

# PCE INSTRUMENTS RRU 10 Refrigerant Recovery Device User Manual

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PCE INSTRUMENTS RRU 10 Refrigerant Recovery Device



# **Product Information**

#### Specifications:

• Model: PCE-RRU 10

• Refrigerant Recovery Device

• Weight: 23.2 lbs

• Graphics Code: RR24M

# **Product Usage Instructions**

# **Safety Precautions:**

Before using the recovery unit, please read the manual carefully to understand the safety precautions:

- Only a qualified technician should operate the recovery unit.
- Ensure proper grounding of the equipment before starting.
- Electrical wires must be well connected and grounded by a qualified electrician.
- Power must be cut off and no display on LCD before inspecting or repairing.
- If the power supply cord is damaged, replace it carefully or purchase a new one from the distributor.

#### **Operation Panel:**

The operation panel consists of different parts:

• Closed: Inlet valve is closed

• Recover: Input valve is partially opened

• Fast: Input valve is fully opened

• Purge: Input closed, and output is opened to remove refrigerant

• Mute: Audible alerts and beeps turned off

• Restart: Press START to resume activity after an error

#### **Operating Instruction:**

- 1. Connect the hoses correctly and firmly as per the connection diagram.
- 2. Ensure vapor and liquid valves of AC system and recovery tank are closed.
- 3. Observe low pressure gauge reading, when it reaches -20inHg, LP cutoff turns on, and machine stops work.

#### **GENERAL SAFETY**

#### Use information

- In order to prolong the usage of the recovery unit, please read the manual carefully before using, which can help you 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 can operate this recovery unit.
- Before starting the equipment, make sure that it is weil grounded.
- While using electrical wire, the wire must be weil connected and grounded.
- Only a qualified electrician can do the wire connection according to the technical standard and circuit diagram.
- The power must be cut oft and no display in LCD before inspecting or repairing. If the original power supply cord is damaged, choose carefully for the replacing one, or you may directly buy from the distributor.
- Please take power supply and the capacity of your ammeter and electrical wire.
- Only authorized refillable refrigerant tanks can be used. It requires the use of recovery tanks with a
  minimum working pressure of 45 bar(652.6 psi). 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 electric scale is needed to prevent overfilling.
- Be sure that the place where you are working is thoroughly ventilated.

# Notice

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 and damage the compressor.
- The input pressure of the unit should not exceed 26bar (377.0psi).
- 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 5 bar (72.5 psi).
- If fluid hammer happens in the recovery, please turn the knob slowly to "SLOW" position and do not let reading pressure drop to zero.
- To ensure the stable running of the machine, close the knob to the close postion when the outlet pressure over 27 bar (391.6 psi), to decreasing the inlet pressure (not reach 0). This action is to make the outlet pressure stable or decreasing, the controlled pressure less than 30bar (435.1 psi).
- The equipment is intended for serving air-conditioning and refrigeration systems containing more than
   200 lbs of high-pressure refrigerant.
- The tank and hose used must be complied with the local regulations.

#### **OPERATION MANUAL**

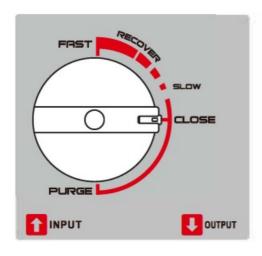
- 1. Do not mix different refrigerants together in one tank, otherwise they could not be separated or used.
- 2. Before recovering the refrigerant, the tank should achieve the vacuum level: -29.6inHg, for purge non-condensable gases. Each tank was full of nitrogen when it was manufactured in the factory, thus the nitrogen should be evacuated before first use.
- 3. The knob should be at "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 the filter specified by our company. High quality filter drier will bring high quality services.
- 5. Specialcaution 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.

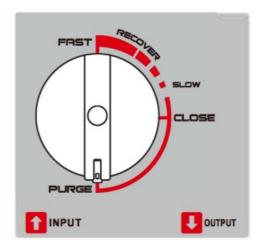
To restart the compressor, please lower the internal pressure (Output gauge indicates lower than 30 bar/435.0 PSI), after the HP cutoff blinks, then Press the "START" button to restart the compressor.

