Refrigerant Recovery Unit Operation Manual



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Refrigerant Recovery Unit

Safety instruction

1.Before operating, read safety instruction carefully.

2. This product only use by professor or instructed by engineer.

3. When operating, please wear safety goggles and protective cover to prevent skin and eyes are cooling the refrigerant gas and erosion, and avoid contact with corrosive liquids and gases

4.Do not use machine under sun and rain.

5.To ensure that the operating room ventilation.

6.Use authority approved refrigeration tank, tank requires a minimum operating pressure 27.6bar

7.Please do not store full cans, containers can only be loaded to 80% by weight, the need to retain some space to prevent the expansion of the liquid. If overfilled containers, may cause an explosion.

8.Operating pressure should not exceed as recovery tank specified.

9.Do not mix different refrigerants in a container, otherwise it can not be separated or used.

10.Before recovering refrigerant recovery tank should achieve the vacuum level: -0.1mpa to remove non-condensable gases. Because each tank is filled with nitrogen factory, before the first use of nitrogen to be excluded clean.

11. When not in use, it should close all the valves, because the air or moisture may affect the results of recovery and shorten the life of the machine.

12. When using an extension cord, wire requires a minimum 1.29 square feet, and the length less than 7.6 meters, otherwise it will cause a voltage drop, damage to the compressor.

13.To use a dry filter, and frequent replacement; each type of refrigerant corresponding filter, in order to ensure that it works, please use the designated

filters, high-quality filters bring quality services.

14. When recovering from a "burned out or run too long" system, the need to pay special attention to the continuous use of two highly acidic filter; when the recovery is complete, a small amount of clean refrigerant and refrigerant oil to flush may remain within the clear recycling machine dirt.

15. This machine has an internal pressure protection, if the pressure inside the system exceeds 38.5 bar, the system will automatically cut off.

16.If the container pressure exceeds 20.7bra, please use storage containers cooling method to reduce the tank pressure.

17.In order to achieve maximum recovery rate, use the possible size 3/8 " or larger short hose, it recommended no more than 0.9 meters of hose.

18.To recycle large quantities of liquid, use the liquid push / pull method. 19.After recovery, do not leave residual refrigerant internal; carefully read the self-purification method; liquid refrigerant left inside the machine can expand and damage the components.

20.If the machine needs to be stored for a long time or not, please complete removal of residual refrigerant and purged with nitrogen machine.

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II、 Specifications

Model HBS-1A(LRR-1A) HBS-2A(LRR-2A) Horizontal bar oil-free, Parallel bars, oil-free, Compressor air-cooled air-cooled Motor 1/2HP 1HP Voltage 220-240V50Hz / 110-115V60Hz Operating Speed 1440RPM@50Hz / 1720 RPM@50Hz Maximum current 5A/8A 10A/15 A **High Voltage Power Off** 38.5bar/385okpa(558psi) **Operating Temperature** 0-40 CAT.III: R-12, R-134a, R-401C, R-406A,, R-500 CAT.IV: R-22, R-401A, R-401B, R-402B, R-407C, R-407D, Refrigerant R-408A,R-409A, R-411A, R-411B, R-412A, R-502, R-509 CAT.V:R-402A.R-404A, R-407A, R-407B, R-410, R-507, R32 Refrigerant 5 19 Steam Recovery 0.23KG/MIN 0.25KG/MIN 0.25KG/MIN Efficiencv Liquid 1.57KG/MIN 1.81KG/MIN 1.81KG/MIN Push/Pull 4.64KG/MIN 5.57KG/MIN 5.57KG/MIN 46mm(L)*226mm(W)*346mm(H) 15Kg Net Weight 14.5Kg **Chart and Catalogue** $\| \|_{\infty}$ ITEM ITEM Explanation Explanation Blanket Belt 16 Floating sensor socket Package with bolt 17 Pressure.liquid saturation indicator 2 5

3	Plastic Shell	18	Power Outlet
4	Condenser	19	Recycling, purge valve knob
5	Fan Cover	20	Input Valve Knob
6	Capacitor Box	21	Output Valve Knob
7	Compressor	22	Surge Protector
8	Control Valve Assembly	23	Axial Fan
9	Output	24	Bottom, Rear control panel
10	Input	25	Feet Rubber Shock Pad
11	Front Control Panel	26	Filter
12	Output Pressure Gauges	27	Short Hose
13	Input Pressure Gauges	28	Power Cable
14	Start up Switch	29	Pressure Guard Cable
15	Switch	30	Brass

