

Pro-Set® **cps**®

Pro-Set® **TR21 SERIES** **2 Cylinder Commercial** **Refrigerant Recovery Machine**



OWNER'S MANUAL (English)

Français, Español, Deutsch and latest updates: www.cpsproducts.com

Series: TR21, TR21C, TR21E, TR21J, TR21S

TO BE OPERATED BY QUALIFIED PERSONNEL ONLY



Evaluated for performance in accordance with Sec. 600 of the Clean Air Act (Feb 29, 1996) using AHRI-740-98 test methods.



THIS EQUIPMENT HAS BEEN VERIFIED BY UNDERWRITERS LABORATORIES INC. TO MEET EPA'S MINIMUM REQUIREMENTS FOR RECOVERY EQUIPMENT INTENDED FOR USE WITH ALL SYSTEMS CONTAINING REFRIGERANTS FROM ARI740-98 CATEGORIES III, IV, AND V. UL CONTROL NUMBER 2HA5.

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KEY FEATURES

- Maintenance free oil-less compressor design
- Aesthetically unique industrial type styling
- Precision machined from aluminum and steel components
- Permanently lubricated and sealed main bearings
- Improved piston seal design for less leakage and deeper vacuums
- 550 psig high pressure cutoff switch with LED indicator
- Cleanable 100 mesh inlet filter
- Weighs less than 25 lbs.
- Fastest recovery rates in its class
- Patent pending cooling system design improves compressor longevity
- Patent pending head design for superior performance

GENERAL SAFETY INSTRUCTIONS

Please read, follow and understand the contents of this entire manual, with special attention given to Danger, Warning and Caution statements.

FOR USE BY PROFESSIONALLY TRAINED AND CERTIFIED OPERATORS ONLY. MOST STATES, COUNTRIES, ETC., MAY REQUIRE USER TO BE LICENSED. PLEASE CHECK WITH YOUR LOCAL GOVERNMENT AGENCY.

- DANGER:** The recovery tank used with this contains liquid refrigerant. Overfilling recovery tank may cause a violent rupture resulting in severe injury or even death. **As a minimum, please use a scale to continuously monitor recovery tank weight.**
- DANGER:** **EXPLOSION RISK!** This unit is not certified as 'explosion proof' for explosive rated environments. It is only to be used in normal environments.
- DANGER:** **ELECTRICAL SHOCK HAZARD:** Always disconnect power source when servicing this equipment.
- WARNING:** Do not use equipment in the vicinity of spilled or open containers of gasoline or other flammable substances.
- WARNING:** All hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.
- WARNING:** **TO REDUCE RISK OF FIRE:** Avoid use of an extension cord because extension cord may overheat. If you must use an extension cord, use 10 awg minimum.
- WARNING:** Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation. Exposure may irritate eyes, nose, throat and skin. Please read manufacturer's Material Safety Data Sheet for further safety information on refrigerants and lubricants.
- WARNING:** Make certain all safety devices are functioning properly before operating equipment.
- CAUTION:** To avoid cross contamination of refrigerant and potential leakage to the atmosphere, proper hoses and fittings should be used and checked for damage.
- CAUTION:** To avoid overfilling refrigerant tank, read and follow manufacturer's recommended filling instructions for refrigerant being recovered.
- CAUTION:** This equipment is intended for use of one refrigerant at a time. Mixing of different refrigerants will cause your recovered supply of refrigerant to become contaminated.
- Note: It is very expensive to destroy mixed or damaged refrigerants.



SPECIFICATIONS

Model #		TR21	TR21C	TR21J	TR21S	TR21E
Voltage (Hz)		115 V 60 Hz		100 V 50/60 Hz 1PH	220-240V 50 Hz 1PH	
Motor Size (Horsepower)		1				
Motor Thermally Protected		Yes				
Compressor Type		2 Cylinder Oil-less Reciprocating Compressor				
Overload Protection		NA			10 Amp	
Power Consumption		1000 W				
Tank Overfill Switch		Optional	Optional	Standard	Optional	No
High Pressure Shut-Off		550 psig Auto Reset	450 psig Auto Reset	3.8MPa Auto Reset	550 psig Auto Reset	525 psig (38 bar) Manual Reset
Refrigerants	ARI740 Class III	R-12, R-134a, R-401C, R-406A, R-500, R-1234yf/ze				R-12, R-134a, R-401C, R-500
	ARI740 Class IV	R-22, R-401A/B, R-402B, R-407C/D/E/F, R408A, R-409A, R-411A/B, R-412A, R-502, R-509A				R-22, R-401A/B, R-402B, R-407C/ D/E/F, R408A, R-502, R-509A
	ARI740 Class V	R-32, R-402A, R-404A, R-407A/B, R-410A/B, R-507A				R-402A, R-404A, R-410A/B, R-507A
Operating Temperature Range		32°F to 120°F (0°C to 49°C)				
Power Cord Length		6 Ft.				
Dimensions		6" x 12" x 9" (15cm x 30cm x 23cm)				
Weight		24.3 lbs (11.0 kg)				
Approvals		*UL, CE, CSA, TUV				
Warranty (Years)		1				

