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Empowering you to work smarter

Recovery Unit
User Manual
NRDC4M



Failure to follow warnings could result in death or serious injury.

SAVE THIS MANUAL FOR FUTURE REFERENCE

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MASTER SERIES

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GENERAL SAFETY

Use information

- In order to prolong the life cycle of the recovery unit, please read the manual carefully before using to fully understand the safety, specification as well as operating procedure of the recovery unit.
- Please check the product received is same as you ordered.
  Please check the product if there is any damage during transportation.
  Contact with local distributor if the above problem is found.
- Please read the manual carefully and use the unit according to the product operating procedures.

Safety indication

⚠ Warning

This mark indicates procedures that must be strictly observed to prevent hazards to people.

⚠ Notice

This mark indicates procedures must be strictly observed to prevent damage or destruction of the unit.

Matters needing attention

⚠ Warning

Only a qualified technician should operate this recovery unit.

Before starting the equipment, make sure that it is well grounded.

If using electrical extension cord, the cord must be in good condition and properly connected and grounded.

The power must be cut off and no display in LCD before inspecting or repairing.

If the original power supply cord is damaged, an OEM replacement may be ordered through your NAVAC distributor.

Only a qualified person may replace the cord according to local codes and standards using OEM wiring diagram

GENERAL SAFETY

Only authorized refillable refrigerant tanks can be used. It requires the use of recovery tanks with a minimum working pressure of 652.6 psi (45 bar). Do not overfill the recovery tank, maximum at 80% capacity to make sure that there is enough space for liquid expansion. Overfilling of the tank may cause a violent explosion.

Always wear safety goggles and protective gloves while working with refrigerants to protect your skin and eye from hurting by refrigerant gases or liquid.

Do not use this equipment near flammable liquid or gasoline.

An digital scale is needed to prevent overfillinf.

Be sure that the place where you are working is thoroughly ventilated.

⚠ Notice

The middle fan runs when power is connected. All three fans run when the motor is on.

Be sure the unit is working under the right power supply.

When using an extension cord it should be minimum 14 AWG and no longer than 25 feet, otherwise it may cause the voltage drop.

The input pressure of the unit should not exceed 377 psi (26 bar).

The unit need to be laid in horizontally, otherwise it will lead to unexpected vibration, noise or even abrasion.

Do not expose the equipment to sun or rain.

The ventilation opening of the unit must not be blocked.

If the overload protector pops, reposition it after 5 minutes.

When doing self purging operation, the knob must be turned slowly to “PURGE” to ensure the inlet pressure is less than 72.5 psi (5 bar).

If fluid hammer happens in the recovery, please turn the knob slowly to “SLOW” position and do not let reading pressure drop to zero.

When you select fast model to start work,please monitor output pressure, if the output pressure increase fast to 391.6 psi (27bar),please turn to slow mode slowly and monitor the outlet pressure not exceeding 507.6 psi(35bar).

The equipment is intended for serving air-conditionting and refrigeration systems containning more than 200 lbs of high-pressure refrigerant.

The tank and hose used must comply with the local regulations.

