

# ***Pro-Set***® **cps**®

## **IGNITION PROOF VACUUM PUMP SERIES** **Two Stage Vacuum Pumps**



### **OWNER'S MANUAL (English)**

Français, Español, Deutsch and latest updates: [www.cpsproducts.com](http://www.cpsproducts.com)

**VPS Series: 2, 4, 6, 8, 10 and 12 CFM Two Stage**

TO BE OPERATED BY QUALIFIED PERSONNEL ONLY

**WARNING:** THIS UNIT IS NOT RATED FOR USE IN EXPLOSIVE ENVIROMENTS.  
IT IS DESIGN TO RECOVER CLASS A1, A2 AND A3 REFRIGERANTS IN  
NORMAL OR STANDARD ENVIROMENTS.



Evaluated for performance in  
accordance with Sec. 608 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.

## KEY FEATURES

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- Designed and tested to meet ANSI 12:12.01 Ignition Proof standards
- For use on refrigeration systems utilizing Class A1 (nontoxic, nonflammable), Class A2L (nontoxic, low flammability), Class A2 (nontoxic, flammable), and Class A3 (nontoxic, flammable) and Ammonia (NH<sub>3</sub>)
- Air cooled, thermally protected motors encased in a durable aluminum housing
- Oil filled rotary vacuum pump cartridge construction
- Combination oil fill/exhaust port utilizes CPS exclusive oil mist free exhaust cap
- Large double sealed oil sight glass
- Steel inlet port with multiple intake sizes (1/4, 3/8 & 1/2 SAE), Ammonia compatible
- Ignition proof ON-OFF switch
- Sealed solid state starting system
- Rubber lined handle, skid resistant rubber base
- Gas ballast valve for deeper vacuum

## GENERAL SAFETY INSTRUCTIONS

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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.

## GENERAL SAFETY INSTRUCTIONS

### ADDITIONAL SAFETY INSTRUCTIONS FOR REFRIGERATION SYSTEMS CONTAINING CLASS A2, A2L & A3 REFRIGERANTS

**The following are additional safety recommendations when servicing refrigeration equipment that contain Class A2L, A2 or A3 refrigerants. These instructions do not replace existing occupational hazard procedures or other regulations that may be required by local, state or federal agencies.**

Technicians working on Class A2L, A2 and A3 systems should have detailed knowledge of and skills in handling flammable refrigerants, personal protective equipment, refrigerant leakage prevention, handling of cylinders, charging, leak detection and proper disposal. Additional knowledge of legislation, regulations and standards relating to flammable refrigerants may also be required. **Special Certification or licensing may be required on Class A2L, A2, and A3 and refrigerant handling. Check your local occupational safety codes.**

The area of service should be marked as **Temporary Flammable Zone**. This will be 3 meter perimeter around the refrigeration equipment being serviced and should have NO SMOKING and other hazardous signs posted. Local supervisor should be notified of the zone's existence.

- A flammable gas detector should be used to monitor air in the **Temporary Flammable Zone**
- A dry powder or CO2 fire extinguisher must be available at service location
- Vacuum pump exhaust may contain harmful vapors. Provide adequate ventilation
- A suitable ventilation fan should be used to maintain in the work space at a minimum of 5 air changeovers per hour
- Ensure the refrigeration equipment's power has been discontinued
- All potential ignition sources within temporary flammable zone must be disabled
- When connecting service equipment (such as vacuum pumps, scales, recovery units) to a power source, the connection must be made outside the **Temporary Hazardous Zone**
- Check the system to ensure the refrigerant has been properly removed from the refrigeration system being serviced
- Before evacuating a Class A2 or A3 system, the system should be purged with 100% Nitrogen. **DO NOT USE AIR**

