TRADE PRO

FOR INDUSTRY PROFESSIONALS

TP-MM1
Refrigerant Recovery Machine

User Manual

Explanation of Safety Signal Words

 **DANGER :** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING :** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION :** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION : Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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Safety Precautions

WARNING: To prevent personal injury,

ALLOW ONLY QUALIFIED PERSONNEL TO OPERATE THE UNIT. Before operating the unit, read and follow the instructions and warnings in this manual. The operator must be familiar with air conditioning and refrigeration systems, refrigerants, and the dangers of pressurized components. If the operator cannot read this manual, operating instructions and safety precautions must be read and discussed in the operator's native language.

– Si el operador no puede leer las instrucciones, las instrucciones de operación y las precauciones de seguridad deberán leerse y comentarse en el idioma nativo del operador.

– Si l'utilisateur ne peut lire les instructions, les instructions et les consignes de sécurité doivent lui être expliquées dans sa langue maternelle.

PRESSURIZED TANK CONTAINS LIQUID REFRIGERANT. Do not overfill the internal storage vessel, because overfilling may cause explosion and personal injury or death. Do not recover refrigerants into nonrefillable containers; use only federally authorized refillable containers (DOT spec. 4BW or 4BA).

HOSES MAY CONTAIN LIQUID REFRIGERANT UNDER PRESSURE. Contact with refrigerant may cause personal injury. Wear protective equipment, including safety goggles. Disconnect hoses using extreme caution.

DO NOT BREATHE REFRIGERANT AND LUBRICANT VAPOR OR MIST. Exposure may cause personal injury, especially to the eyes, nose, throat, and lungs. Use the unit in locations with mechanical ventilation that provides at least four air changes per hour. If accidental system discharge occurs, ventilate the work area before resuming service.

TO REDUCE THE RISK OF FIRE, use the shortest possible extension cord with a minimum size of 14 AWG. An extension cord may overheat and cause fire.

TO REDUCE THE RISK OF FIRE, do not use the unit in the vicinity of spilled or open containers of gasoline or other flammable substances.

DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR LEAK TEST THE UNIT OR AIR CONDITIONING SYSTEM. Some mixtures of air and refrigerant are combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing personal injury or property damage.

TO PREVENT CROSS-CONTAMINATION, DO NOT MIX REFRIGERANT TYPES through a system or in the same container; mixing of refrigerants will cause severe damage to the recovery unit and the system being serviced.

ELECTRICITY INSIDE THE UNIT HAS A RISK OF ELECTRICAL SHOCK. Exposure may cause personal injury. Disconnect the power before servicing the unit.

Understanding Refrigerant Recovery

Refrigerant recovery is the process of taking refrigerant out of a system and storing it in a tank. The following is critical information regarding how to quickly achieve the best refrigerant recovery results.

1. Identify the refrigerant type and quantity in the system that is to be serviced.

2. TP-MM1 is approved for use with the following catagory III, IV, and V refrigerants (per ARI 740):

R-12	R-402A	R-407C	R-411B
R-22	R-402-B	R-407D	R-412
R-134A	R-404A	R-408A	R-500
R-401A	R-406A	R-409A	R-502
R-401B	R-407A	R-410A	R-507
R-401C	R-407-B	R-411A	R-509

3. **⚠ CAUTION: Always use a filter and replace it frequently. Failure to use a filter will invalidate your warranty. It is recommended that a clean filter be used for every service job. A filter will prevent contamination from entering the TP-MM1, which will reduce the risk of damage. Each filter needs to be labeled and used for one type of refrigerant only.**

4. **⚠ WARNING: Open service and cylinder valves slowly. This allows for rapid shut off of gas flow if there is any danger. Once it is determined that there is no danger, the valves can be fully opened.**

5. Isolate large amounts of refrigerant and close off valves after use. If a leak develops in the system, the refrigerant will not escape.

6. **⚠ CAUTION: Keep all connections to the refrigeration system dry and clean. Damage will occur if moisture is allowed to enter the system.**

7. TP-MM1 has an internal pressure shutoff switch. If system pressure goes above 550 psi, the unit shuts off. The shutoff switch automatically resets after pressure drops below 300 psi.

   ⚠ WARNING: The internal pressure shutoff switch does not prevent tank overfill. If the TP-MM1 shuts off automatically and is connected to a tank, the tank may be dangerously overfilled. Immediately relieve this high pressure and / or tank overfill situation.

8. If tank pressure exceeds 300 psi, use the tank cooling process as described in this manual to reduce the tank pressure.

9. When recovering large amounts (20 lbs. or more) of liquid refrigerant, use the Push/Pull method as described in this manual.

10. All refrigerant systems are likely to have areas where liquid can be trapped, which significantly slows the recovery process. Use the method described in this manual to locate and recover trapped liquid refrigerant.

11. To achieve the deepest final vacuum, use the tank cooling method to lower the head pressure on a recovery tank). *NOTE: The cooling method will not work if there is no liquid in the recovery tank. In this case, use an empty tank that has been fully evacuated to achieve the final vacuum level required.*

12. To maximize recovery rates, use the shortest hose length possible (no longer than 3 ft. is recommended) and 3/8" diameter (or larger). Remove unnecessary hose core depressors and Schrader valves from port connections, because these can restrict flow up to 90%.