OPERATION

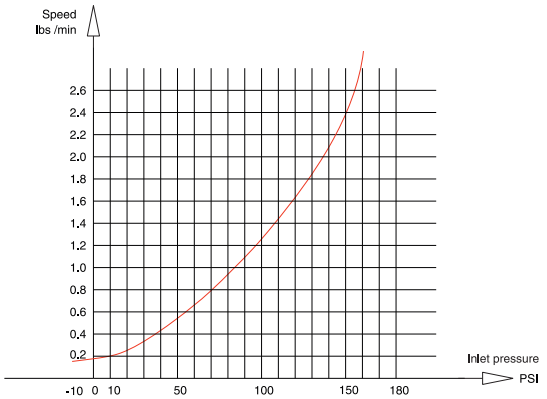
1. Do not mix different refrigerants together in one tank, otherwise they could not be separated or used.
2. Before recovering the refrigerant, the tank should achieve the vacuum level: -29.6 inHg, for purge non-condensable gases. Each tank was full of nitrogen when it was manufactured in the factory, thus the nitrogen should be evacuated before first use.
3. The knob should be in the "Close" Position before operation. All the valves must be closed, the input and output fittings should be covered with protective caps when the unit is not in operation. The air/moisture is harmful to the recovery result and will shorten the life span of the unit.
4. A filter drier should always be used and should be replaced regularty. And each type of refrigerant must have its own filter. For the sake of ensuring the normal operation of the unit, please use high quality filter drier specified by our company. A high quality filter drier will help protect machine.
5. Special-caution is needed when recovering from system, and two dry filters are needed.
6. The unit has an Internal High Pressure protector. If the pressure inside the system is above rated shut-off pressure（see specification）, compressor will automatically shut off and the HP cutoff shows. To restart the compressor, please lower the internal pressure (Output gauge indicates lower than 435 psi (30 bar), after the HP cutoff blinks, then Press the “START” button to restart the compressor. When high pressure protection initiates, please determine the cause and deal with it before restarting the unit.
   ① The input valve of the refrigerant tank is closed—opening the valve will help solve the problem.
   ② The connecting hose between the recovery unit and refrigerant tank is plugged ——close all the valves and replace the connecting hose.
   ③ The temperature of the refrigerant tank is too high, causing high pressure— cool the tank down.

SPECIFICATION

	NRDC4M
Refrigerant Type	Category III: R-12, R-134a, R-401C, R-500 Category IV: R-22, R-401A, R-401B, R-402B, R-407C, R-407D, R-408A, R-409A, R-502, R-509 Category V: R-402A, R-404A, R-407A, R-407B, R-410A, R-507
Power Supply	115V / 60Hz
Motor	1.5HP
Max Current Draw	12A
Compressor	Oil-less, Air-cooled, Piston style
Automatic Safety Shut-Off	558 psi (38.5 bar)
Inlet/Outlet Port	Inlet 3/8", Outlet 1/4"
Dimension	17" × 10.7" × 12.2"
Weight	41.9lbs

NRDC4M

Recovery Rate	R-22	R-134a	R-410A
High Temp Vapor (lbs/min)	N/A	N/A	1.02
Direct Vapor (lbs/min)	0.93	0.34	1.02
Direct Liquid (lbs/min)	7.16	4.95	9.20
Push/pull Liquid (lbs/min)	13.29	10.20	18.41

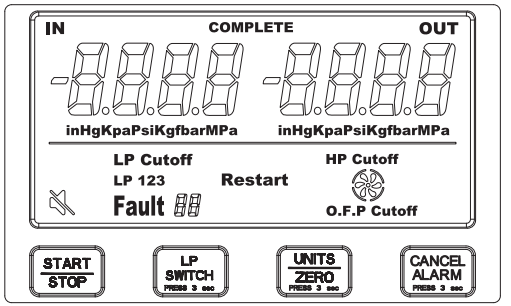


⚠ Notice

The vapor flow rate is proportioned to inlet pressure.

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INTRODUCTION OF OPERATION PANEL

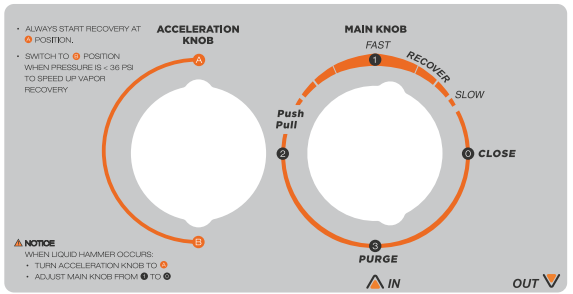


Start/Stop	Starts and Stops recovery unit
LP Switch	Hold for 3 seconds to switch between LP1,LP2,LP3
Units/Zero	Press to change units to InHg, Kpa, Psi, Kg/f, Bar, Mpa. Hold for 3 seconds to zero out readings
Cancel Alarm	Hold for 3 seconds to mute recovery unit