*Verified UL Flow Rate @ 60Hz (Reduce 15% for all 50Hz models)

Refrigerant	Direct Vapor	Direct Liquid	Push - Pull Liquid	High Temp Vapor Rate
R410a	.70 lb/min (0.32 kg/min)	11.94 lb/min (5.41 kg/min)	31.7 lb/min (14.3 kg/min)	n/a
R22	.59 lb/min (0.27 kg/min)	8.86 lb/min (4.02 kg/min)	31.52 lb/min (14.3 kg/min)	0.39 lb/min (17 kg/min)
R134a	.49 lb/min (0.22 kg/min)	7.8 lb/min (3.54 kg/min)	25.66 lb/min (11.64 kg/min)	n/a
R407c	.53 lb/min (0.24 kg/min)	9.50 lb/min (4.31 kg/min)	29.14 lb/min (13.22 kg/min)	n/a

*Evaluated for performance in accordance with Sec. 608 of the Clean Air Act (Feb 29, 1996) using AHRI-740-98 test methods.

TR21 SERIES UNIT LAYOUT



DIRECT VAPOR OR LIQUID RECOVERY

The following is recommended to maximize recovery rates;

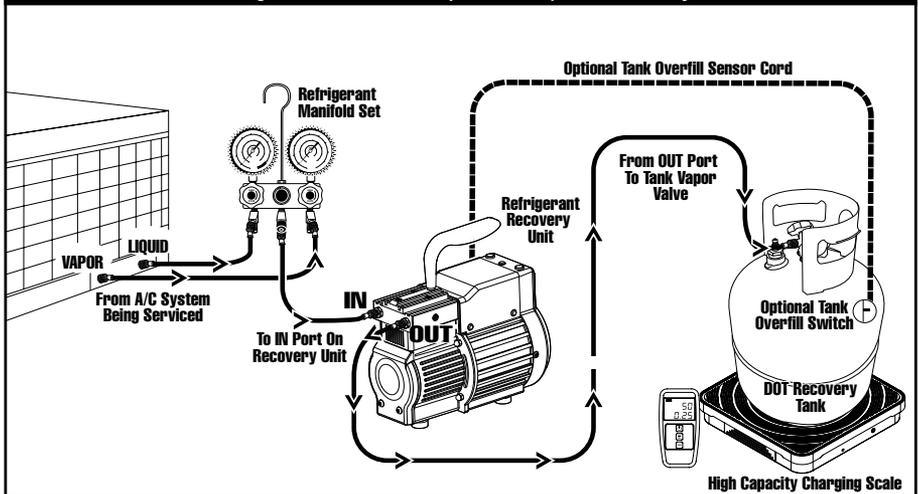
- A. Use shortest length 3/8" (Inside Diameter) Refrigeration Hose on Suction Side of Recovery Unit.
- B. If refrigerant is clean, remove all suction side filters, screens, etc.
- C. Remove all Schrader type valve cores and any valve depressors from hoses and service valves.
- D. If Recovery Unit trips OFF on HIGH Pressure, change recovery cylinder.
- E. When recovering large amounts of R410A, or if recovering under very high ambient temperatures, we suggest using the CPS MT69 (Molecular Transformator) which will increase the recovery speed.

1. Connect the unit as shown in **Diagram 1**. The technician will need to use a refrigerant manifold and one spare hose. The manifold should be connected between the unit being serviced and the TR21 **IN** port. The spare hose should connect from the TR21 **OUT** port to an evacuated DOT recovery tank vapor valve. **Note: The recovery tank must be rated for (38 bar) 550 PSI.**
2. Open the vapor valve on the DOT recovery tank.
3. Keep the manifold valves closed at this time.
4. Push the main power switch "ON".
5. Once unit has started, open both **HI & LO** manifold valves to start the refrigerant recovery flow.

Note: The TR21 is designed to directly recover large amounts of liquid refrigerant. If during vapor recovery process the compressor begins to make a slugging or hammering noise, meter the incoming liquid refrigerant by closing the low side manifold valve until the noise subsides.