When high pressure protection initiates, please find out 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 stuck——close all the valves and replace the connecting hose.
- 3. The temperature of the refrigerant tank is too high, pressure is too high causing high pressure- make the tank

# INTRODUCTION OF OPERATION PANEL





• 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

#### **Fault: 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 Breaker

• Fault 6: Temperature sensor Short Circuit

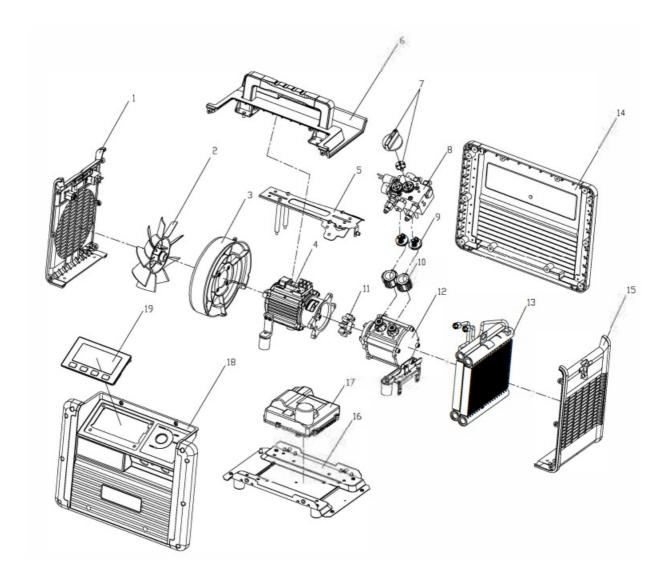
• Fault 7: Temperature protector breaker.

1. Mute: Audible alerts and beeps are turned off

2. Fan: This icon rotates while the machine is running. When the machine stops, the icon is still

3. Restart: It will flash after an error has occurred and settled. Pressing START will resume activity.

#### **PARTS DIAGRAM**



# Parts name

- 1. Left Side Plate
- 2. Fan
- 3. Wind Guide Cover
- 4. Motor
- 5. Support Assy
- 6. Top Plate
- 7. Knob
- 8. Control Assy
- 9. Valve Assy
- 10. Cylinder
- 11. Coupling
- 12. Compressor
- 13. Condenser
- 14. Rear Plate
- 15. Right Side Plate
- 16. Base
- 17. Motor Control
- 18. Front Side Plate

# **SPECIFICATION**

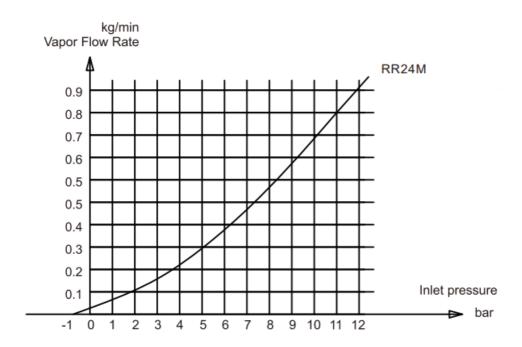
	Category[II: R12,R134a,R401C,R406A,R500,1234YF CategoryIV: R22, R401A, R 401B, R402B, R407C, R407D, R408A,			
	R409A, R502, R509			
Refrigerants	Category V: R402A,R404A,R407A,R407B,R410A,R507, R32			
Power	220V-230V AC, 50/60Hz	11 SV AC, 60Hz		
Maximal Current Draw	6A	12A		
Motor Brushless Motor 1 HP				
Motor Speed	3000 RPM			
Compressor	Oil-less, Air-cooled, Piston			
High Pressure Protector	38.5bar/3850kPa(558psi)			
Operating Temperature	32 104°F			
Dimensions	14.5×9.9×11.7 inch			
Net Weight	23.2 lbs			