Recovery Tank Information

1. NEVER use a standard disposable 30 lb. tank (the type of container in which virgin refrigerant is sold) to recover refrigerant. Use ONLY authorized refillable refrigerant tanks. Federal regulations require refrigerant to be transported only in containers meeting DOT specs. 4BW or 4BA.

2. **Warning: To prevent personal injury, do not exceed the working pressure of each cylinder.** Recovery cylinders are designed for different pressures. The TP-MM1 is not supplied with a recovery tank, and requires the use of tanks with a minimum of 350 psi working pressure. The manufacturer strongly recommends the use of 400 psi tanks.

   NOTE: When recovering R-410A refrigerant use of a 400 psi tank is mandatory. (Refer to Recovery Tanks under the Parts and Accessories section in this manual.)

3. Tanks and filters must be designated for one type of refrigerant only. Before using a tank previously used for another refrigerant, completely empty the tank, and evacuate it. Then purge the tank using dry nitrogen, and evacuate again.

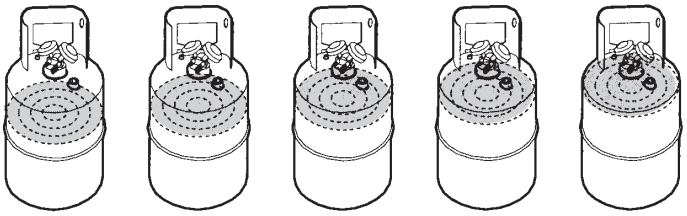
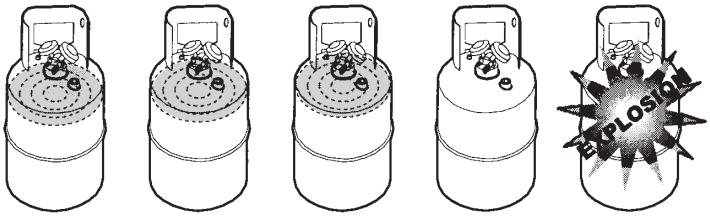
4. Store refrigerant containers in a cool, dry place.

5. Some storage cylinders have valves that are not seated when manufactured. Keeping caps on valves guards against refrigerant leakage.

6. Do not exceed 80% of tank capacity. The manufacturer strongly recommends the use of a refrigerant scale for monitoring tank capacity. Safety codes recommend that closed tanks not be filled over 80% of volume with liquid. The remaining 20% is called head pressure room.

7. If you expect temperatures in excess of 135° F, contact the refrigerant supplier.

WARNING: NEVER TRANSPORT AN OVERFILLED CYLINDER.
Refrigerant expands when it gets warm, and can cause a tank to explode if overfilled.

CYLINDER TEMPERATURE	60°F	70°F	100°F	130°F	150°F
STARTING WITH CYLINDER 80% BY VOLUME					
SPACE OCCUPIED BY LIQUID	80%	81%	83%	90%	94%
STARTING WITH CYLINDER 90% BY VOLUME					
SPACE OCCUPIED BY LIQUID	90%	92%	96%	100%	

Purging Non-Condensable Gases from Refrigerant Tanks

1. Allow the tank to sit undisturbed for 24 hours to let any air rise to the top.

2. Connect a manifold to the tank to read the amount of pressure in the tank.

3. Determine the ambient temperature in the room.

4. Refer to a refrigerant pressure/temperature chart. Find the temperature on the chart and look across to the corresponding pressure for the type of refrigerant in the tank. Determine how that relates to the reading on the gauge.

5. If the pressure reading is higher than the pressure shown on the chart, very slowly (to cause as little turbulence inside the tank as possible) open the vapor port valve slightly. Watch the pressure on the gauge decrease. To prevent venting, add 4-5 psi to the pressure shown on the chart. When the gauge corresponds to that pressure, close the vapor port valve.