6. The TR21 will run continuously. When a 10" hg. vacuum is observed on the low side manifold gauge, close both the **LO & HI** side manifold valves off.
7. If the pressure on the HI side manifold gauge starts to rise, repeat steps 4-7. If HI side manifold gauge remains in a vacuum, close all tank, manifold and hose valves. Re move discharge hose from TR21 outlet port. **Recovery and Self-Clearing are now complete.**

Diagram 1 - Direct Vapor Or Liquid Recovery



HIGH SPEED DIRECT LIQUID RECOVERY

The following is recommended to maximize recovery rates;

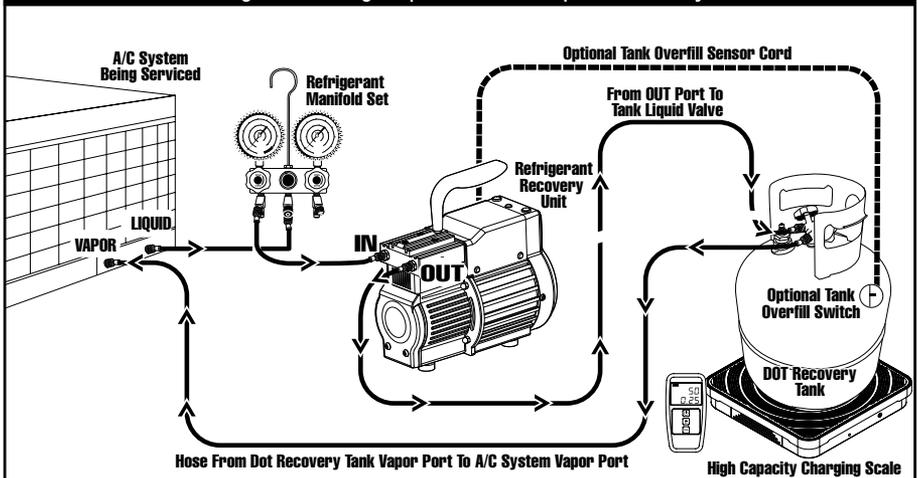
- A. Use the shortest length of 1/4" ID Refrigeration hose on the suction side and discharge side of the unit.
- B. If the refrigerant is clean, remove all suction side filters, screens, etc...
- C. Remove all Schrader type valve cores and any valve depressors from the hoses and service valves.
- D. Use an evacuated DOT tank.
- E. Install a hose between the DOT recovery tank and vapor service valve on the A/C system being serviced. (See Diagram 2)
- F. Use 90lb DOT recovery tank or larger to minimize tank change over.

1. Connect the unit as shown in **Diagram 2**. The technician will need to use a refrigerant manifold (with sight glass) and two spare hoses. The manifold should be connected between the unit being serviced and the TR21 **IN** port. Connect a refrigerant hose from the TR21 **OUT** port to an evacuated DOT recovery tank liquid valve. Connect another refrigerant hose from the DOT tank vapor port to a service port of the unit being serviced. **Note: The recovery tank must be rated for (38 bar) 550 PSI.**
2. Open both the vapor and liquid valves on the DOT recovery tank.
3. Keep the manifold valves closed at this time.
4. Push the main power switch "ON".
5. Once unit has started, open the **LO** manifold valve on the manifold to start the liquid refrigerant flow to the TR21. Monitor the liquid refrigerant flow in the manifold sight glass.

Note: The TR21 is designed to directly recover large amounts of liquid refrigerant. If during vapor recovery process the compressor begins to make a slugging or hammering noise, meter the incoming liquid refrigerant by closing the low side manifold valve until the noise subsides.

6. Once liquid refrigerant is no longer present in the manifold sight glass, close the DOT recovery tank vapor valve. This will transition the unit into direct vapor recovery.
7. Allow the TR21 to run continuously. When a 10" hg. vacuum is observed on the low side manifold gauge, close both the **LO** & **HI** side manifold valves off.
8. If the pressure on the **LO** side manifold gauge starts to rise, open **LO** side manifold valve and restart the TR21. If the LO side manifold gauge remains in a vacuum, close all tank, manifold and hose valves. Remove discharge hose from TR21 outlet port. **Recovery and Self-Clearing are now complete.**

Diagram 2 - High Speed Direct Liquid Recovery



PUSH-PULL LIQUID RECOVERY

The following is recommended to maximize recovery rates;