# NRDD

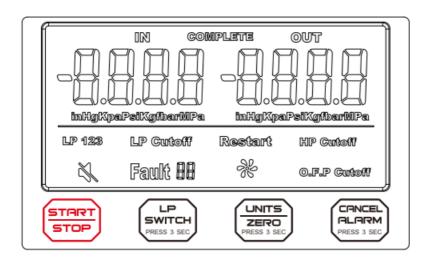
Refrigerants	R134a	R22	R410A
Liquid	2.6 kg/min	2.9 kg/min	3.9 kg/min
Push/Pull	7.5 kg/min	8.5 kg/min	9.5 kg/min

# **Notice**

The vapor flow rate is proportioned to inlet pressure.

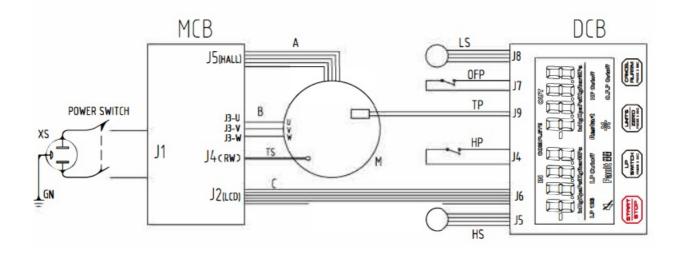


#### INTRODUCTION OF OPERATION PANEL



- 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 automatic restart) If the inlet pressure is lower than -20 inHg for 20 seconds the unit will shutdown "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)
- **O.F.P Cutoff:** Will Light up when the recovery cylinder is 80% filled, or if the OFP cable is shorted. The machine will stop running
- LP Cutoff: Will light up when low-pressure switch is activated for more than 20 seconds below -20 in Hg
- HP Cutoff: Will Light up when high-pressure switch is activated above 560 Psi

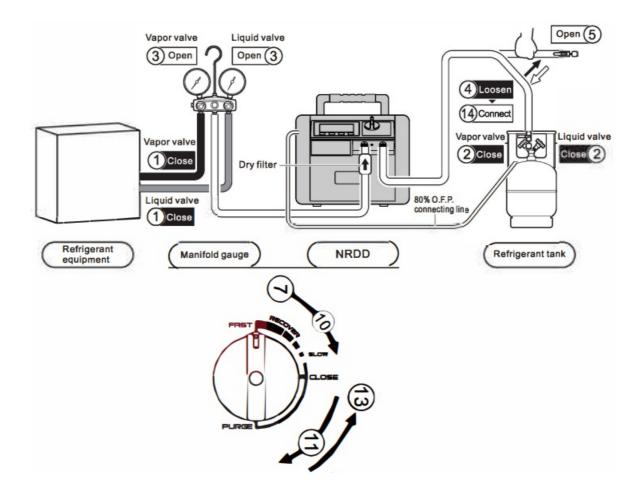
#### **WIRING DIAGRAM**



Graphics Code	ITEM	
HS	High Pressure Sensor	
M	Motor	
MCB	Motor Control Board	
XS	Socket	
DCB	Digital Gauge Control Board	
LS	Low Pressure Sensor	
OFP	Over Filling Protector	
ТР	Temperature Protector	
HP	High Pressure Switch	
TS	Temperature Sensor	