6. Allow the tank to sit for 10 minutes; then check the pressure again.

7. Repeat the process as needed.

Maintenance

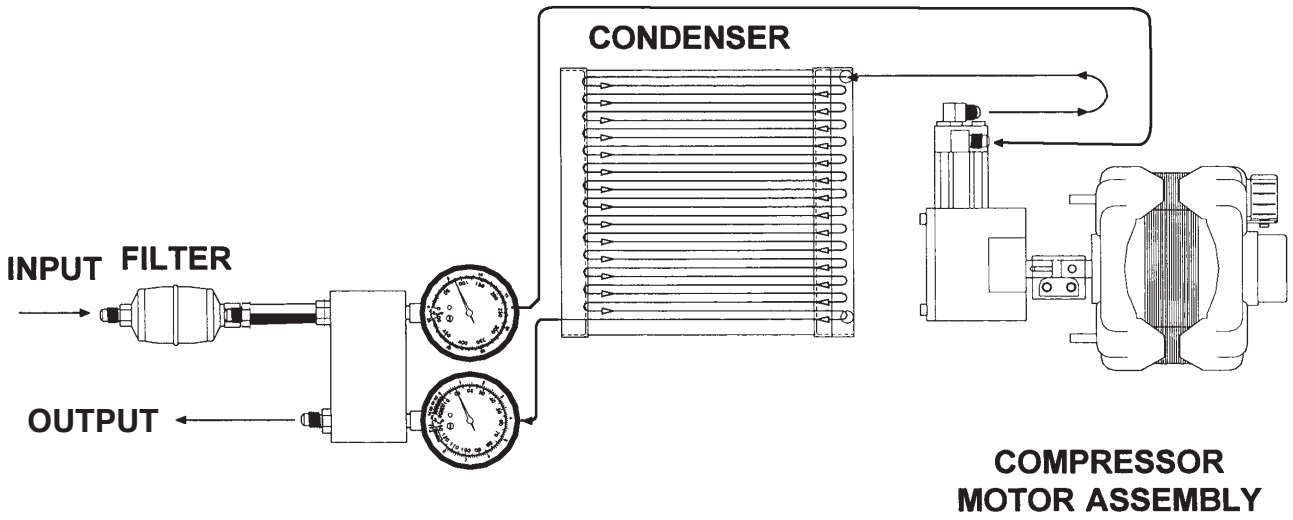
WARNING: To prevent personal injury,

- **Disconnect the TP-MM1 from its power supply before beginning maintenance.**

CAUTION: To prevent equipment damage,

- **A filter/dryer MUST be used between the TP-MM1 and the inlet hose. (See flow diagram below.) Failure to use a filter will invalidate the TP-MM1 warranty.**
- **Extra filtration is recommended when recovering refrigerant from a contaminated system. The manufacturer recommends using two high-acid capacity filters (such as Alco type EK-162-F or Sporlan type C-162-F) in series. When finished recovering refrigerant, flush the TP-MM1 with a small amount of clean refrigerant and refrigerant oil to purge contamination from the unit.**
- **Empty all refrigerant from the TP-MM1 into a storage tank. Liquid refrigerant left in the TP-MM1 condenser may expand, damaging components.**
- **If the TP-MM1 is to be stored or not used for a period of time, completely evacuate any residual refrigerant, and purge the unit with dry nitrogen.**

Refrigerant Flow Diagram



Operating Instructions

1. Inspect the TP-MM1 thoroughly to ensure it is in good operating condition.

2. Place the TP-MM1 on a flat, level surface, and make tight connections as shown in the set-up diagram below.

3. Slowly open the liquid port of the recovery cylinder to check hoses and connections for leaks.

4. Set the Recover/Purge valve to RECOVER.

5. Open the output port of the TP-MM1.

6. Open the liquid port on the manifold gauge set.

NOTE: Opening the liquid port will remove liquid from the system first, greatly reducing the recovery time. After the liquid has been removed, open the manifold vapor port to finish evacuating the system. See diagram below.

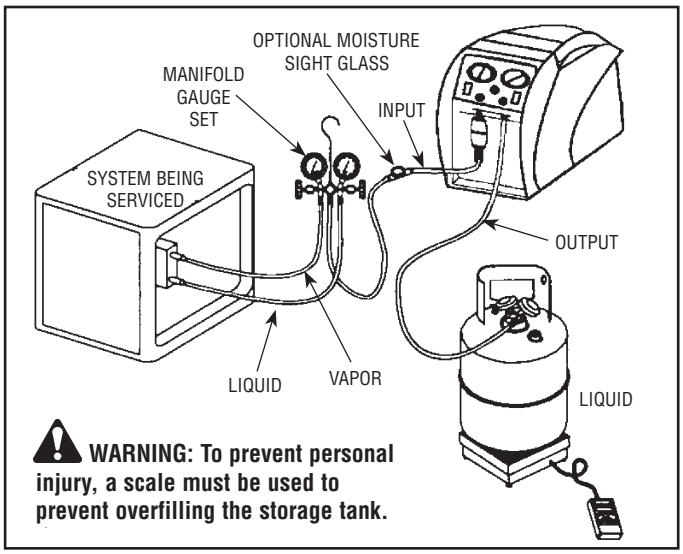
7. Connect the TP-MM1 to a 115V outlet.
   a. Switch the main power switch to the ON position. You will hear the fan running.
   b. Press the compressor start switch. This "momentary" switch starts the compressor. It may be necessary, under certain circumstances, to press this switch more than once to start the compressor.

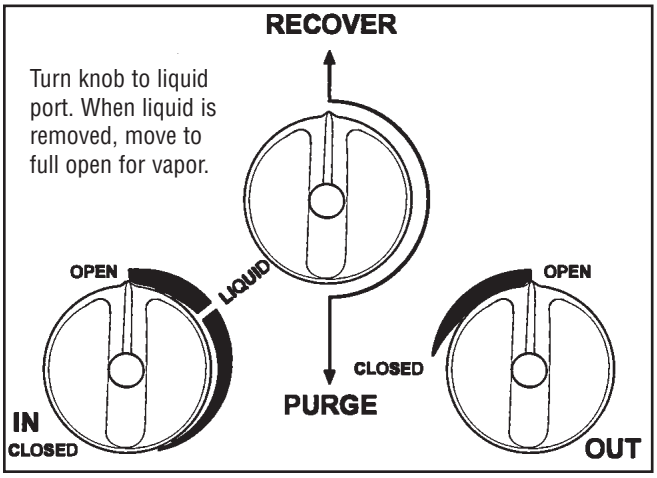
8. Slowly open the input port on the TP-MM1. Once the liquid has been removed from the system, open the input valve fully. The manifold gauge set vapor port should also be opened at this time.

