

**VALUE**<sup>®</sup>

# REFRIGERANT RECOVERY UNIT

## VRR24A/VRR24C OPERATING MANUAL



**VALUE**<sup>®</sup>

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**Note: We reserve the right of modifying the design, specifications without notice, due to product improvements.**

# 1 GENERAL SAFETY AND OPERATION GUIDELINES

## ▲ Warning

Read all safety, operating guidelines and instructions before operating this unit.

1. Only a qualified technician should operate this recovery unit!
2. Always wear safety goggles and protective gloves while working with refrigerants to protect your skin and eyes from refrigerant gases and refrigerant liquid. Avoid getting in touch with caustic liquid or gas.
3. Do not expose the equipment in the sun or rain.
4. Be sure that any room where you are working is thoroughly ventilated.
5. Use ONLY authorized refillable refrigerant tanks. It requires the use of recovery tanks with a minimum working pressure of 27.6 bar.
6. Do not overfill the recovery tank. Tank is full at 80% capacity. There should be enough space for liquid expansion. Overfilling of the tank may cause a violent explosion.
7. Do not exceed the working pressure of Recovery Tank Cylinder.
8. Do not mix different refrigerants together in one tank, or they could not be separated or used.
9. Before recovering the refrigerant, the tank should achieve the vacuum level: -0.1 mpa, which is for purging non-condensable gases. Each tank was full of nitrogen when it was manufactured in the factory, thus the nitrogen should be evacuated before the first use.
10. When the unit is not used, all the valves should be closed and the input and output fittings should be covered with the protective caps. Without protective caps, because the air or the moisture of the air may harm the recovery result and shorten the service life of compressor.
11. While using an extension cord it should be a minimum 14 AWG and no longer than 7.6 meters, or it may make the voltage drop and damage the compressor.
12. A filter drier must always be used and should be replaced frequently. And each type of refrigerant must have its own filter. For the sake of ensuring the normal operation of the unit, please use the filter specified by our company. High quality filter drier will bring high quality services.
13. Special care should be taken while 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 foreign substances left inside.
14. The unit has an Internal High Pressure Shut Off Switch. If the pressure inside the system should go above 38.5 bar, the unit will automatically shut itself off and the Red Alarm Light turns on (item 7 on the parts diagram). If it needs to restart the compressor, please find out the cause first, then reduce the

# 1 GENERAL SAFETY AND OPERATION GUIDELINES

internal pressure below 25 bar. Press the start button (item 8 on the parts diagram) to restart the compressor.

- Solution for possible cause of High Pressure Shut Off:

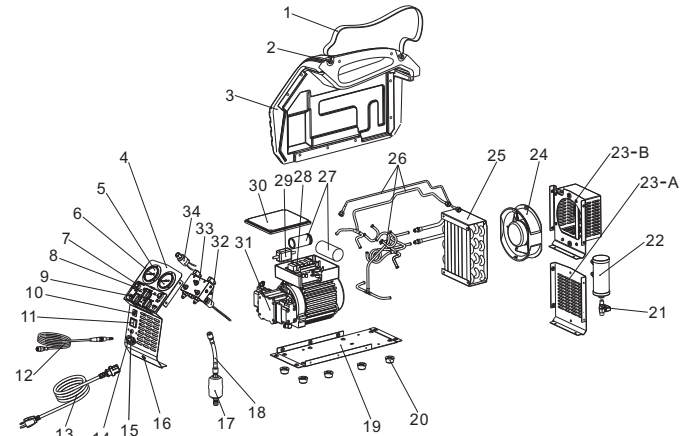
- 1) Open the output valve of the unit if it's closed.
  - 2) Open the input valve of the recovery tank if it's closed.
  - 3) To check if the hose connected between the unit and the recovery tank is jammed. If yes, please close the output valve of the unit and the input valve of the recovery tank and then change a new one.
15. The unit has an Internal Low Pressure Shut Off Switch. To start the unit before operation, it should open first both the HVAC valve and the input valve of the unit to keep the input pressure above 3~9 psi, then switch on the unit and press the start button to start the compressor. If the pressure inside the system should go below -5~14 inHg, the unit will automatically shut itself off and the Green Alarm Light turns on (item 7 on the parts diagram). To restart the compressor, please increase the input pressure above 3~9 inHg and then press the start button.
  16. The unit is designed both for recovery tank without or with float level sensor. In the last case, before starting the compressor, the Float Cable (item 12 on the parts diagram) must be connected with the unit (item 15 on the parts diagram) and the recovery tank. While in operation, if the level reaches 80% capacity of the tank, the unit will automatically stop running and the 80% O.F.P. Alarm Light turns on. Please change to an empty tank and then press the start button to restart the compressor.
  17. If the tank pressure exceeds 20.7 bar, use the Recovery Tank Cooling Method to reduce the tank pressure.
  18. To maximize recovery rates, use the shortest possible length of 3/8" or larger hose. A hose no longer than 0.9 meter is recommended.
  19. While recovering large amounts of liquid, use the liquid Push/Pull method.
  20. 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.
  21. 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.