(Picture1)



IV, Electrical Circuit Diagram



$oldsymbol{\Xi}$ 、 Instruction, Preparation before operating

1. Operation Environment

•Before transportation and evacuation, consider the following circumstances

- a: Do not use recovery unit nearby water or rain, the unit contains a fan, may inhale water.
- b: To reduce the risk of suffocation due to CFC (refrigerant) leakage caused, please do not use the recycling unit in enclosed spaces.
- c: To avoid the decomposition of the light, keep away from fire.
- d: Recycling unit does not allow recovery of combustible gases (hydrocarbons or hydrocarbons series) when recovered CFC

(refrigerant) Inclusion of combustible gases including ammonia and hydrocarbons (propane and isobutene), there may be an explosion or fire.

•Before use, please read the following notes carefully

a; Extraction hose often from CFC recovery unit, vacuum recovery vessel (hereinafter referred to as recycling machines, hose and container).

b; When you start recovery unit, ensure that the input valve is closed (see Figure 1).

- c; Recovery Unit may produce an unusual sound, which is a large number of wet CFC (Freon) into the produce within the compressor, close the inlet valve (see Figure 1) until the audible sound disappears.
- d ; When the operation need to stop, do not turn off the outlet valve and the container valve, do so, recovery unit at high pressure may damage the table. First turn off the menu and its recycling machines input valve (Free), turn off the Recycle power switch and close the outlet valve (high pressure side).
- e ; When the ambient temperature is high or R410A is recovered when the temperature of the container also rises. Lowering the temperature or pressure vessel. Refer to "Important Information" point 4, and "Recycling R410A and high pressure CFC methods."
- f; Prevent air from entering the inner hose and the container, if there is air in the container, open the gas valve exhaust. Before CFC is discharged only release gas
- g; When recovery contains a large number of CFC oily, use oil separator, recovering a large amount of oil can damage the compressor.
- h ; After using caulk, not recovering CFC from refrigeration systems. Caulk exposed to air or moisture will condense over

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time or harden, will cause the compressor and valve blockage and damage to the compressor.

i; Do not pull vacuum when recovery unit is running, a long running under vacuum may damage compressor.

2 Transportation

a; Disconnect before shipping and container recovery unit.

b; When transporting containers containing CFC, in particular, be careful weight.

3、Container

- a; In the evacuated container before use (Figure 3)
- b; Container is designed for recovery unit only, without using the specified container may cause excess refrigerant recovered or issues.

c; Inside the new container have nitrogen, evacuated prior before use, open the gas valve to exclude nitrogen.

d; Do not filled with CFC container was evacuated, which leads into the CFC Air and pump oil ejected.

e; Do not pull vacuum when container is running, it may damage compressor running under vacuum.

f; With hose "Connect" gas pump inlet valve and container.

- g; Start the pump " ON"
- h; "Close" and the liquid valve "open" gas container valve.

i; When the vacuum reaches -0.095 \sim -0.1MPa., "Turn off" the gas container valve.

j; Close pump "OFF".

k; "Off" "connection skin tube



4. Important Information

How to shorten recovery time

a: After recovering the liquid, liquid and gas ports are recovered.

b; Be recovered if the spool on the outlet end of the system, removed.

c; The suppression was removing the skin tube.

d: Use the hose inner diameter greater than 3/8 "

e: Replace skin tube if damaged.

f; After the system is recovered crankshaft heater is energized product is recovered.

g: If the accumulator and other components condensation, using a heat gun.

How do temperature or pressure vessel rises

1 Use a separate cooler for sale.

2 Reduce the pressure input valve end of the recovery unit.

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- ③ Replace the new recycling containers.
- ① Reduce the temperature by cryogenic cooling.
- ⑤ Use the 120L container.

六、General recovery method

1. Hose and connecting the power supply (Figure 4) (Figure 4)

When using a rain sensor container When using ordinary container



- a: This is the basic method for recovering.
- b: After skilled in this method than use other recover method(such as push-pull method) .
- c; According to the above connecting hose.
- d: The safety line or container limit meter "connection.
- e; Only after the safety line connected, recovery unit to start.

