

CM2000

OPERATING MANUAL OF REFRIGERANT  
RECOVERY



## Important Safety Instructions

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### **WARNING!**

Pressurized tank contains liquid refrigerant. Overfilling of the tank may cause violent explosion and possible injury or death. Use only authorized refrigerant tanks. Referring to this instruction manual for tank specification. Do not recover refrigerants into a non-refillable storage container!

All hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause injury. Always wear safety goggles and exposure suit when working with refrigerants. Disconnect hoses with caution.

High voltage electricity inside panels has risk of electrical shock. Power should cut off before servicing unit.

To reduce the risk of fire, avoid using of an extension cord because the extension cord may overheat. When using an extension cord it should be a 14AWG minimum and no longer than 7.6 meters, or it may make the voltage drop and damage the compressor. Do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Use this equipment in locations with mechanical ventilation that provides at least four air changes per hour or locate the equipment at least 18 inches above the floor. Make sure that all safety devices are functioning properly before operating the unit. Please follow the instructions in this operating manual, before operating.

### **CAUTION!**

**SHOULD BE OPERATED BY QUALIFIED PERSONNEL.** Operator must be familiar with air conditioning and refrigeration systems, refrigerants and the dangers of pressurized components.

This equipment is not designed for any other purpose than recovering refrigerant.

## OPERATING NOTES

The voltage at the unit must be  $\pm 10\%$  of the unit's rated voltage.

Do not overfill the storage tank. Tank is full at 80% of the volume.

Do not mix different refrigerants together in tank, as they could not be separated or used.

Provide good ventilation around the working area and prevent the operators from inhalation of the refrigerant or lubricating oil steam.

HFC-134a service equipment or vehicle A/C systems should not be pressure-tested or leak-tested with compressed air. Some mixtures of air/HFC-134a have been shown to be combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing injury or property damage.

Additional, health and safety information may be obtained from refrigerant and lubricant manufacturers.

## Requirements of the Recovering Tank

Accessories of the unit do not include tank. The lowest pressure is 3.8Mpa.

Before connecting the recovery unit to tank please make sure:




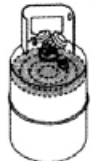
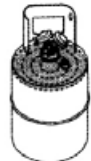


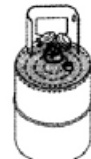


- The air inside the tank has been vacuumed.
- With the clearly sign of refrigerant type in the tank
- Make sure the tank not be overfilled. (E.g. put the tank on the scale or use the protection switch of over-filling, etc.)

## Maximum content for standard tank

Refrigerants content	30 lb. Tank	50 lb. Tank
R12	22 lbs./10.0kg	40 lbs./18.0kg
R22	22 lbs./10.0kg	40 lbs./18.0kg
R134a	22 lbs./10.0kg	41 lbs./18.5kg
R407C	21 lbs./9.5kg	39 lbs./17.5kg
R410A	19 lbs./8.5kg	36 lbs./16.0kg

## WARNING

Do not exceed 80% of tank capacity, as it would be likely to cause injury or death.

CYLINDER TEMPERATURE	16°C	21°C	38°C	54°C	66°C
STARTING WITH CYLINGER 80% BY VOLUME					
SPACE OCCUPIED BY LIQUID	80%	81%	83%	90%	94%
STARTING WITH CYLINGER 80% BY VOLUME					
SPACE OCCUPIED BY LIQUID	90%	92%	96%	100%	

## Specifications

Model	CM-2000
Compressor	1/2HP Oil-less
Power Input	400W
Overload Protection	5A
General Quality	16.8kg
Vapor Recycle	≤16.8kg/h
Liquid Recycle	≤120 kg/h
Pull/Push Recycle	≤385 kg/h
Power Supply	220V/50HZ 1PH
Intake Pressure	-0.05 ~ 15bar
Purge Pressure	0 ~ 38bar
Operating Temp.	0°C-40°C
High pressure Shut-Off	38bar hand-stirred reposition pressure 30bar
Dimension	480mm(L)×220mm(W)×370mm(H)
Refrigerants	R12/R134A/R401C/R406A/R500/R401A/R409A/ R401B/R412A/R411A/R407D/R22/R411B/R502/ R407C/R402B/R408A/R509/R407A/R404A/R402A/ /R507/R407B/R410A

Remarks: the recovery rate is measured by manufacturer. Numerical value may be varied based different conditions.

## Introduction

CM2000 series refrigerant recovery machine is designed just for refrigerant air-conditioner maintenance equipment in Euro-American market. It is a new recycle-injection product that is suitable for varied kinds of refrigerants.

The CM2000 is mainly applicable to household air-conditioner, commercial air-conditioner and central air-conditioner etc. It can carry on recycle and injection of III, IV, V categories of refrigerants including R12, R22, R134A, R407C, R410A etc. Because of its excellent function and outstanding qualities, it gains full affirmation of the distributors and customers. No doubt, it is professional choice for professional.