**Note: For VRR24C, the unit has an oil separator device. While in operation, please turn small the input valve to keep the pressure of the input gauge near 4 kg/cm<sup>2</sup> to get the best oil separation result. After recovery of every 8 kg of refrigerants, please self-purge first, then switch off the unit, and at last open the oil drain fitting to drain the separated oil.**

## 2 SPECIFICATIONS

<b>Refrigerants</b>	Category III: R12, R134a, R401C, R406A, R500			
	Category IV: R22, R401A, R401B, R402B, R407C, R407D, R408A, R409A, R411A, R411B, R412A, R502, R509			
Category V: R402A, R404A, R407A, R407B, R410A, R507				
<b>Power</b>	230V/50~60Hz	100V/50~60Hz	115V/60Hz	
<b>Motor</b>	1 HP			
<b>Motor speed</b>	1450 rpm@50Hz	1750 rpm@60Hz		
<b>Maximal current draw</b>	5 A	10 A		
<b>Compressor</b>	Oil-less, air-cooled, piston			
<b>Automatic safety shut-off</b>	38.5 bar/558 psi			
<b>Automatic shut-off at vacuum</b>	5~14 inHg			
<b>Recovery rate (kg/min)</b>		Category III	Category IV	Category V
	Vapor	0.46	0.50	0.52
	Liquid	3.14	3.62	3.70
	Push/pull	7.47	8.37	9.95
<b>Operating temperature</b>	0 ~ 40°C/32 ~ 104°F			
<b>Dimensions</b>	VRR24A	515 mm×245 mm×360 mm		
	VRR24C	545 mm×245 mm×360 mm		
<b>Weight</b>	VRR24A	17 kg		
	VRR24C	18 kg		

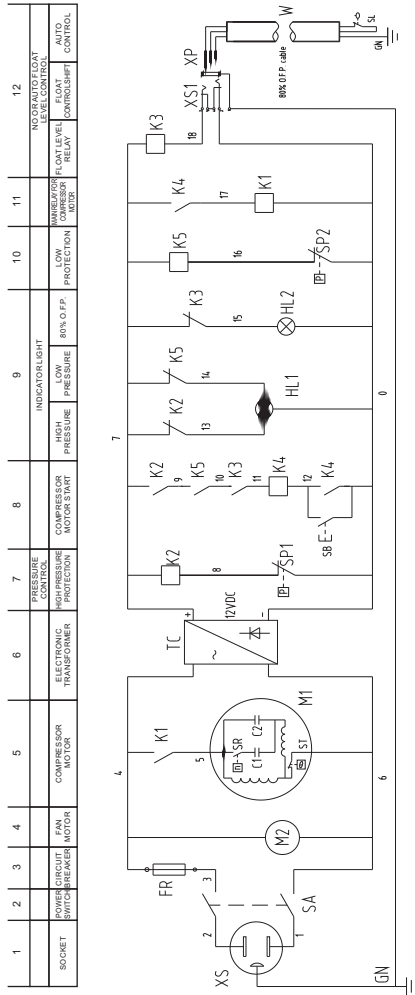
## 3 PARTS DIAGRAM AND PARTS LIST



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	BELT	18	HOSE 4"
2	PIN	19	BASE
3	PLASTIC CASE	20	RUBBER FOOT
4	FRONT PANEL	21	OIL DRAIN VALVE
5	INPUT GAUGE	22	OIL SEPARATOR
6	OUTPUT GAUGE	23-A	BACK PANNEL (VRR24A)
7	HIGH PRESSURE ALARM LIGHT	23-B	BACK PANNEL (VRR24C)
8	START BUTTON/80% O.F.P.ALARM LIGHT	24	AXIAL FAN
9	KNOB	25	CONDENSER
10	CIRCUIT BREAKER	26	COPPER HOSE
11	POWER SWITCH	27	CAPACITOR
12	FLOAT CABLE	28	CIRCUIT PLATE
13	POWER SUPPLY CORD	29	ELECTRONIC TRANSFORMER
14	POWER SOCKET	30	CAPACITOR COVER
15	FLOAT CABLE SOCKET	31	COMPRESSOR
16	RUBBER STOPPER	32	HIGH PRESSURE SWITCH
17	FILTER	33	CONTROL VALVE
		34	LOW PRESSURE SWITCH