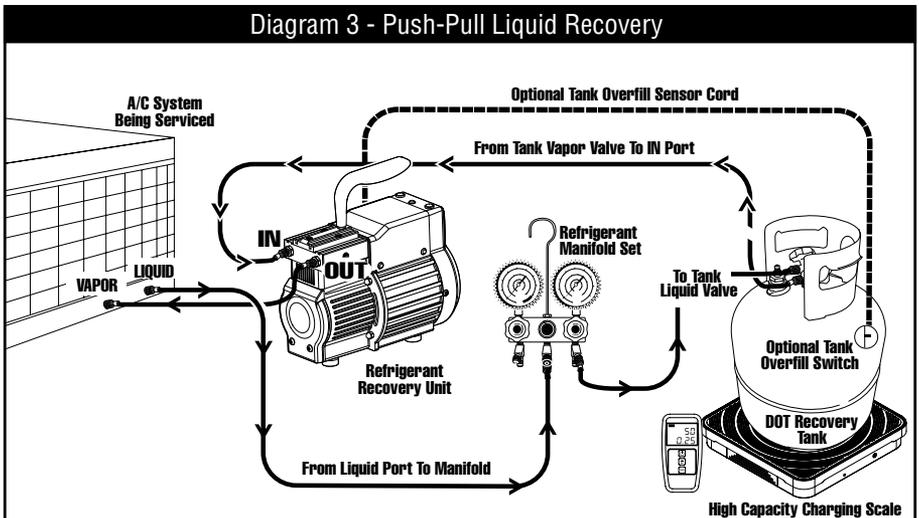
- A. Use shortest length 3/8" (Inside Diameter) Refrigeration Hose on Suction Side of Recovery Unit to Vapor Port on Tank.
- B. Use 3/8" (Inside Diameter) Refrigerant Hoses from system Liquid Service Valve to LIQUID Port on Recovery Tank.
- C. Use an evacuated DOT Tank (90lb or larger, and rated for 550 PSI/38 Bar).
- D. If refrigerant is clean, remove all suction side filters, screens, etc.
- D. Remove all Schrader type valve cores and any valve depressors from hoses and service valves.

1. Connect the unit as shown in **Diagram 3**. The technician will need to use a refrigerant manifold with sight glass and two spare hoses. The manifold should be connected between the liquid service port of the system being serviced and the DOT Recovery tank liquid valve. One spare hose should connect from the TR21 **IN** port to the DOT recovery tank vapor valve. The other spare hose should connect from the TR21 **OUT** port to the vapor service port on the system being serviced.

Note: The DOT recovery tank must be rated for (38 bar) 550 PSI.

2. Close the manifold **LO** side valve. Open the manifold **HI** side valve. Open the DOT recovery tank's liquid valve.
3. Push the main power switch "**ON**".
4. Open the DOT recovery tank vapor valve. A Push-Pull flow is now enabled.
5. Monitor the scale for DOT recovery tank capacity.
6. Monitor the sight glass in the manifold for the presence of liquid refrigerant. Once liquid refrigerant is no longer being pushed out of the A/C system being recovered, close the vapor valve on the DOT recovery tank. Let run for 30 seconds, then turn off unit.

Note: The Push-Pull recovery does not completely recover all the refrigerant. It will be necessary to proceed to Direct Vapor Recovery Operation (page 6) to complete the recovery process.



ROUTINE MAINTENANCE

Filter Maintenance: The TR21 is equipped with a 100-mesh screen filter. This filter should be checked periodically. A partially clogged filter will slow recovery rate.

Check filter cartridge as follows:

1. Use a 5/8" socket or boxed end wrench to remove **IN** port as shown in **Figure 1**.
2. Remove suction port-filter cartridge as shown in **Figure 2**.
3. Clean cartridge or replace with new cartridge. (CPS #CRXF3)
4. Inspect O-ring. Re-lubricate with compressor oil or equivalent.
5. Place filter cartridge back into suction port fitting.
6. Hand tighten this assembly back onto TR21.
7. Use 5/8" socket or boxed end wrench to tighten 1/8 of a turn. Do not over tighten; O-ring damage may occur.
8. Check connection for leaks.

Piston Seal Maintenance: In cases of virgin refrigerant recovery, it is recommended to add .25 ounce of refrigerant oil to inlet port before each use.

Figure 1

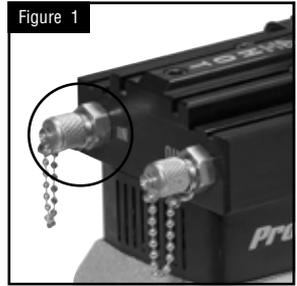
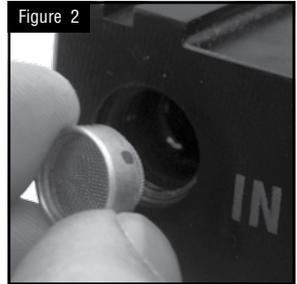


Figure 2



WARRANTY

CPS® Products, Inc. guarantees that all products are free of manufacturing and material defects to the original owner for one year from date of purchase. If equipment should fail during guarantee period it will be repaired or replaced (at our option) at no charge. This guarantee does not apply to equipment that has been altered, misused or solely in need of field service maintenance. All repaired equipment will carry an independent 90 day warranty. This repair policy does not include equipment that is determined to be beyond economical repair.

WARRANTY DISCLAIMER: Use this device to recover only HVAC/R refrigerants from sealed HVAC/R systems. **WARRANTY VOIDED IF USED FOR ANY OTHER PURPOSE.**

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