS 5000

## Before Charging

Before charging the AC system one should make sure that the right amount of refrigerant is in the on-board charging cylinder. If there is more than the necessary amount to be charged, one should use the white plastic markers to indicate starting and ending level on the glass column. If there is not enough refrigerant in the on-board charging cylinder, it should be filled up to the required amount. Again the plastic markers should be used to indicate the amount.

There are two ways to add refrigerant to the on-board charging cylinder.

1. It can be added to, like a regular charging cylinder.

Before doing so one should wait until the temperature of the charging cylinder stabilizes and make sure there is no non-condensables (air) inside.

Open the liquid valve of the refrigerant tank in the back and press on the air purge button on the side of the RMS. (Figure 11) This has the same effect as depressing the schrader valve on top of a regular charging cylinder. The charging cylinder should start to fill up.

2. If someone can't wait for the pressure on the on-board charging cylinder to stabilize, it can be added by "RECOVERING" refrigerant from the storage tank in the back of the RMS. To do so one should take a hose from the liquid port of the tank and hook it to the "LOW SIDE PORT" of the RMS. The liquid valve of the tank should be opened and proceed as in normal recovery using only the "LOW SIDE VALVE". Care should be taken to throttle the low side valve from the face plate so that the on-board charging cylinder doesn't get more refrigerant than needed. Once the proper amount is almost achieved the liquid valve of the back tank of the RMS should be closed and allow recovery to be completed.



Fig. 11

# Using your RMS 5000

## Charging

Charging the AC system can only be done after the evacuation has been completed.

Charging is done by opening the “CHARGE” valve and the “HIGH” side valve to allow refrigerant to go from the charging cylinder to the car. (Figure 12) To help the process there is a heater under the charging cylinder, which can be turned on by pushing the “CHARGING HEATER” switch. The amount can be monitored through the glass column. Above the charge valve is a moisture indicator sight glass which indicates if the refrigerant is dry or wet, if it indicates caution filters and oil should be changed. After charging is completed close all valves.

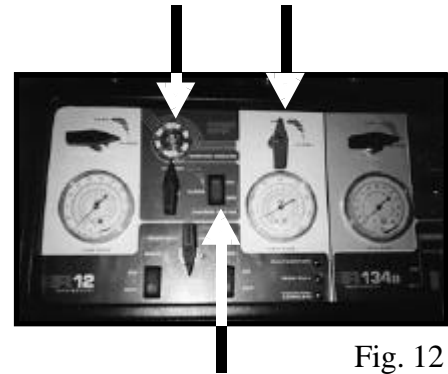


Fig. 12

## Adding refrigerant to a car while it is running

If a car has received a charge of refrigerant and it needs more, it can be done with the built-in manifold. With all valves closed the performance of the AC system will be monitored. Refrigerant can be added from the onboard charging cylinder or if it is empty the tank in the back can be used.

To add refrigerant from the on-board storage cylinder, open the “CHARGE” valve and trickle refrigerant by opening the “LOW” side valve slightly like it was done in the past with a manifold and a refrigerant tank. (Figure 13) To add refrigerant from the tank in the back, open the liquid valve on the tank and do the same thing as with the on-board charging cylinder.

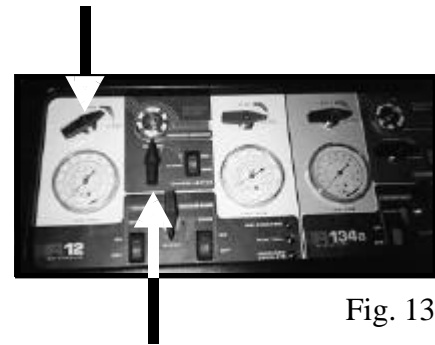


Fig. 13

# Maintenance

## Filter change

The filter should be changed at typically every 30 hours of operation or if the moisture indicator shows caution. For best results the filters should be Part # EKH-303 from The Service Depot or equivalent.

1. Run the RMS in recovery mode.
2. Once recovery is complete and the indicator light comes on, immediately turn off the RMS and unplug the electrical cord. Remove the filter by removing the nut from the bottom of the filter (as shown in figure 14). You can now unscrew the filter from the top brass fitting.
3. To install a new filter, remove the cap from it and put a small amount of REFRIGERATION OIL on the threads and the flare part of the filter (this will eliminate the tendency to damage the O ring in the brass fittings). Also, inspect the O rings in the fittings before proceeding to screw in the new filter.
4. Install the filter, making sure that the arrow is pointing down. (As shown in figure 15)

**Note:** Do not over tighten. Simply make sure that they are hand-tight.



Fig. 14



Fig. 15

# Maintenance

## Compressor Oil change

The oil should be changed at typically every 200 lb. of refrigerant or if the moisture indicator shows caution.

1. With both “HIGH” and “LOW” side valves closed, run the RMS in the recycling mode for a few minutes (see next page). As soon as the recovery complete light goes “ON” the “RECOVERY SWITCH” should be pushed in the “OFF” position. Hook a hose ( with depressor end ) to the compressor drain port and an approved waste oil container, (compressor drain port is located on the left side of the RMS for the R12 and on the right side for the 134a). Now push the RECOVERY SWITCH to the “ON” position for a few seconds. The compressor will not start but will allow the oil to drain out through the drain port. (figure 16).