### Main characteristics

- Ergonomic well balanced design with good shape
- Pull rod design, which is convenient for carrying
- Proprietary oil-less lubrication compressor, capable of handling varied kinds of refrigerants
- “Super Cool” fan and efficient condenser design provides fast speed in recycle and injection
- Multi-function valve design and self-purging function
- The outer shell adopts one-off rotary technology with high intensity and concussion resistance
- Overall protection device, safe credibility
- Large filter outlay design, which is convenient for replacing

## Direct Liquid or Vapor Operation

1. Connect the pipeline according to the diagram, and put the tank on scale.

2. Connect vent-pipe with the liquid port of the tank. Open the liquid valve on the tank.

3. Connect the yellow pipe of pressure gauges to the input valve of the recover machine.

4. Connect the high low pressure tube of the manometer set to the corresponding port of disposal system.

5. Open the valve of low pressure gauge. (First, liquid recycle from the system can expedite recycling speed.)

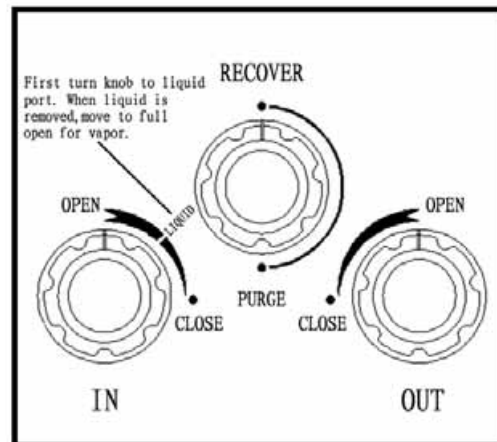
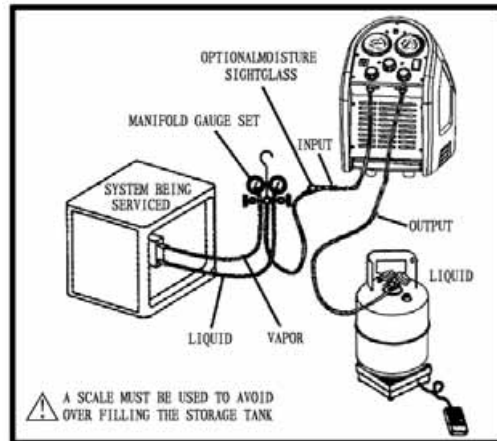
6. Place the Recover/Purge valve door of equipments panel on Recover.

7. Open the output valve of the recycle machine.

8. Switch on the power supply. And the compressor is ready for running.

9. Slowly open the input port. If the compressor starts to knock, slowly throttle back the input valve until the knocking stops. Turn on input valve completely when liquid refrigerants are recycled completed. (Should open the high pressure valve on the pressure gauge at this time.)

10. When the system manometer manifests that the pressure has attained appropriate vacuum, turn off the high low valve of the unit. Then turn off input valve and power of the recycle machine. Recover to this complete.



11. During recycle procedure, if the tank has already been filled with 80% of its capacity, please stop recycling and change an empty tank.

12. If the pressure of the tank is over 20bar, adopt cooling way to improve recycling speed. (Specific operations please refer to the part of decompression and reduction the heat of the tank.)

## Liquid Push-Pull Operation

1. Connect the pipeline as the diagram indicates. And put the tank on the scale.

2. Switch the recycle/purge valve to the position of "PURGE".

3. Turn on the purge valve.

4. Turn on power supply.

5. Switch on input valve.

6. The equipment starts to transfer liquid refrigerants. Please pay attention to increasing weight showed by the scale.

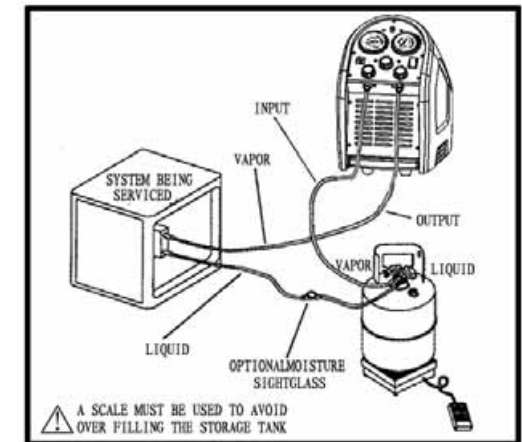
7. If case the displayed tank weight stop increasing close the recycling switch.

8. Turn off all valves.

9. Connect pipeline and execute the gas recycle procedure according to Direct Liquid or Vapor Operation.

**Caution !** When using the "Pull/Push" method, a scale must be used to avoid

overflowing the storing tank. **Caution :** Once the siphon is started, it can continue and overflow the storage tank is equipped with a float level sensor .The siphon can continue even when the machine is turned off. You must manually close the valves on the tank and the unit to prevent overflowing of the recovery tank.