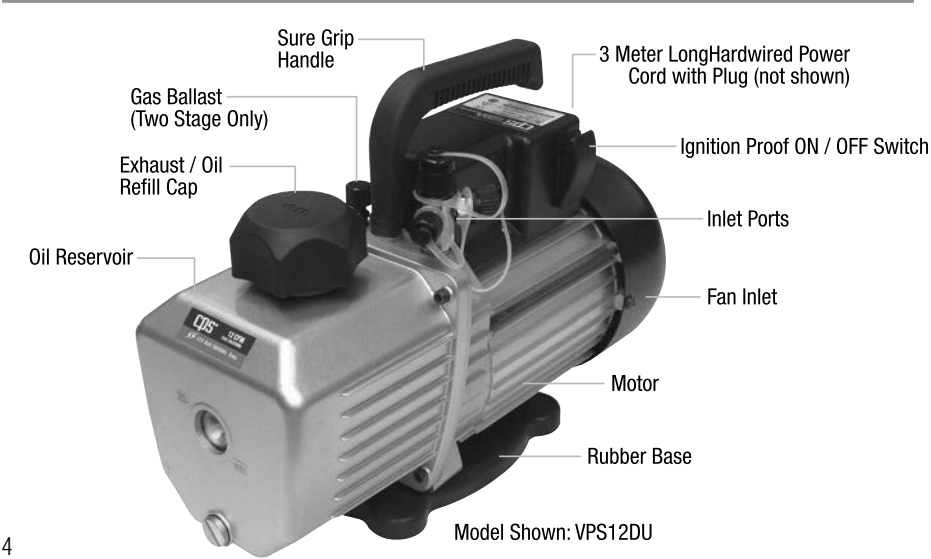


**DANGER-EXPLOSION RISK:** Do not mix Class A2L, A2 or A3 refrigerants with air. All precautions must be taken to eliminate mixing of air with flammable refrigerants, including monitoring Recovery Cylinder for air content.

# SPECIFICATIONS

Models	VPS2D*	VPS4D*	VPS6D*	VPS8D*	VPS10D*	VPS12D*
Stage	2					
Ultimate Vacuum	10 Microns			25 Microns		
Refrigerant Classes	<b>A1</b> Non-toxic, Non-flammable		<b>A2</b> Non-toxic, Low-flammability		<b>A3</b> Non-toxic, High-flammability	
Dimensions (inches)	12.2 x 5 x 9.6	13.1 x 5.5 x 10		14.9 x 5.7 x 10.6		
Weight	17.7 lb / 8.0 kg	22.1 lb / 10.0 kg	22.5 lb / 10.2kg	29.8 lb / 13.5kg	30.3 lb / 13.7kg	30.9 lb / 14.0kg
Free Air Displacement	2 CFM @ 60Hz 48 l/m @ 50Hz	4 CFM @ 60Hz 96 l/m @ 50Hz	6 CFM @ 60Hz 144 l/m @ 50Hz	8 CFM @ 60Hz 192 l/m @ 50Hz	10 CFM @ 60Hz 240 l/m @ 50Hz	12 CFM @ 60Hz 288 l/m @ 50Hz
Motor Size (HP) RPM @ 50/60 Hz	1/3 1440/1720	1/2 2880/3440	1/2 2880/3440	2/3 2880/3440	3/4 2880/3440	1 2880/3440
Oil Capacity	11.5 oz / 330ml	15.5 oz / 450ml	14 oz / 400 ml	29 oz/ 860 ml	28 oz / 830 ml	27 oz / 800 ml
Voltage*	<b>U</b> =115V 60Hz, <b>A</b> =220-240V 50Hz, <b>E</b> =220-240V 50Hz, <b>K</b> =230V 60Hz/220V 50Hz					
Power Cord Connection to Pump	Hard Wired 3 Meter Power Cord <b>1.</b> NEMA 5-15P Plug on 115V 60Hz <b>2.</b> Australia Plug on 220-240V 50Hz "A" Suffix <b>3.</b> SCHUKO Plug on 220-240V 50Hz "E" and "K" Suffix					
Power Switch	Ignition Proof ON-OFF Switch					
Operating Temperature Range	32°F to 125°F (0°C to 52°C)					
Gas Ballast Valve	Yes					
Intake Fittings**	Steel inlet with 1/4" SAE Male, 3/8" SAE Male, and 1/2" SAE Male ports					
Warranty	2 year					
Materials of this vacuum pump are compatible with Ammonia (NH3) refrigerant.						
**V suffix denotes solenoid operated inlet valve with 1/4 SAE & 5/16 or 3/8 SAE (8, 10, 12 CFM models)						

# UNIT LAYOUT



## INITIAL PREPARATION

**IMPORTANT! If recovering Class A2, A2L, or A3 refrigerants, read ADDITIONAL SAFETY INSTRUCTIONS ON PAGE 3 OF THIS MANUAL.**

1. Thoroughly read this manual on the additional safety procedures required when servicing Class A2 and A3 refrigerant systems.
2. The vacuum pump is shipped without oil in the reservoir. Remove the exhaust / oil fill cap and add oil until it is seen in the middle of the oil sight glass. Re-secure cap.
3. Remove the 1/4" inlet service port cap, turn on the vacuum pump. After 15 seconds, replace cap back on inlet port.
4. Re-check vacuum pump oil level. Add or remove oil if necessary.

To achieve good final vacuum levels, the oil level should be visually seen through sight glass.