LP1: (Auto shutoff with manual restart)	If the inlet pressure is lower than -20inHg for 20 seconds, the unit will shut down. "LP Cutoff" will be displayed. When Lp≥0 inHg you must press START to restart the recovery unit.
LP2: (Auto shutoff with autmatic restart)	If the inlet pressure is lower than -20inHg for 20 seconds, the unit will shut down. "LP Cutoff" is displayed. When LP≥0 inHg the unit will restart automatically
LP3: (Continuous Run)	The recovery unit will run continuously, no matter what the level the input pressure is(LP)

HP Cutoff	Will light up when high pressure switch is activated above 560 psi.
O.F.P Cutoff	Will light up when the recovery cylinder is 80% filled. The machine will stop running.

INTRODUCTION OF OPERATION PANEL



Acceleration Knob	A for initial recovery down to 36 psi inlet pressure B for fastest vapor recovery
Close	Inlet valve is closed
Recover	Input valve is partially opened
Fast	Input valve is fully opened
Purge	Input closed, and output is opened to allow the unit to remove most of the refrigerant inside the recovery machine

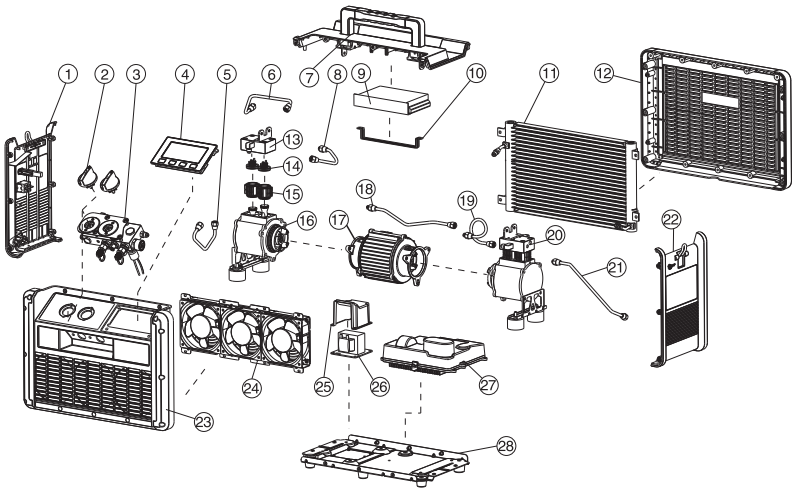
Error Codes

- E1: The pressure sensor is disconnected
- Fault 2: Input voltage is too low
- Fault 3: High input voltage
- Fault 4: Overcurrent protection
- Fault 5: Temperature sensor open
- Fault 6: Temperature sensor short circuit
- Fault 7: Temperature protector open
- Fault 8: Motor stalling
- Fault 9: Motor wire short circuit
- Fault 10: Motor wire short circuit
- Fault 11: PFC over electric current
- Fault 12: Motor temperature protection

Mute	Audible alerts and beeps are turned off
Fan	This icon rotates while the machine is running. When the machine stops, the icon stops rotating.
Restart	It will flash after an error has occurred and settled. Pressing START will resume activity

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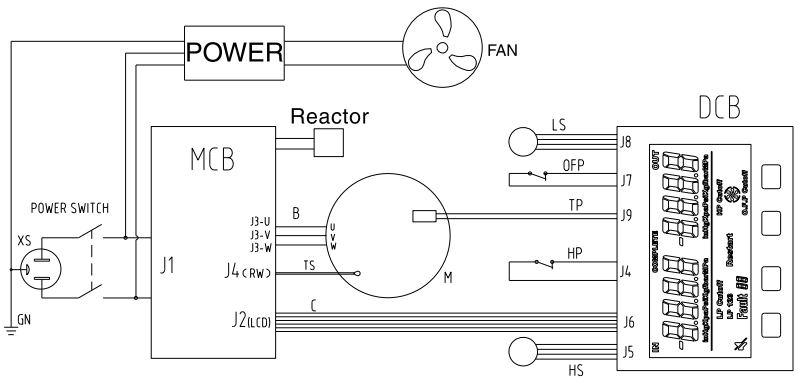
PARTS DIAGRAM