 $f_{\rm f}$ Use filters to achieve cleaner recovered, carefully check the direction of installation

g; When blocked or recovered over 60kg, please replace a

Refrigerant Recovery Unit new filter Recovery unit and exhaust hose 2、 (Figure 5) Prwer Switch Start Switch (5) Open 4 Open Clos LowPressure H igh P ressure (1)Open Open (1) Outlet Valve Open Input (2) Open 2 Open Clos Liquid Valve Gas V alve Low Pressu

Low Pressure High Pressure System Menubar (Optional) Recovery Vn it Cose Close Close High Pressure Cose Close High Pressure Recovery Vn it Cose Close High Pressure Cose Close Hold Tightly With Floating With Floating

•Valve operation (Figure 5)

- ① Open the high and low pressure valve on dual table
- ② Open the inlet valve on unit, adjust the (recycling, clear) valve to recycling, open the outlet valve
- (3) Disconnect the hose and container liquid end (seize the hose)

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Operation

(4) Turn the power switch" ON"

- ⑤Press the start switch "ON"
- ⁽⁶⁾When the gauge reaches the suction vacuum, close the input valve recovery unit, recovery unit adjusted to the switch valve cleaning.
- O When the gauge reaches the suction vacuum hose
 - connection end of the container with the liquid off again.
 - Complete

Turn off the recovery unit "OFF"

3, Recover Operation

a; When recovering the liquid using a high pressure side, when recovering gas, the use of the low pressure side of the system

b; When recover a large amount of refrigerant (more than 5kg) one time, using a high pressure side (CFC)

c; When recover gas in summer, if the pressure is too high inside, adjust the dual table valve, to reduce the inlet pressure to 0.3MPa



•Valve operation (See Figure 6)

①Close input valve on recovery unit.

(2) Adjusted value to recover switch(recycling, clear).

③Open container of liquid valve and outlet valve recycling machine.

④Open the high-pressure side and double table system.

•Operation

- (5) Recycling power switch "ON",
- (6) Press the start switch "ON".
- ⑦ Open the Inlet valve of recovery unit slowly.
- (a) Open the low side table and double system, when the liquid recovery is complete, the adjustment to the gas recovery.

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● Complete

(9)When the low pressure side reached the rated pressure, close it.Dual table and high pressure side and low pressure side.

Turn off the recovery unit "OFF"

(1)Turn off the inlet valve of recovery unit.

3、 Freon(CFC) emissions, cleaning, operation

•Be sure to clean the machine after recovery is completed, the remaining CFC may damage the recovery unit.

(Figure 7)



•Valve operation(See figure 7)

①Close the inlet valve of recovery unit.

②Adjust the turn and off switch to cleaning.

•Operation

③Recycling power switch is turned "ON"

④Press the start button "ON"

 $\textcircled{5}\ensuremath{\mathsf{When}}$ the gauge reaches the suction vacuum, close the input valve

6 Close outlet valve

•Complete

⑦Close the recovery unit "OFF"

(8) Adjust the turn and off valve to recovery.

Disconnect the hose

(1) The cap set in the safety circuit container joints

VII, Push-pull recovery method

•This method is recommended to use a large number of CFC recovery system (more than 5kg).It can shorten the time of recycling the CFC liquid directly, and in a gaseous form of recycling residual CFC (Freon).

1. The following systems do not apply this method:

a; Less than 5kg refrigerant refrigerator or air conditioning system.

b; Using a heat pump or valve system.

c; Use pressure accumulator system.

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d: If you are unsure, contact a refrigerator or air conditioner manufacturer, because it takes the system and conditions

2. Connecting hose and power (See Figure 8)

When using a container with a float sensor When using an ordinary container

(Figure 8)



- a: Hose connection in accordance with the above, Using the container without float sensor, configure the limit gauge to prevent recovery of excess
- b: Connect safety line with container or vessel limited gauge, only the safety line was connected then start the recovery unit.

Refrigerant Recovery Unit 3, Recovery unit and exhaust hose (Figure 9) Prwer Switch Start Switch (5) Open 4) Open Input Valve Close Switch Valve Outlet Valve 7Connec (1) Open (2) Recovery (1) Open Liquid Valve Gas Valve Close Hold Tightly Liquid Enc End Clos Open " Slouly lose 🚮 High Pressur End Clos 9 Open With Floating System Containers

●Valve operation(See Figure 9)

 $\textcircled{\sc opt}$ Open the input and output valve of recovery unit.

②Adjust turn and off valve to recover.

(a)Disconnect the system from the low pressure side of the hose, hose locking catch.

Operation

④ Open power switch "ON".