   CAUTION: If the compressor begins to knock, slowly throttle back the input valve until the knocking stops. This will damage the TP-MM1 if not controlled.

9. Run the TP-MM1 until desired vacuum is achieved.
   a. Close the vapor and liquid ports on the manifold gauge set.
   b. Close the TP-MM1 input port.
   c. Proceed with the self-purge procedure as described in this manual.

NOTE: If the recovery process is very slow, and frost or condensation is visible on some plumbing or components of the system, this is a sign of trapped liquid refrigerant. Use a heat gun to vaporize this trapped liquid. If you can't determine where the trapped liquid is, turn the system compressor on for a few seconds to move the liquid and generate heat to vaporize it.





Self-Purge

1. Close the ports of the system being serviced.
2. Close the input port on the TP-MM1.
3. Turn off the TP-MM1.
4. Set the Recover/Purge valve to PURGE.
5. Restart the TP-MM1.
6. Run until desired vacuum is achieved.
7. Close the ports on the recovery tank and the TP-MM1. *NOTE: Close the outlet port on the TP-MM1 before turning off the unit, or refrigerant will backfill into the unit.*
8. Turn the TP-MM1 off.
9. Set the Recover/Purge valve to RECOVER.
10. Disconnect and store all hoses.
11. Replace the in-line filter on the TP-MM1 after every job.

Push / Pull Method Instructions

The push/pull method removes bulk liquid from a system using the pressure differential created by the TP-MM1.

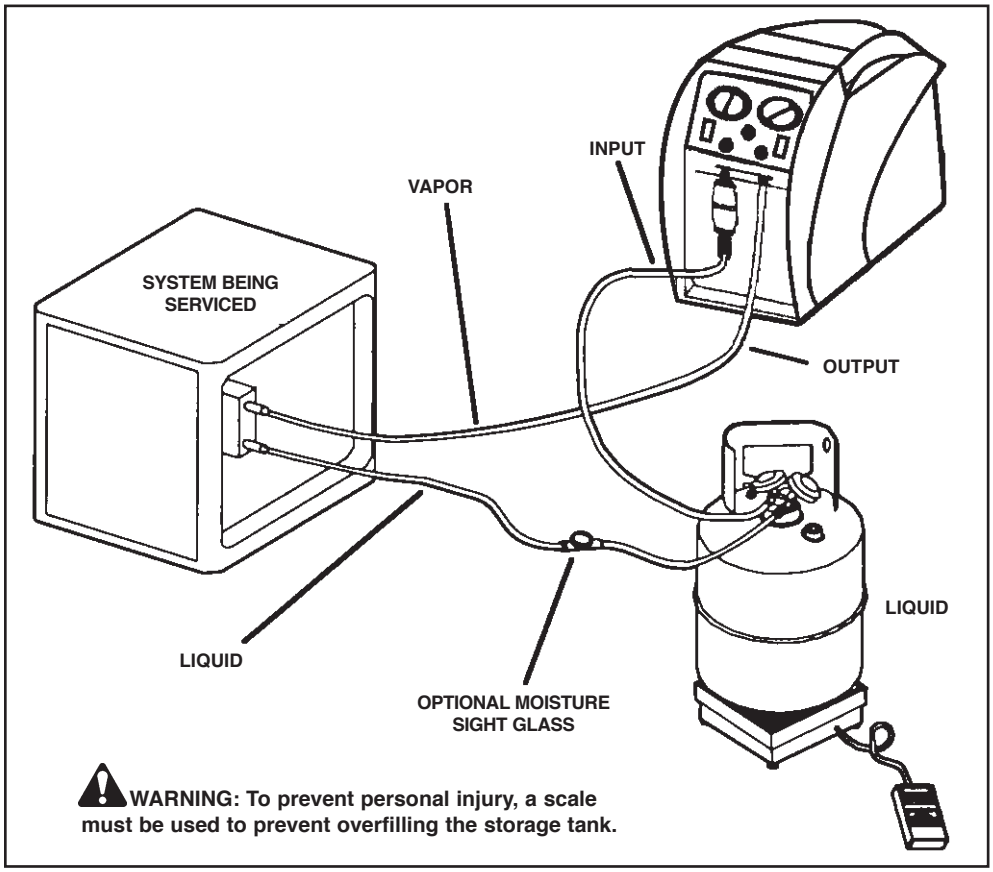
Push/pull only works with large systems where the liquid is readily accessible. Do not use this method on a system that contains less than 15 lbs. of refrigerant, because it will not have the bulk liquid in the reservoir needed to create a pressure differential. This method is used on systems with a receiver tank, or with greater than 20 lbs. of refrigerant, or when transferring from one tank to another. Refer to the diagram below.

The rate of liquid transfer is best when using larger hoses, and cooling the tank to lower the pressure in it. Cooling the tank can be done before or during recovery, and the tank must be partially filled with refrigerant (minimum of 5 lbs.). Begin by throttling the output valve, then adjust the back pressure to suit the conditions and the refrigerant.