# **OPERATING INSTRUCTION**

Refrigerant hoses exhaust



#### 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.

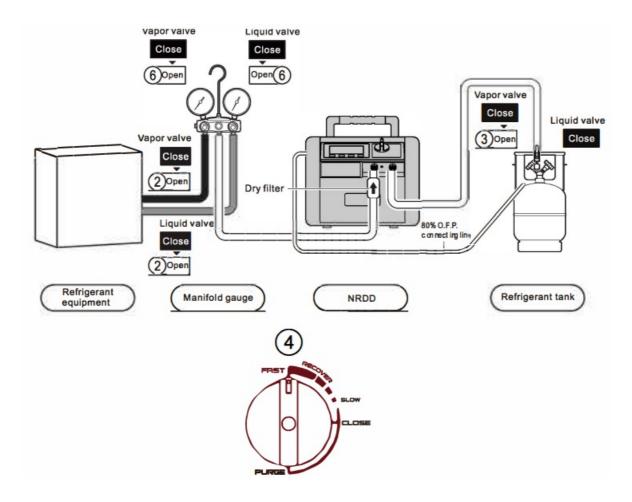
#### Start operation

- 6. Plug in the machine, turn on the power, and the LCD shows pressures.
- 7. Turn the knob to "Recover".
- 8. Press the "START" button to start machine, it begins to purge inner air of the hose.
- 9. Observe the reading of the low pressure gauge when it reaches to -20inHg, after 20 seconds, LP cutoff turns on and the machine stops work.
- 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. Connect the refrigerant hose to the tank.

#### Recovery mode



#### 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. Turn the knob to "Recover".
- 5. Press the "START" button to start machine.
  - 1. If recover liquid refrigerant, please open the liquid valve of the manifold gauge.
  - 2. If recover vapor refrigerant, please open the vapor valve of the manifold gauge.
- 6. The recovery modewill be finished when machine runs to certain vacuum degree or automatic close of low pressure protection. Do not turn off the power after recovery finished and directly run self purging mode.

#### **Notice**

Olf fluid hammer happens in the recovery, please turn the knob to "Slow" position slowly, Then the reading of low pressure gauge drops until fluid hammer stops; but do not let reading pressure drop to zero, otherwise inlet port is not pumping once at zero pressure.

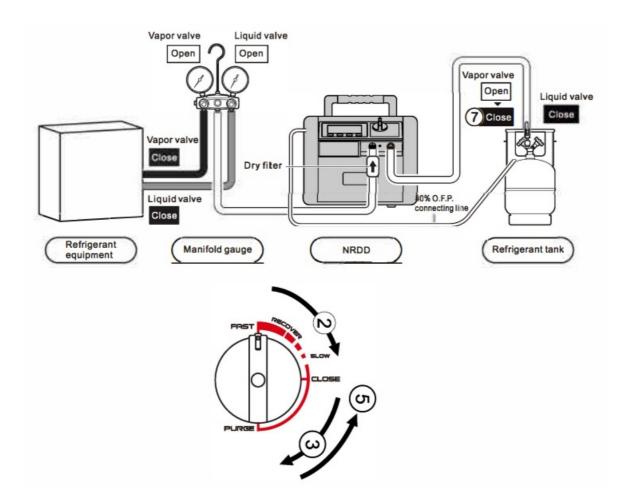
If it is difficult to start, turn to \* CLOSE \* when liquid, turn to " PURGE" when vapor, then press" START " to restart the machine, and turn to the required position.

# Self-purge mode

#### **Notice**

The unit must be purged alter each use; Liquid refrigerant remained may expand and damage the components and

pollute the environment.



# Start operation

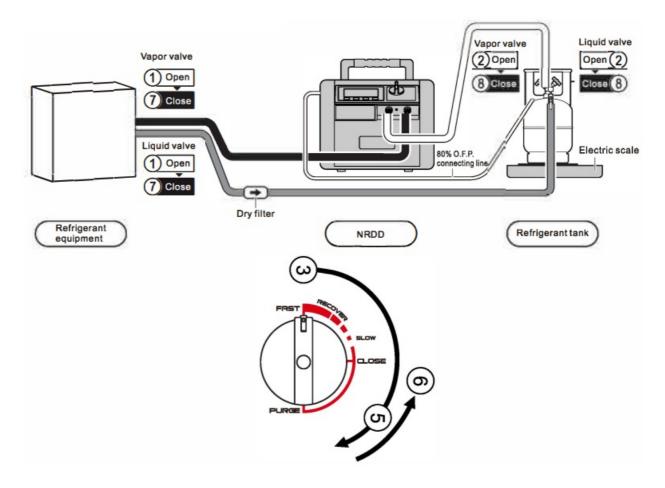
- 1. The machine stops automatically after recovery finished with LP cutoff on.
- 2. Turn the knob to "Close" and the LP cutoff blinks, press" START" button to start the machine.
- 3. Turn the knob to "Purge" and start seif purging.
- 4. The seif purging mode will be finished when machine runs to certain vacuum degree.