Fig. 16

**Note:** Always drain the oil when it is hot, it will drain much better. You can also introduce some air pressure through the oil check port to help push the oil out (never any more than 5 to 10 PSIG).

2. Using an oil pump connected to the oil fill port, replace with 10 oz. of appropriate oil as listed below:

#30501 Polyester oil

**Warning:** Protective apparel, gloves and safety goggles should be worn while servicing your RMS. Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove HFC-134a from the A/C, UL suggest the use of service equipment certified to meet the requirement of SAE J2210 (HFC-134a recycling equipment, where required. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

# Advance Features

## Recycling

This RMS is designed to bring refrigerant to UL SAE standard in a single pass. If, for some reason or another, someone wants to have the refrigerant go through the filters more than once i.e. recycling, it can be done very easily.

Have both high and low side valves closed, then open both recovery valve and charge valve. Push the recovery switch “ON” to start the compressor. (Figure 17) Refrigerant will go down in the glass column and may even disappear, this is normal. To terminate recycling close the charge valve and wait until recovery is complete. All refrigerant should reappear in the glass column. One can see the refrigerant go through the sight glass on the face above the “CHARGE” valve and see how dry the refrigerant actually is. This process can be used to pressurize the refrigerant prior to charging.

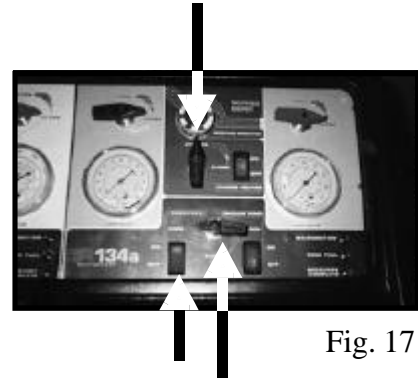


Fig. 17

## Pump-out

The RMS 5000 is equipped with a pump-out device which is design to remove the residual vapor which is present in the on-board R12 charging cylinder and dump it into the storage tank in the back of the RMS.

1. Open the liquid valve on the tank and turn on the “CHARGE HEATER” switch until no more liquid is present in the glass column, then turn off the charge heater switch.
2. Turn the pump-out valve which is on the right side of the RMS (Figure 18) to the position “PUMP-OUT”.
3. Make sure all other valves are closed and then push the recovery switch to “ON” to start the compressor.
4. Once the recovery complete light goes on, the onboard storage cylinder will be in a vacuum and the pump-out procedure is finished.
5. Push the “RECOVERY” switch to “OFF” and make sure that the pump-out valve is turned back to “RECOVERY” when the pump-out procedure is finished. Close tank valve.



Fig. 18

# The RMS Warranty

## Limited one year warranty

Please carefully read the following warranty and the operating instructions that are provided for your convenience to demonstrate the proper use, care and maintenance of your Refrigerant Management System (RMS) unit.

## What is covered

The RMS warrants the unit to be free of defects in material and workmanship for one year from the date of purchase; warranty is made only to the original enduser. Warranty only applies to equipment which is operated and maintained in accordance with The RMS's written instruction or within applicable industry standard.

## Length of warranty

This warranty is in effect for 12 months from the enduser purchase date. Proof of purchase date is required.

## What is not covered

The RMS is not responsible or liable in contract or tort for special, indirect, punitive or exemplary damage, lost profits or consequential damages (the cost of repairing or replacing other property which is damaged when this equipment is not used properly) by reason of the unit's mechanical or electrical failure or the unit being used in violation of the operating instructions.

The RMS is not responsible for oil, filters, manifold seals or the cleaning of the unit necessary to perform the service repairs.

The RMS does not cover the loss of time, loss of use, labor, equipment rental or other incidental damages while unit is out of service.

The application of The RMS's equipment is the responsibility of the purchaser.

# The RMS Warranty

## The RMS does not cover:

- a) Units showing evidence of abuse, misuse, improper application.
- b) Unit repair needed due to normal wear and tear.
- c) Units showing signs of unauthorized alteration.
- d) Units which have been resold as used.
- e) Units used in violation of the operation instructions.
- f) Units shipped from the factory more than 18 months prior to becoming defective.
- g) Freight to and from the service center.

## What The RMS will do

In the event of a defect in the warranty period The RMS at its opinion, may either repair or replace the defective unit free of charge.

## How to get service

The RMS has established warranty service centers throughout North America. Should a unit become defective in the warranty period it must receive a Return Goods Authorization number (RGA#) prior to returning it to a service center for repair. Simply fax or mail a copy of The RMS's return authorization form with the appropriate information filled in, and our warranty department will respond with an authorization number and shipping instructions to the nearest service center.

Warranty products must be shipped prepaid to the service center. Returns sent to the service center without an RGA# will be refused.

## Disclaimer

The RMS makes no other warranty of any kind whatsoever, either expressed or implied. All implied warranties of merchantability and fitness for a particular purpose which exceed the afforested obligations are hereby disclaimed by The RMS and excluded from this warranty.

## How provincial law relates to this warranty

Some provinces do not allow exclusions or limitations of incidental damages, so the above limitation may not apply to you. Some provinces do not allow limitations on how long an implied warranty lasts, so the above may not apply to you.

# The RMS Warranty

This warranty gives you specific legal rights, and you may also have other rights which vary from each state or province. This written warranty constitutes the final, complete and exclusive statement of warranty terms and no person is authorized to make any other warranties or representations on behalf of The RMS.

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