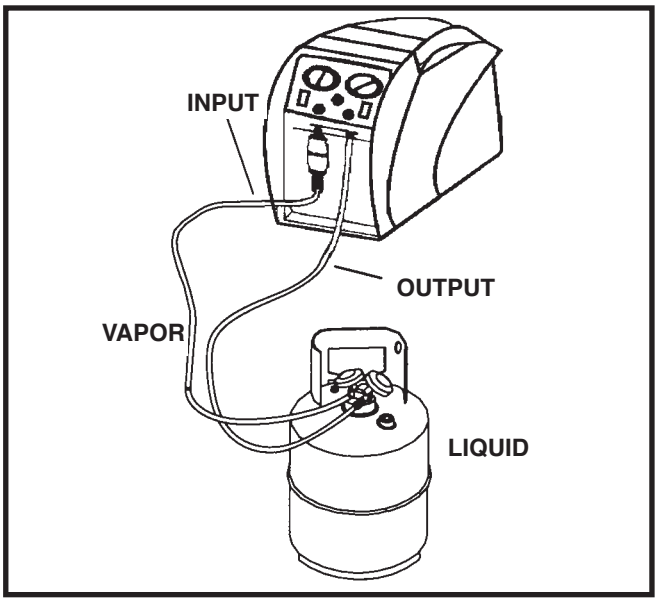
Five to ten minutes of this cooling process will improve the flow rate considerably. The greater the quantity of refrigerant in the tank, the longer the process will take. If there are any non-condensable gases in the tank, this cooling process will not work. Refer to the diagrams on page 12.

The sight glass provides a method of determining the moisture content and quality of a system's refrigerant.

⚠ WARNING: When using the push/pull method, once the pressure differential has begun, it can continue and overfill the storage tank even if the tank is equipped with a float level sensor. The pressure differential will continue to move liquid and vapor even when the machine is turned off. You must manually close the valves on the tank and the unit to prevent overfilling the recovery tank and possible personal injury.

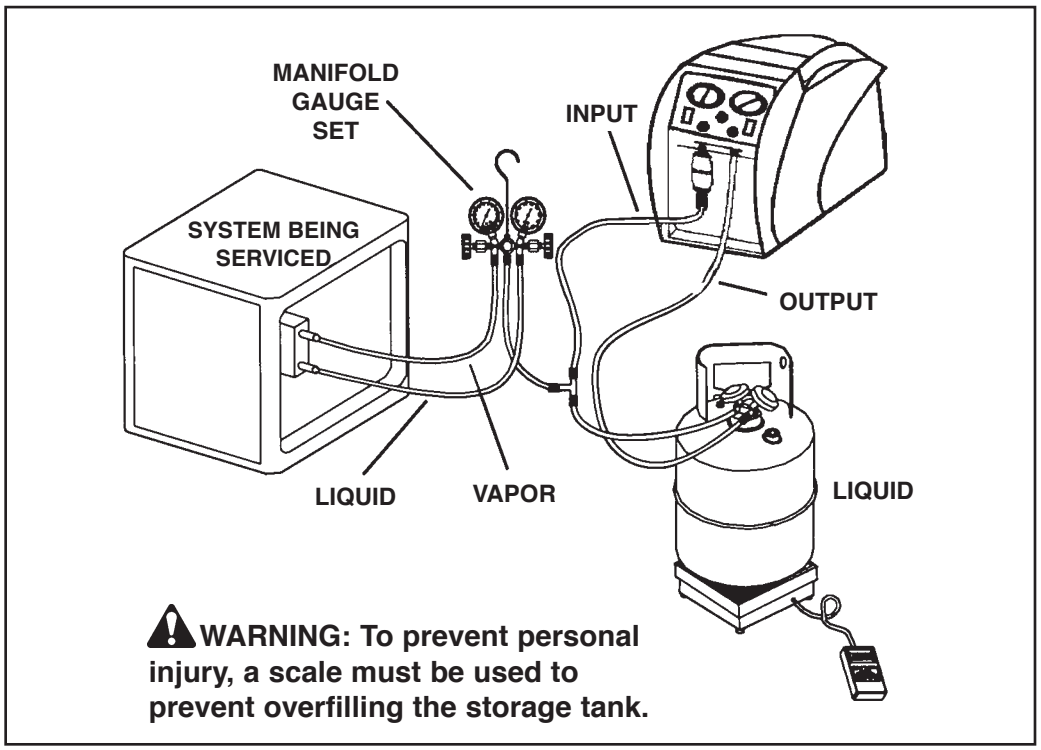


Tank
Pre- or Sub-cooling Instructions



1. This process requires a minimum of 5 lbs. of liquid refrigerant in the tank.
2. Throttle the output valve until the output pressure is 100 psi greater than the input pressure, but never more than 300 psi.
3. Run until the tank is cold.

Recovery / Tank
Pre- or Sub-cooling for a Fixed Hose Setup



NORMAL RECOVERY:
Tank vapor valve is closed.

TANK PRE- OR SUB-COOLING:
Tank vapor valve is open, and both manifold gauge set valves are closed.