\* Item 21&22 is only for VRR24C

# 4 WIRING DIAGRAM



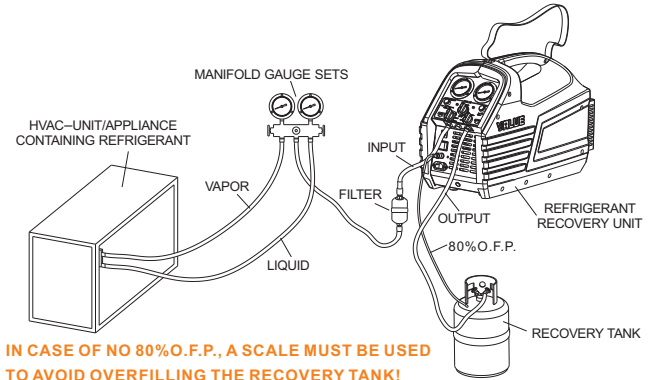
CODE	DESCRIPTION
SB1	START BUTTON / INDICATOR LIGHT
HL2	80% O. F. P. INDICATOR LIGHT
HL1	HIGH AND LOW PRESSURE PROTECTION INDICATOR LIGHT
XS1	FLOAT CABLE SOCKET
XP	PLUG 6.35
W	FLOAT CABLE
ST	THERMAL PROTECTOR

CODE	DESCRIPTION
SR	CENTRIFUGAL SWITCH
C1	START CAPACITOR
C2	RUNNING CAPACITOR
TC	ELECTRONIC TRANSFORMER
SP1	HIGH PRESSURE SWITCH
SP2	LOW PRESSURE SWITCH
SL	80% O. F. P. SWITCH

CODE	DESCRIPTION
XS	POWER SOCKET
SA	POWER SWITCH
FR	CIRCUIT BREAKER
M1	COMPRESSOR MOTOR
M2	AXIAL FAN
K1	RELAY
K2-K5	RELAY

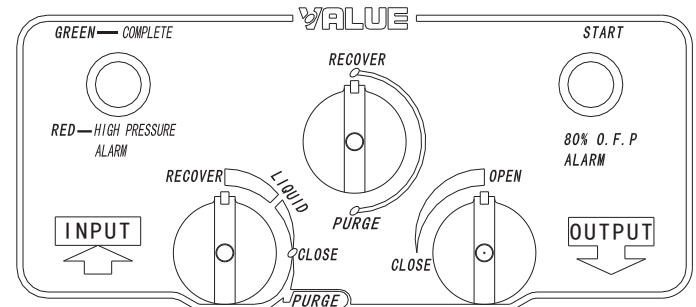
# 5 STANDARD LIQUID/VAPOR RECOVERY METHOD

1. Make sure the unit is in good operating condition.
2. Make sure all connections are correct and tight (refer to following illustration):



**▲ IN CASE OF NO 80%O.F.P., A SCALE MUST BE USED TO AVOID OVERFILLING THE RECOVERY TANK!**

3. Open the liquid port of the recovery tank.
4. Make sure the Recover/Purge valve is set on Recover.
5. Open the output port of the unit.
6. Slowly open the input valve.
7. Open the liquid port on your manifold gauge sets. (Opening the liquid port will remove the liquid from the system first. After the liquid has been removed, open the manifold vapor port to continue evacuating the system).



## 5 STANDARD LIQUID/VAPOR RECOVERY METHOD

8. Connect the unit to a right outlet. (See the nameplate on the unit) Switch the power switch to the "ON" position, then press the start button (item 8 on the parts diagram) to start the compressor.