**CAUTION: DO NOT RUN THIS EQUIPMENT WITH LOW OR NO OIL. RUNNING THIS EQUIPMENT WITH NO LUBRICATION WILL CAUSE PREMATURE FAILURE.**

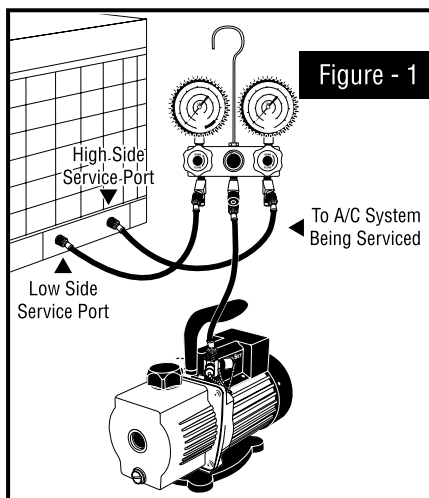
**VACUUM PUMP IS NOW READY FOR USE.**

## VACUUM PUMP OPERATION

**WARNING: Do not operate on systems under pressure.  
Damage to the pump may occur.**

1. Connect the power cord from vacuum pump to a power supply rating to the unit's nameplate (top of electrical box).
2. Check oil level in vacuum pump.
3. Connect vacuum pump as shown in Figure - 1.
4. If pressure is above 2 PSIG, run recovery operation first.
5. Turn **ON** unit and open manifold valves.
6. Run until the desired final vacuum level is reached.
7. Once final vacuum level is reached, close manifold valves and turn power switch **OFF**.

**Vacuum Operation is Complete.**



**GAS BALLAST VALVE OPERATION:** The gas ballast valve helps remove moisture and other condensable vapors that have been drawn into the 2nd stage pump mechanism. Opening the gas ballast valve allows fresh air to enter the 2nd stage mechanism which will reduce the moisture level and allow for deeper final vacuums.

## TROUBLE SHOOTING CHART

Condition	Possible Problem	Solution
Unusually noisy	<ol style="list-style-type: none"> <li>1. Bad bearings.</li> <li>2. Loose motor bolts.</li> <li>3. Coupling drive.</li> <li>4. Dirty, low, or improper oil.</li> <li>5. Air leaks in connections.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace motor.</li> <li>2. Tighten bolts.</li> <li>3. Adjust or replace coupling.</li> <li>4. Replace oil.</li> <li>5. Fix leaks.</li> </ol>
High temperature	<ol style="list-style-type: none"> <li>1. Low or improper voltage.</li> <li>2. Worn bearings.</li> <li>3. Low oil level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power source voltage.</li> <li>2. Replace motor.</li> <li>3. Add or replace.</li> </ol>
Poor vacuum	<ol style="list-style-type: none"> <li>1. System leaks.</li> <li>2. Low oil level.</li> <li>3. Dirty oil.</li> <li>4. Air leaks at connection.</li> <li>5. Air leak through seal.</li> <li>6. Worn rotary mechanism.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fix leaks.</li> <li>2. Add or replace oil.</li> <li>3. Flush and replace oil.</li> <li>4. Fix leaks.</li> <li>5. Replace shaft seal.</li> <li>6. Replace cartridge.</li> </ol>
Oil leaks	<ol style="list-style-type: none"> <li>1. Oil leaks through exhaust.</li> <li>2. Oil leaks through shaft seal.</li> <li>3. Oil leaks through reservoir.</li> <li>4. System vented pressure.</li> <li>5. Pump tipped over.</li> </ol>	<ol style="list-style-type: none"> <li>1. Oil level too high.</li> <li>2. Replace shaft seal.</li> <li>3. Tighten bolts or replace gasket.</li> <li>4. Check oil level.</li> <li>5. Check oil level.</li> </ol>
Pump does not start	<ol style="list-style-type: none"> <li>1. No power to motor.</li> <li>2. Damaged motor.</li> <li>3. Thermal cutout.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check fuses in IEC panel.</li> <li>2. Replace motor.</li> <li>3. Wait for thermal switch to reset. Check for cause of thermal.</li> </ol>
Thermal cutout	<ol style="list-style-type: none"> <li>1. Low or incorrect voltage.</li> <li>2. Cold weather.</li> <li>3. Dirty Oil.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check voltage, move voltage selector switch to correct setting.</li> <li>2. Start and run vacuum pump with the intake fitting open for 1 minute to warm up oil.</li> <li>3. Flush and replace oil.</li> </ol>

## ROUTINE MAINTENANCE

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It is recommended to change the vacuum pump oil after **50 hours** of usage. The purity of the oil will determine the final vacuum level achieved. Always use the CPS recommended vacuum pump oil (**VPOQ / VPOP / VPOG**). The oil provided with the pump has been specially blended to maintain maximum viscosity at normal running temperatures as well as cold weather starts.

### OIL CHANGE PROCEDURES:

1. Be sure the pump oil is warmed up. If not warm, turn vacuum pump **"ON"** for **10 minutes**.
2. Make sure vacuum pump is not plugged in.
3. Remove the oil drain cap and drain the contaminated oil into a suitable container. Tilt the vacuum pump toward the oil drain port.
4. Once all the oil has been drained, re-secure the oil drain cap back onto the oil drain port.
5. Remove the exhaust / oil fill cap and add oil until it is seen in the middle of the oil sight glass. Re-secure exhaust/oil fill cap.

## WARRANTY

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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.**

## LOCATIONS

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