Refrigerant Recycling

Current regulations state that used refrigerant must not be sold, or used in a different owner's equipment, unless the refrigerant has been laboratory analyzed and found to meet the requirements of ARI 700 (latest edition).

If the refrigerant is to be used again in the same system, it is best to clean it as much as possible. The manufacturer recommends using the largest, high-acid capacity filter possible. Place the filters on the suction (inlet side) of the TP-MM1, and replace them often.

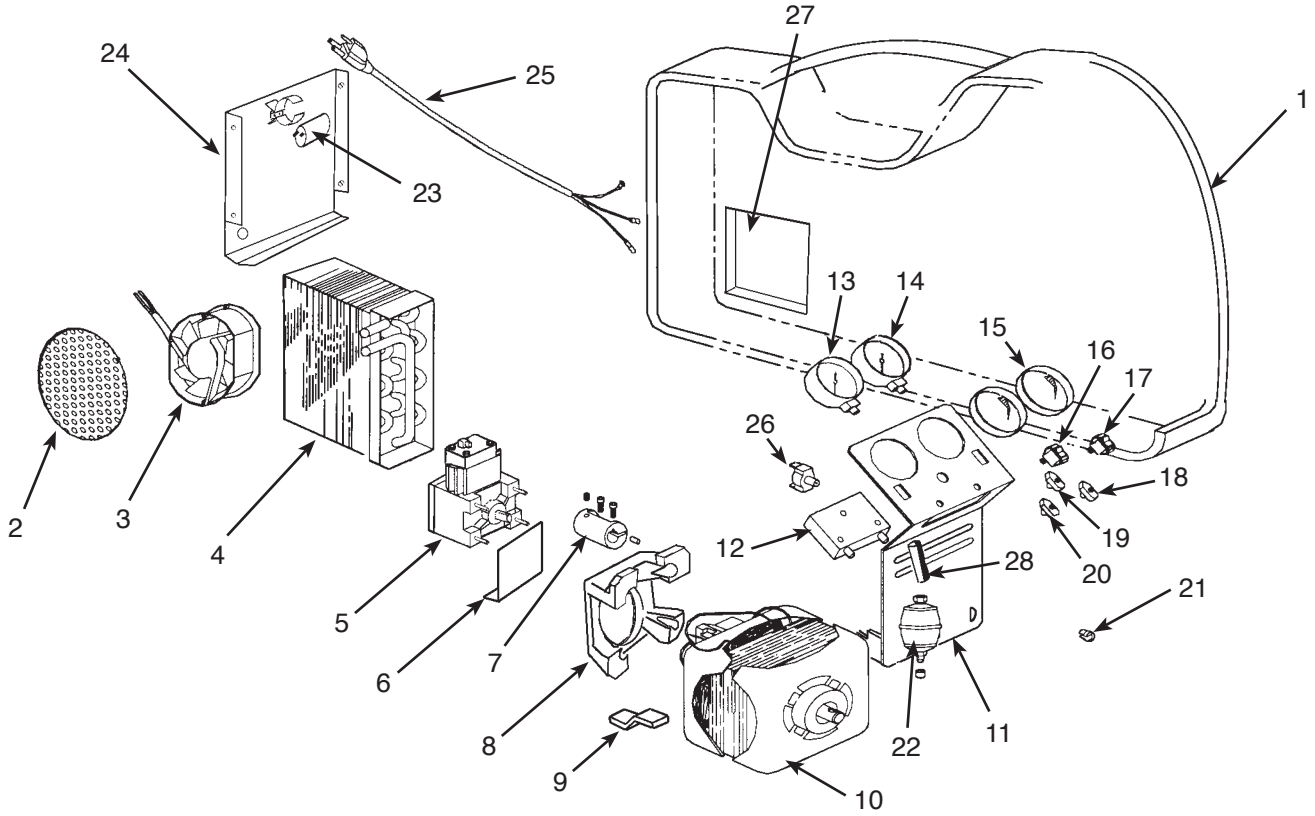
Some systems do not have an adequate oil separator installed, so the refrigerant will contain oil as it is recovered. If the refrigerant is not going to be used in the same system and it contains oil, you need to separate the oil from the refrigerant. This allows you to measure the amount of oil that needs to be charged back into this system. To do this:

⚠ **WARNING: Wear safety goggles and other protective equipment to prevent burns from acidic oil.**

1. Begin with a 30 lb. or 50 lb. tank in-line with the TP-MM1.
2. Connect the system to the liquid port of the tank.
3. From the vapor port of the tank, connect to the input of the TP-MM1.
4. Connect another tank (for storing refrigerant) to the output of the TP-MM1.
5. Begin the recovery process.

   NOTE: If it's a large amount of liquid refrigerant, place a band heater around the first tank.
6. When the recovery process is complete, the oil in the first tank can be removed by using a small amount of nitrogen to apply pressure to one of the ports. The oil will expel from the other port. Turn the tank upside down if removing oil through the vapor port.