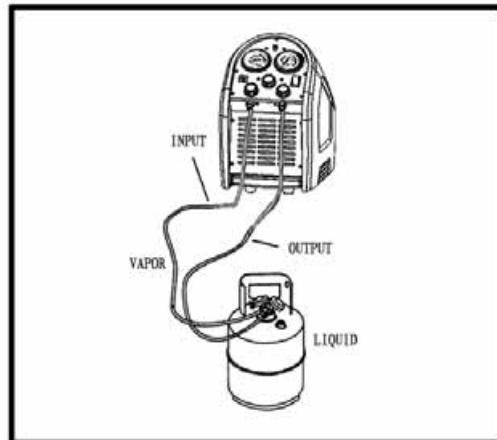


**Caution :** The function is suitable for the large-scale system; also its refrigerant gathered in one place (liquid state) is advantageous for extracts. The system whose capacity is smaller than 15 pounds (approximately 7kg) may not use. In order to achieve the maximum rate of recovery please use 3/8" or a thicker hose, the length of which is as short as possible. And we suggest you use the pipe below 90cm. Demount all the nonessential valve core and valve shaft to achieve the maximal-flow speed. Distorted rubber seals, the nonessential valve core and the valve shaft can limit the rapidity of circulation and may reduce it to 90% most greatly. If the pressure inside the container surpasses 300psi (approximately 20bar), please carry on the temperature decrease operation to it to reduce the head pressure.

## Recovering Tank Cooling Method

Using cooling method to lower the tanks pressure, in this way, recycle speed can be increased. Connect the pipeline as the diagram indicates. This operation can be repeated.

**Attention:** If there is no liquid refrigerant in storing tank, the operation cannot attain your purpose. Under this kind of circumstance, please use the completely bare storing tank in order to reach the needed vacuum degree.



## Tank Cooling Procedure

1. To start you must have a minimum of 2.5kg refrigerant in the tank.
2. Turn the Recover/Purge valve to the Recover position.
3. Open the Vapor and Liquid valve of the tank. And turn on the input/output valve to start the recycling machine.
4. Switch the input valve to the position of LIQUID.
5. Throttle the Output valve of the unit so that the output pressure is 100psi greater than the input pressure, but never more than 300psi.
6. Run until tank is cold.

## Self-Purging Operations

### Self-purging your CM2000

1. Close the input port on the CM2000.
2. Turn off the CM2000.
3. Turn the Recover/Purge valve to the Purge position.
4. Restart the CM2000.
5. Run until desired vacuum is achieved.
6. Turn the CM2000 off.
7. Close the ports on the recovery tank and the CM2000.
8. Return the Recover/Purge valve to the Recover position.
9. Disconnect and store all hoses.

## Routine Maintenance

1. A dry filter must always be used and should be replaced frequently. And each type of refrigerant must have its own filter. For the sake of assuring the normal operation of the unit, please use the filter specified by our company. High quality dry filters will bring high quality services.
2. If the unit is to be stored or not used for any length of time, we recommend that it be completely evacuated of any residual refrigerant and purged with dry nitrogen.
3. Special care should be taken when recovering from a “burned-out” system. Use two high acid capacity filters, in series. When you have finished recovering from the system, flush the unit with a small amount of clean refrigerant and refrigerant oil to purge off any foreign substances left in the unit.
4. After recovering, make sure there’s no refrigerant left in the unit. Read the Self-Purging Method carefully. Liquid refrigerant remained may be expanded and destroy the components.

## Troubleshooting Tips

PROBLEM	CAUSE	ACTION
The machine does not run when power switch is in “ON” position.	Power supply cord not attached or no power.	Check the power supply at job site.
	Voltage is not right.	Check voltage is in “ON” position.
	The circuit breaker has cut off.	Press the button to reset.
Fan runs but compressor does not start when the start switch is in “ON” position.	The unit is in high pressure shut off.	Reduce pressure and then press the button of the High Pressure Switch.
	The compressor is in over-heat shut off.	Auto-restart when the motor is cool’.
	Failure in compressor.	Factory service required.

PROBLEM	CAUSE	ACTION
Recovery process too slow.	Intake pressure is too low.	Improve the intake compressor.
	Purging pressure is too high.	Low the purge pressure.
	Pipeline is jammed.	Check the pipeline.
	Compressor seals are worn.	Factory service required.

## Warranty

This product is warranted to be free from defects in workmanship, materials, and components for a period of one year from date of purchase. All parts and labor required to repair defective products covered under the warranty will be at no charge.

The following restrictions apply:

1. The limited warranty applies to the original purchaser only.
2. The warranty applies to the product in normal usage situations only, as described in this operating manual. The product must also be serviced and maintained as specified.
3. If the product fails, it will be repaired or replaced at the option of the manufacturer.
4. The manufacturer shall not be responsible for any additional costs associated with a product failure including, but not limited to, loss of work time, loss of refrigerant, and unauthorized shipping and/or labor charges.
5. All warranty service claims must be made within the specified warranty period. Proof-of-purchase date must be supplied to the manufacturer.
6. Use of this recovery equipment with unauthorized refrigerants will void our warranty. Authorized refrigerants are listed on the equipment or are available through our Technical Service Department.

This Limited Warranty does not apply if:

- The product, or product part, is broken by accident.
- The product is misused, tampered with or modified.
- The product is used for recovering any substance other than the specified refrigerant type.