⑤Press the start button"ON".

(6)When the pressure reaches vacuum, turn off the inlet valve.

⑦Adjust turn and off valve to cleaning.

(8) When the pressure reaches vacuum again, connect the disconnected hose to low pressure side.

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Complete

Olose recovery unit "OFF"

(19) Open the high pressure side in system.

(1) Then slowly release the liquid end of the container hose.

(1)After the exhaust is completed, immediately close the hose connection.

4. Recovery Operation



Valve operation (See Figure 10)
①Open the inlet and outlet valve of recovery unit.
②Open the valve to adjust to cleaning.

•Operation

③Open the high and low pressure end of the system.④Open the liquid value of container.

5 Open the power switch" ON".

⁽⁶⁾Press start button"ON".

⑦Slowly open the gas valve.

•Complete Push-pull recovery method.

(8)When liquid recover was completed, turn "OFF",check sight window, how much liquid remaining.(9)Close all valves.

(II) Replace the connection hose for gas recovery, according to the program of "normal recovery process," because the system still remains gaseous CFC (Freon).

VIII,R410A and the recovery method of high pressure of CFC

1、 When recover R410A and high pressure CFC(because of high temperature), according to the process as follow:

a; Basic operation please according to " normal recovery method"

- b; When the temperature rise in abnormal inside the container, there may have not be condensed substance in the container, in this case, exclude or replace the air inside the container
- c: When recover high pressure Freon under high temperatures, it should adjust the suction pressure to recover, tighten the valve dual table until the disappearance of abnormal Sonorant. (Figure 12)

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Figure11



2. Cooling container, CFC container can (cryogenic cooling) in accordance with the following cooling



①According to the above connecting hose to recover.
②When the temperature rises in container or pressure rises, close recovery unit "OFF".

③Close the high and low pressure ends of double table.

④Open gas container valve.

⑤Open power switch "ON".

⁽⁶⁾Press the start button"ON".

When the pressure vessel is reduced, closed the gas valve.
Open high pressure and low pressure vale of double table, and continue recover operation.

3、Using a cooling device (optional)

- You can use a cooling device (CFC cooling equipment) to reduce the temperature of the high pressure CFC to continue the recovery operation
- •By cooling the CFC, can improve the recovery rate of 20%. For more information, refer to the instructions supplied cooling device.

4. How to replace CFC Freon. (See Figure 13)



a; When recovering a different Freon, according to the following

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procedure

- 1 With a leather tube outlet valve and vacuum pump header
- 2 Close inlet valve.
- ③ Close outlet valve.
- (4) Start Vacuum Pump "ON".

(5)10 minutes later, close vacuum pumo "OFF".

(6) If required, clean or replace the filter input port.

Refrigerant Recovery Unit IVV,Troubleshooting Guide

Trouble		Reason	Measure
	When the power is turned on the fan does not turn	Power cord is not plugged in Circuit Protection starts work	Connect the power cord, check the power plug Click the Reset switch
	Fan turn, but then switch to "ON" position, the compressor is not running	Automatic power-off state at high pressure Controls the high voltage switch is damaged Motor or other electronic components is broken	Reduce pressure, and then press the high voltage switch button Rotation of the input valve to the "off" position, the valve is self-cleaning to "self-cleaning" position, then enter the rotary valve back to the "open" position, the valve is self-cleaning to "recycle" position Requiring manufacturers to service
	Compressor starts, cut off in a moment.	Self-cleaning valve "self-cleaning" position Outlet valve did not open, high pressure to stimulate the recovery container valve	Rotating self-cleaning threshold "recycle" position Rotary output threshold "open" position Open the valve recycling
	Recycling process is too slow	Top pressure is too high Compressor wear sealed box	Reduce the use of storage container vessel temperature cooling method
Can not reach vacuum.		Loose connection pipe Parts loopholes	Tighten the connecting pipe Requiring manufacturers to provide services

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6, Stop when unit is running.

a; Motor thermal protection is activated

1 When the motor is too hot to run

② Place 10 to 20 minutes, when the motor cooling will be automatically restored

b; High Pressure

①Close the power switch.

②Eliminating the cause of high pressure, (if the pressure vessel exceeds 2.75Mpa, the container needs to be cooled, for example, ice).

③Close inlet valve, re-set recovery unit.

c; Breaker installed on the power switch is activated ①Close recovery unit "OFF".

2 Wait a moment, and turn on the power switch to "ON"