Parts List

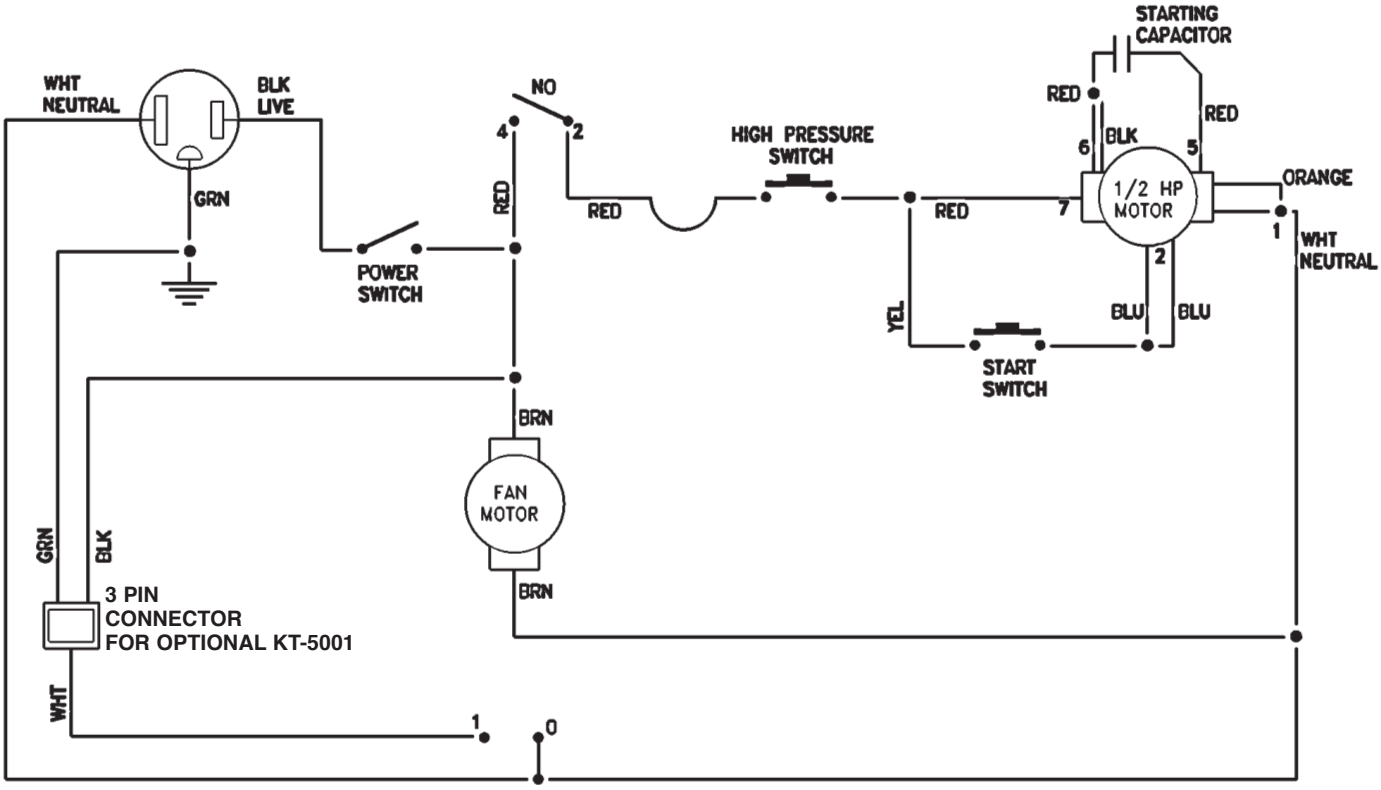


Item	Description	Part #
1	Plastic Case, RH	573946
	Plastic Case, LH	573945
2	Fan Grill, Outlet	100179
3	Axial Fan	100119
4	Condenser	100139
5	Compressor	CP1320
6	Compressor Bracket	100207
7	Coupler	CP1315
8	Bell Housing	CP1001
9	Motor Bracket	100209
10	Motor	EL1821
11	Front Panel	573952-1
12	Manifold	700009
13	Input Gauge	GA1500
14	Output Gauge	GA0800
15	Gauge Lens	GA1000
16	On/Off Switch	EL1310
17	Start Switch	EL1309
18	Red Knob	100124
19	Black Knob	100122
20	Blue Knob	100123
21	Flare Cap	NB6501
22	Filter	100343
23	Capacitor	EL1412
24	Rear Panel	573952-2
25	Cord Set	100162
26	Pressure Switch	EL2802
27	Fan Grill, Inlet	100180
28	Hose Assembly	100345