### CAUTION

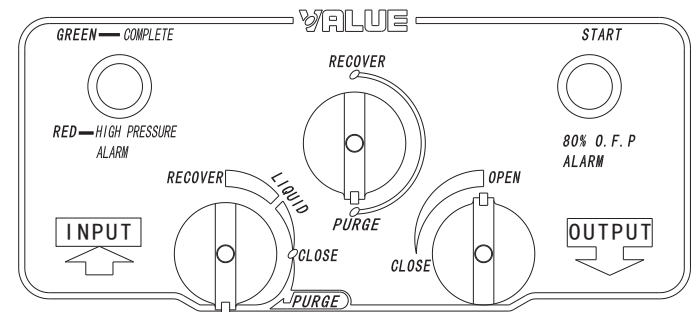
- 1) If the unit fails to start, switch the power switch to the "OFF" position, turn the input valve to the "Purge" position, and then start the compressor.
  - 2) If the compressor starts to knock, slowly throttle back the input valve until the knocking stops.
  - 3) If the input valve was throttled back, it should be fully opened once the liquid has been removed from the system (the vapor port of the manifold gauge sets should also be opened at this time).
9. Run until desired vacuum is achieved or the unit is under low pressure protection and shuts off automatically.
- 1) Close the vapor and liquid ports of the manifold gauge sets.
  - 2) Close the HVAC ports connected with the manifold gauge sets.
  - 3) Turn off the unit.
  - 4) Close the unit's input port and proceed with the Self-Purge Method on the next page.

**CAUTION:** Always purge the unit after each use. Failure to purge the remained refrigerant from the unit could result in the acidic degradation of internal components and ultimately cause premature failure of the unit.

## 6 SELF-PURGE METHOD

### Procedure for purging remained refrigerant from this unit

1. Turn the input valve to the "CLOSE" position (output valve and recovery tank valve are open).
2. Turn the Recover/Purge valve to the "Purge position".
3. Switch the power switch to the "ON" position, then press the start button (item 8 on the diagram) to start the compressor until desired vacuum is achieved or the unit shuts off automatically.
4. Close the valves on the recovery tank and the unit.
5. Turn the unit off.
6. Return the Recover/Purge valve to the "Recover" position and the input and output valve to the "CLOSE" position.
7. Disconnect and store all hoses and filter drier.
8. Screw the protective caps on the input and output fittings.

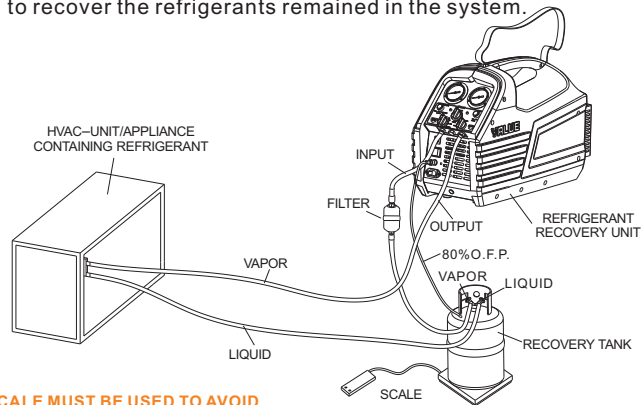


## 7 LIQUID PUSH/PULL METHOD

Push/Pull method only works with large systems where the liquid refrigerant is no less than 10 kg.

**CAUTION:** While using the “push/pull” method, a scale must be used to avoid over filling the recovery tank. Once the siphon is started, it can overflow the recovery tank even if the tank is equipped with a float level sensor. The siphon can continue even if the machine was turned off. You must manually close the valves on the tank and the unit to prevent overflowing of the recovery tank.

1. Make sure all connections are correct and tight (refer to following illustration).
2. Put Recover/Purge valve on Recover.
3. Open Output valve.
4. Open Input valve.
5. Start the compressor until the recovery is over.
6. When the scale rises to 80% capacity of the recovery tank, close right away first all input valves, then all output valves.
7. Switch off the unit.
8. Change the recovery tank by a new one.
9. Proceed with previous steps of the Liquid Push/Pull Method until the scale stop rising.
10. Close first all input valves and then all output valves.
11. Switch off the unit and disconnect all connections.
12. Proceed with Standard Liquid Vapor Recovery Method and Self-Purge Method to recover the refrigerants remained in the system.