1	Left Side Plate
2	Knob
3	Control Panel
4	Digital Control Board
5	Inlet Tube
6	Condenser Inlet Tube
7	Top Plate
8	Outlet Tube
9	Power Supply for Fan
10	Cover Board
11	Condenser
12	Rear Side Plate
13	Cylinder Cover
14	Valve

15	Cylinder
16	Compressor
17	Motor
18	Inlet Tube
19	Outlet Tube
20	Cylinder Cover
21	Condenser Outlet Tube
22	Right Side Plate
23	Front Plate
24	Fans
25	Cover Board
26	Electric Reactor
27	Motor Control
28	Base

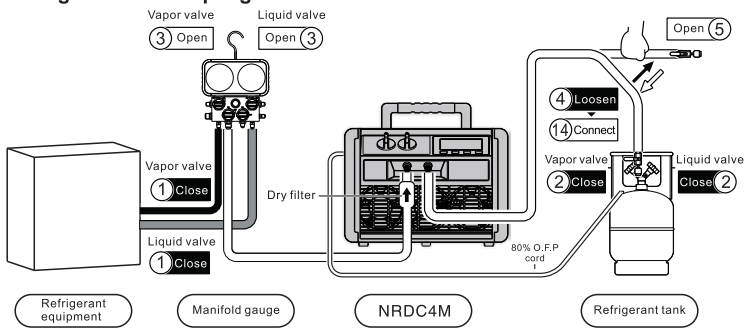
WIRING DIAGRAM

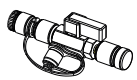


POWER	Power for Fan
MCB	Motor Control Board
DCB	Digital Control Board
XS	Power Socket
GN	Ground Wire
M	Motor
B	Motor Phase Wire
TS	Motor Temperature Sensor
C	Connection Wire
LS	Low Pressure Sensor
HS	High Pressure Sensor
OFP	Over Filling Prevention
TP	Temperature Protector
HP	High Pressure Protector

OPERATING INSTRUCTION

1). Refrigerant hoses purge





Use NVR1 valve core removal for faster recovery speed.

Ready for operation

Connect the hoses correctly and firmly.
(Please refer to the connection diagram)

1. Confirm the vapor valve and liquid valve of AC system are in close position.
2. Confirm the vapor valve and liquid valve of recovery tank are in close position.
3. Open the vapor and liquid valves of manifold gauge.
4. Loosen the connecting pipes of refrigerant tank.
5. Open the check valve of pipes.

Start operation

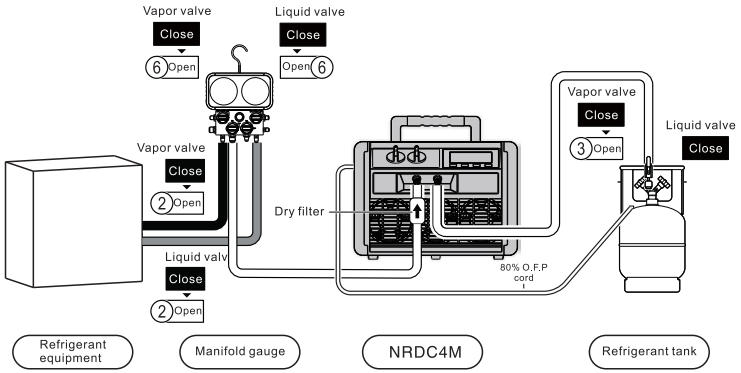
6. Plug in the machine, turn on the power, and the LCD shows pressures.
7. Press the“START”button to start machine.
8. Turn the knob to recover.
9. Observe the reading of the low pressure gauge when it reaches to-20inHg, after 20 seconds,LP cutoff opens and the machine shuts off.
10. Turn the knob to “Close”, LP cutoff blinks, press the power button and start machine.
11. Turn the knob slowly to “Purge” and start self purging.
12. Observe the reading of the low pressure gauge when it reaches to -20inHg for the second time, after 20 seconds,LP cutoff turns on and the machine stops work .