# 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. Glose the wpor valve of the tank.
- 9. Disconnect all hoses.

# Liquid push/pull mode

Notice: An electric scale is needed to monitor the recover process to prevent overfilling.



# 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 vaporvalve, liquid valve of the HVAC system
- 2. Open the vapor valve, liquid valve of the tank.
- 3. Turn the knob to "Recover".
- 4. Press "START" button to start machine, then it starts liquid push/pull mode. 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

# **TROUBLESHOOTING**

Problem	Cause	Solution
LCD does not work aft er power is on	Power cord is damaged.	1. Replace cord.
	2. Inner connection is loose.	2. Check the connection.
	3. Connect to J6 is damaged.	3. Replace the connect.
	4. Malfunction of circuit board.	4. Replace MCB or DCN circuit board. Contact VAL UE tech support.
Machine does not run after pressing START	HP Cutoff, or OFP Cutoff w orks (screen shows).	Check if the connection between HP or OFP to DCB is good.
	2. Fault 2 or Fault 3.	2. Adjust to correct voltage.
	3. Fault 4, too much start-overl oad.	3. Turn to "CLOSE" when liquid, turn to "PURGE" when vapor, then press "START" to restart.
	4. Fault 5.	4. Check if the connection between TS and MCB is good. If good, contact VALUE tech support.
	5. Fault 6.	5. Check if TS connection is damaged. If not, conta ct NAVAC tech support.
	6. Fault 7.	6. Check if the connection between TP and MCB is good. If good, contact NAVAC tech support.
	7. Button is damaged.	7. Replace digital gauge.
	8. Circuit board is damaged.	8. Replace circuit board.
Machine stops after ru nning a period of time	Misoperation causes HP Cu toff.	Refer to clause 6 of OPERATION MANUAL.
	2. Thermal protector is on and shows Fault 7.	2. When Fault 7 and Restart flash, press START.
	3. Refrigerant is 80% in the tank, and O.F.P Cutoff shows.	3. Replace the tank. When O.F.P Cutoff and Restar t flash, press START.
	4. Recovery work is finished. L P Cutoff shows.	4. Could restart for other work.
E1 shows at LP or HP	Pressure sensor is not connected well or is short circ uit.	Check if the connection between LS or HS to DCB is good. If good, replace pressure sensor.
Slow recovery rate	The pressure of the refriger ant tank is too high.	Cooling the tank helps decrease the pressure.
	2. Piston ring of compressor is damaged.	2. Contact VALUE tech support.
Not evacuate	1. Connection hose is loose.	1. Tighten the connection hoses.
	2. Machine leaks.	2. Contact VALUE tech support.

# Disposal

• For the disposal of batteries in the EU, the 2006/66/EC directive of the

- European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.
- In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company that disposes of the devices in line with law.
- For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.
- If you have any questions, please contact PCE Instruments.

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#### **FAQ**

#### Q: What should I do if the power supply cord is damaged?

A: Choose a replacing cord carefully or purchase one from the distributor to ensure safety.

#### Q: Who should operate the recovery unit?

A: Only a qualified technician should operate the recovery unit to prevent hazards.

#### **Documents / Resources**



PCE INSTRUMENTS RRU 10 Refrigerant Recovery Device [pdf] User Manual RRU 10, RRU 10 Refrigerant Recovery Device, RRU 10, Refrigerant Recovery Device, Recover y Device, Device

# References

- France.fr : Explore France and its wonders Explore France
- O iberica.es
- Make an offer on the domain instruments.co.uk Domains.co.uk
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- User Manual

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