Replacement Kits & Accessories

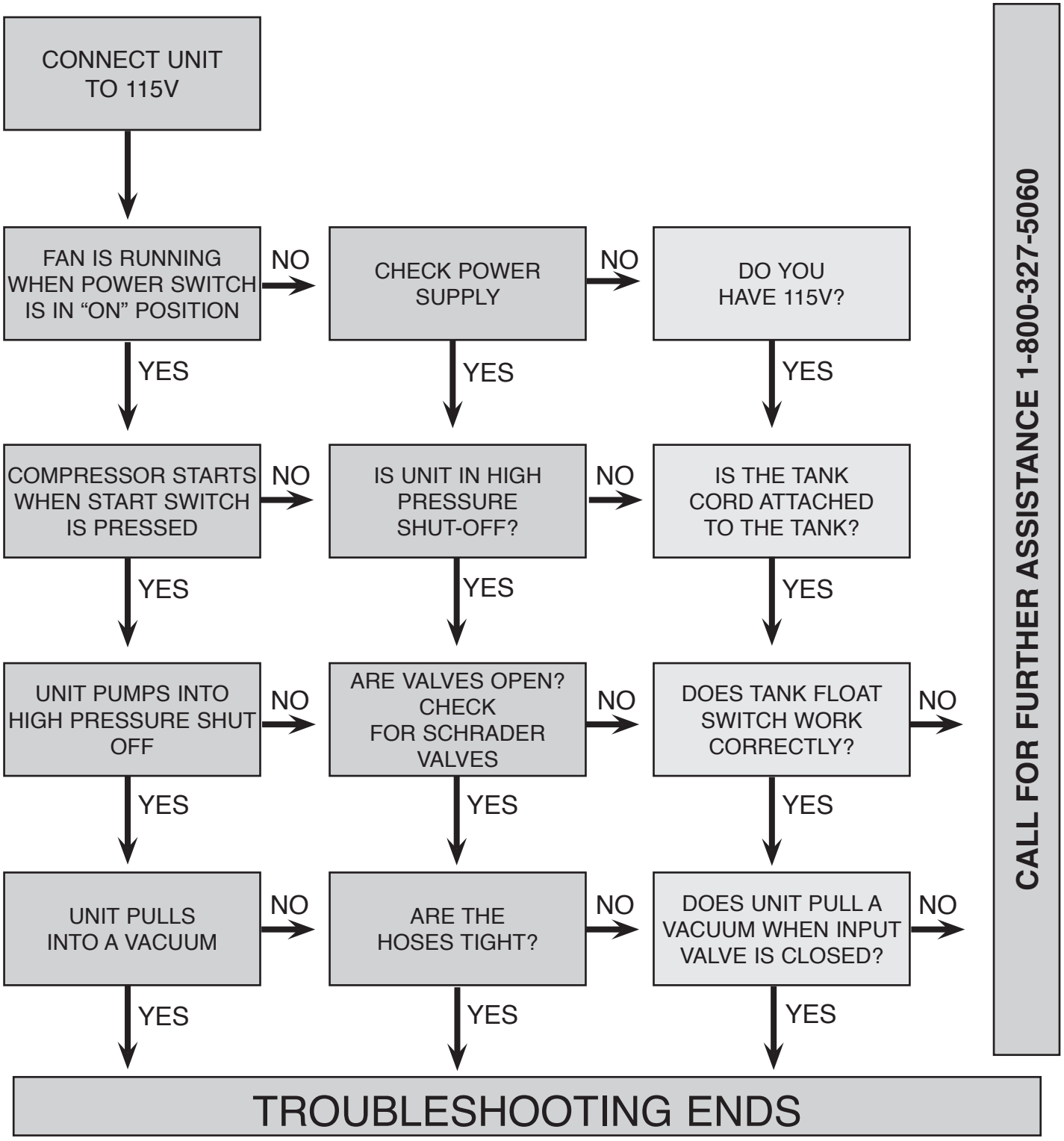
PART#	DESCRIPTION
KT3302	Piston Seal Replacement *(middle section of compressor)*
KT3303	Valve Replacement Kit *(top section of compressor)*
KT3307	Compressor Repair Kit *(all three sections of compressor)*
KT3308	Shaft Replacement Kit *(bottom section of compressor)*
17605	30 lb. Recovery Tank (350 psi working pressure) with capacity sensor
17121	Same as 17605, without sensor
17572	50 lb. Recovery Tank (350 psi working pressure) with capacity sensor
17506	Same as 17572, without sensor
TIF9020	Refrigerant Scale, 200 lb. capacity, with removable platform

Wiring Diagram



Troubleshooting

WARNING: To prevent personal injury and / or equipment damage, read and understand all safety information contained in this manual before servicing the unit.



Notes

Notes

One-Year Warranty

MFG # _____

This product is warranted to be free from defects in workmanship and materials for a period of one year from date of purchase.

THE FOLLOWING RESTRICTIONS APPLY:

1. The warranty applies to products in normal use only, as described in the operating manual. The product must also be serviced and maintained as described therein.

2. If the product fails, it will be replaced at the option of the manufacturer.

3. Warranty service claims are subject to factory inspection for product defect(s). If during the warranty evaluation it is determined that a filter has not been used, or that the filter was not correctly maintained, or that the machine has been used in any way other than the purpose for which it was designed, the manufacturer reserves the right to void the warranty.

4. All warranty claims must be made within the warranty period. Proof of purchase must be supplied. This warranty is non-transferable.

5. Please note that the warranty does not apply if the product or product part is damaged by accident, misuse, tampered with, or modified in any way.

6. Normal wear items (seals, filters, etc.) are specifically excluded from warranty, unless found by the manufacturer to be defective.

WARRANTY SERVICE

This warranty is given by Robinair.
Service under this warranty must be obtained by the following steps:

1. Outside the U.S.A., contact your local distributor.
2. Inside the U.S.A., call 1.800.327.5060 for a return material authorization (RMA) number.

Manufactured by:

Robinair
655 Eisenhower Drive
Owatonna, MN 55060

HVAC Technical Service:1-800-327-5060

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