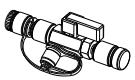
Finish operation

13. Turn the knob to “Close” and stop self purging.
14. Disconnect the refrigerant hose to the tank.

OPERATING INSTRUCTION

2). Recovery mode





Use NVR1 valve core removal for faster recovery speed.

Ready for operation

Connect the hoses correctly and firmly.

(Please refer to the connection diagram)

Make sure all valves are closed.

1.Switch off the power of refrigerant equipment.

2.Open the vapor and liquid valves of refrigerant equipment.

3.Open the vapor valve of the refrigerant tank.

Start operation

4.Press the “START” button to start machine.

5.Turn the knob to “Recover”.

6.a. If recover liquid refrigerant, please open the liquid valve of the manifold gauge.

b. If recover vapor refrigerant, please open the vapor valve of the manifold gauge.

7.Switch to “B” position when pressure is < 36 psi to speed up Vapor recovery.

8.The recovery mode will be finished when machine runs to certain vacuum level or automatic close of low pressure protection.

Do not turn off the power after recovery finished and directly run self purging mode.

⚠ Notice

①When liquid hammer occurs,turn Acceleration Knob to “A”, and adjust main knob From “1” to “0”.

②If it is difficult to start, turn to " CLOSE " when liquid, turn to " PURGE " when vapor, then press " START " to restart the machine , and turn to the required position.

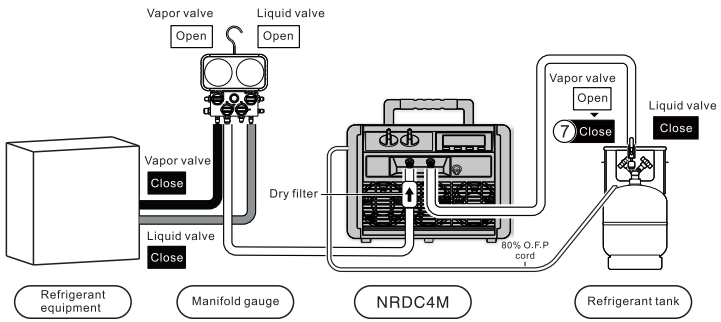
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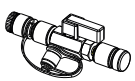
OPERATING INSTRUCTION

3). Purge mode

⚠ Notice

The unit must be purged after each use;Liquid refrigerant remained may expand and damage the components and pollute the environment.





Use NVR1 valve core removal for faster recovery speed.

Start operation

1.The machine stops automatically after recovery finished based on LP cutoff setting.

2.Turn the knob to “Close” and the LP cutoff blinks, press “ START ” button to start the machine.

3.Turn the knob to “Purge” and start self purging.

4.The self purging mode will be finished when machine runs to certain vacuum level.

Finish operation

5. Turn the knob to “Close”.

6. Turn off the power switch. Disconnect power cord.

7. Close the check valve which connected to exhaust.

8. Close the vapor valve of the tank.

9. Disconnect all hoses.

NOTE:

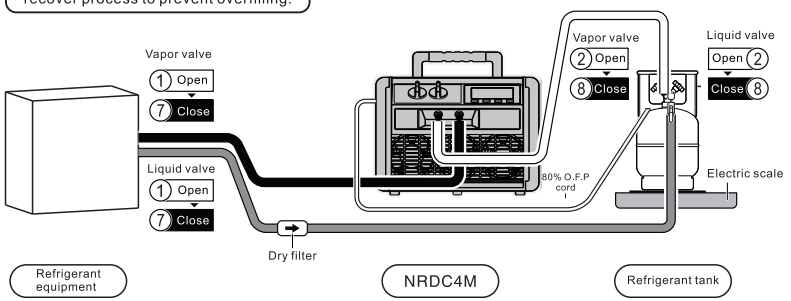
For maximum performance do not use a manifold for recovery. Use 3/8" or 1/2" diameter hoses and a full flow tee fitting between system connections and machine inlet. Use NRV1(s) to remove cores and control refrigerant flow from system.

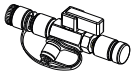
OPERATING INSTRUCTION

4). Liquid push/pull mode

⚠ Notice

A digital scale is needed to monitor the recover process to prevent overfilling.





Use NVR1 valve core removal for faster recovery speed.

Ready for operation

Connect the hoses correctly and firmly.

(Please refer to the connection diagram)

Make sure all valves are closed.

Start operation

1.Open the vapor valve, liquid valve of the HVAC system.

2.Open the vapor valve, liquid valve of the tank.

3.Press "START" button to start machine, then it starts liquid push/pull mode.

4.Turn the knob to "Recover".

If the reading on the scale keeps the same or changes slowly, it means liquid in HVAC system has been recovered and vapor recovery mode can be underway.

5.Turn the knob slowly to "Purge" and start self purging mode for the liquid.

6.Turn the knob to "Close".

7.Close the vapor valve, liquid valve of the HVAC system.

8. Close the vapor valve, liquid valve of the tank.

9.Reconnect the hoses and start recovery mode for the vapor.

Finish operation

TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
LCD does not work after power is on	1. Power cord is damaged. 2. Inner connection is loose. 3. Connect to J6 is damaged. 4. Malfunction of circuit board.	1. Replace cord. 2. Check the connection. 3. Replace the connect. 4. Replace MCB or DCN circuit board. Contact NAVAC techsupport.
Machine does not run after pressing START	1. HP Cutoff, or OFP Cutoff works (screen shows) 2. Fault 2 or Fault 3 3. Fault 4 or Fault 8, over load 4. Fault 5 5. Fault 6 6. Fault 7 or Fault 12 7. Fault 9 or Fault 10 8. Fault 11 9. Button is damaged 10. Circuit board is damaged	1. Check if the connection between HP or OFP to DCB is good. 2. Adjust to correct voltage. 3. Turn knob to close. Press START. 4. Check if the connection between TS and MCB is good. If good, contact NAVAC techsupport. 5. Check if TS connection is damaged. If not, contact NAVAC techsupport. 6. Check if the connection between TP and MCB is good. If good. 7. Replace digital control board. 8. Replace circuit board. 9. Cool down the machine. 10. Check if connection wire between motor and MCB is good.If good, contact NAVAC techsupport.
Machine stops after running a period of time	1. Misoperation causes HP Cutoff. 2. Thermal protector is on and shows Fault 7. 3. Refrigerant is 80% in the tank, and O.F.P Cutoff shows. 4. Recovery work is finished. LP Cutoff shows.	1. Refer to section 6 of OPERATION on page 3. 2. When Fault 7 and Restart flash, press START. 3. Replace the tank. When O.F.P Cutoff and Restart flash, press START. 4. Could restart with pressure rise.
E1 shows at LP or HP	Pressure sensor is not connected well or is short circuit.	Check if the connection between LS or HS to DCB is good. If good, replace pressure sensor.
Slow recovery rate	1. The pressure of the refrigerant tank is too high. 2. Piston ring of compressor is damaged.	1. Cooling the tank help decrease the pressure. 2. Contact NAVAC techsupport.
Not evacuate	1. Connection hose is loose. 2. Machine leaks.	1. Tighten the connection hoses. 2. Contact NAVAC techsupport.