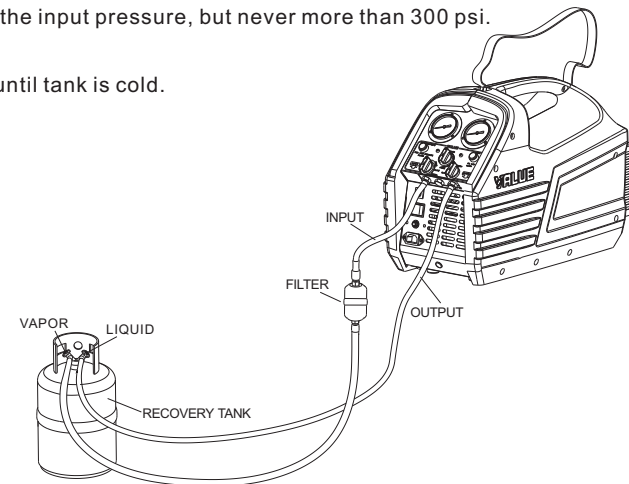


**⚠ A SCALE MUST BE USED TO AVOID OVERFILLING THE RECOVERY TANK!**

## 8 RECOVERY TANK COOLING METHOD

### Pre-work Cooling Procedure

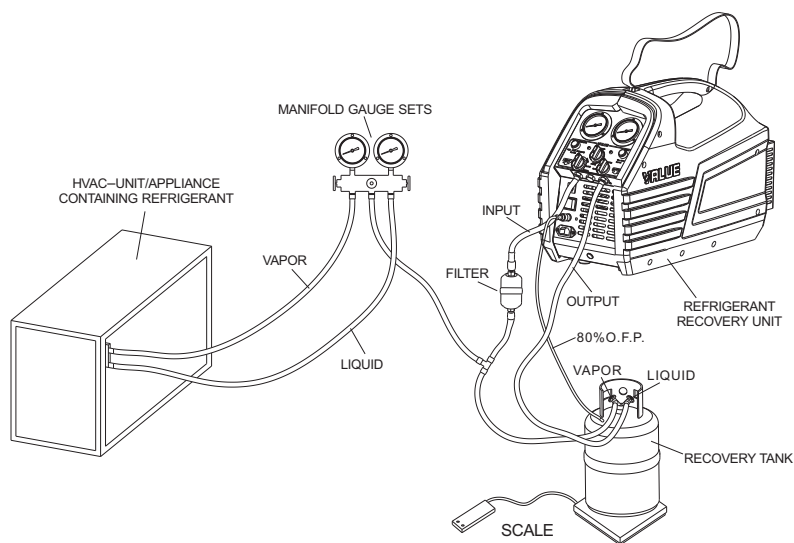
1. To start you must have a minimum of 0.5 kg of liquid refrigerant in the tank.
2. Turn the Recover/Purge valve to the "Recover" position.
3. Open the Vapor and Liquid valve of the recovery tank.
4. Power on, and then press the start button (item 8 on the parts diagram) to start the compressor.
5. Open the input valve and output valve of the unit.
6. Throttle the output valve of the unit so that the output pressure is 100 psi greater than the input pressure, but never more than 300 psi.
7. Run until tank is cold.



## 8 RECOVERY TANK COOLING METHOD

### Tank Cooling Procedure in the recovering process

1. Open the vapor valve of the recovery tank (it is closed while recovering).
2. Close the two valves of the manifold gauge sets.
3. Follow the sixth and seventh steps of the Pre-work Cooling Procedure.



**⚠ IN CASE OF NO 80% O.F.P., A SCALE MUST BE USED TO AVOID OVERFILLING THE RECOVERY TANK!**

## 9 TROUBLE SHOOTING

PROBLEM	CAUSE	ACTION
Compressor doesn't start	Power supply cord is not connected Voltage is not correct	Connect the power supply cord Check the power supply at job site
	The float Cable is not well connected with the recovery tank (Red alarm light turns on)	Check and connect the Float Cable properly
	The unit is in high pressure shut off (Red alarm light turns on)	Switch the power switch to the "OFF" position, reduce pressure and then press the button of the High Pressure Switch, then switch the power switch to the "ON" position
	Output pressure is too high	Turn input valve to CLOSED and Purge valve to PURGE, then turn Input valve back to OPEN, Purge valve to RECOVER, and then start the compressor
	The unit is under low pressure protection (Green alarm light turns on)	Input refrigerant and then press the start button to start the compressor
	Failure in motor, or other electrical components	Factory service is required
Compressor starts but cuts off within a few minutes	High pressure shuts off due to wrong operation, such as output valves of the unit or recovery tank are not open	Read carefully this operating manual and follow the instructions, and then press the High Pressure Switch to reset the unit
	Thermal protector disconnected, but axial fan still running	The compressor will restart automatically after the motor is completely cooled
	The circuit breaker has cut off	Press the circuit breaker to reset after two minutes
	The recovery tank is full at 80% capacity	Change a new tank and then press the start button to start the compressor
	Recovery is over and the unit is under low pressure protection	Refer to step 9 of STANDARD LIQUID/VAPOR RECOVERY METHOD, then proceed with self-purge operation
Recovery process too slow	Pressure inside the recovery tank too high	Reduce tank temperature with Recovery Tank Cooling Method
	Compressor seals are worn	Factory service is required
Unit doesn't pull out a vacuum	Connecting hoses are loose	Tighten the connecting hoses
	Leakage in unit	Factory service is required