

# cps<sup>®</sup>

## ***Pro-Set*<sup>®</sup> VACUUM PUMP SERIES**

VP & VPC SINGLE - DUAL STAGE VACUUM PUMPS



CE

# OPERATION MANUAL

# GENERAL INFORMATION

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## Introduction

Thank you for purchasing the **CPS® Pro-Set®** VP vacuum pump series. Our vacuum pumps are specifically designed for the air-conditioning and refrigeration service industry. The **VP** and **VPC** series both utilize an electrical motor and oil filled rotary vacuum pump cartridge construction.

### Features:

- Equipped with our exclusive oil mist free exhaust port
- VP series dual stage models are equipped with gas ballast valve
- The dual voltage models can be quickly converted to 115 or 230 volt operation
- **Sure-Grip** handle, ergonomically designed for superior comfort and portability
- Solid rubber base provides extreme shock resistance
- Air cooled motor design allows for operation under high temperature conditions
- The VP & VPC series excel in vacuum performance, rated 10-15 microns (Dual Stage) and 50-100 microns (Single Stage)
- All vacuum pumps allow for multiple connections, therefore giving full operational preference
- Accessible oil drain port & sight glass make both oil maintenance and accuracy easy

To help you get a good start, please continue to carefully read the balance of this manual. This manual contains important information on the proper procedures for operating this equipment. Please pay close attention to the: **Safety Information, Warnings, and Cautions** provided throughout this manual.

**ALWAYS REMEMBER “ SAFETY FIRST ”**

# GENERAL INFORMATION

## General Safety Instructions

**ONLY QUALIFIED SERVICE PERSONNEL SHOULD OPERATE THIS UNIT. SOME COUNTRIES MAY REQUIRE THE USER TO BE LICENSED. PLEASE CHECK WITH YOUR LOCAL GOVERNMENT AGENCY.**

**DANGER** - Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

### **DANGER - ELECTRICAL SHOCK**

**HAZARD** - Always disconnect power source when servicing this equipment.

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

**CAUTION** - 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.

**CAUTION** - Avoid breathing refrigerant vapors and/lubricant mist. Exposure may irritate eyes, nose, throat and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

**CAUTION** - To reduce the risk of fire, avoid the use of extension cords thinner than NO. 14 awg. (2,5mm<sup>2</sup>) to prevent the overheating of this cord please keep length to a minimum.

**CAUTION** - Do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Make certain that all safety devices are functioning property before operating the equipment.

**CAUTION: THIS EQUIPMENT IS INTENDED FOR USE OF FINAL EVACUATION OF A REFRIGERANT SYSTEM. THE EVACUATION OF MATERIALS ABOVE 5 PSIG MAY CONTAMINATE OR DAMAGE THE VACUUM PUMP.**

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



## Specifications

\* "Blank" = Dual voltage (110-120 / 220 50/60Hz E = 220-240V 50/60Hz J = 100V 50/60Hz U = 115V 50/60Hz

Model Number	VPC2S*	VPC4S*	VP2S*	VP4S*	VP6S*
Stages	1		1		
Motor Size (HP) RPM @ 50/60Hz	1/5 2880 / 3440	1/4 2880 / 3440	1/4 1440 / 1720	1/3 2880 / 3440	1/2 2880 / 3440
Dimensions (Inches)	9.1 x 4.5 x 8.0	11.3 x 4.5 x 8.0	12.2 x 5 x 9.6		13.1 x 5.5 x 10
Weight	9.3 lb / 4.2 kg	11.0 lb / 5 kg	13.7 lb / 6.2 kg	15.0 lb / 6.8 kg	18.3 lb / 8.3 kg
Operating Temperature Range	0°C (32°F) to 52°C (125°F)				
Power Source Available*	U, E, J		Dual		
Ultimate Vacuum	as low as 100 Microns		50 Microns		
Oil Capacity	9 oz / 250 ml	10 oz / 300 ml	16 oz / 470 ml	16 oz / 470 ml	19 oz / 550 ml
Construction	Heavy Gauge Aluminum Chassis with hard rubber base and rubber lined steel handle				
Overload Protection	Motor Thermally Protected, Dual Voltage units have extra IEC fuse				
Control System	ON-OFF power switch				
Free Air Displacement	2 CFM @ 60Hz 48 l/m @ 50Hz	4 CFM @ 60Hz 96 l/m @ 50Hz	2 CFM @ 60Hz 48 l/m @ 50Hz	4 CFM @ 60Hz 96 l/m @ 50Hz	6 CFM @ 60Hz 144 l/m @ 50Hz
Intake Fittings	1/4 SAE and 1/2 ACME		1/4 SAE, 3/8 SAE, and 1/2 ACME		
Gas Ballast Valve	No				

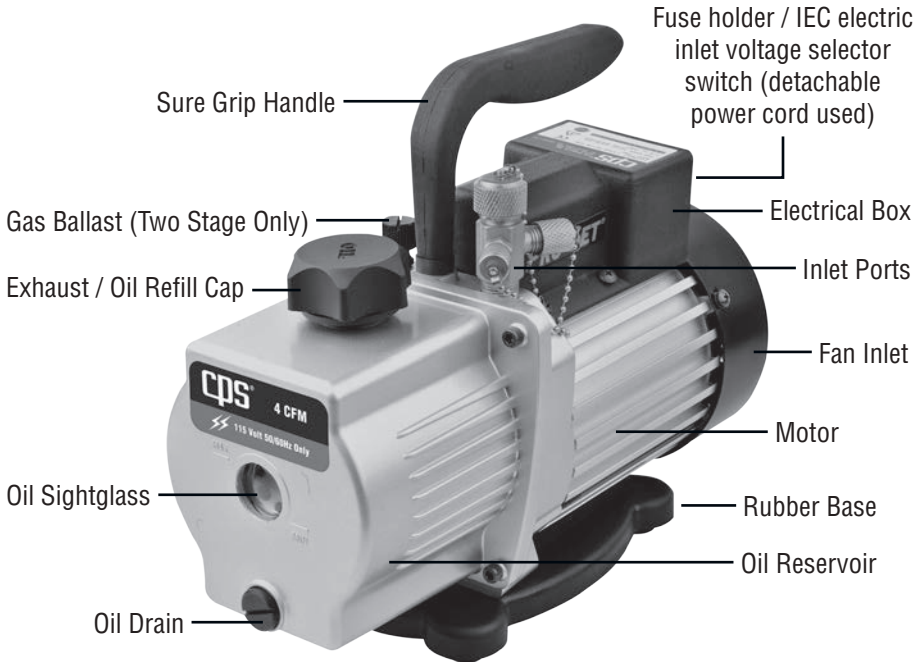
**Specifications**

\* "Blank" = Dual voltage (110-120 / 220 50/60Hz E = 220-240V 50/60Hz J = 100V 50/60Hz U = 115V 50/60Hz

Mode Number	VPC2D*	VP2D*	VP4D*	VP6D*	VP8D*	VP10D*	VP12D*
Stages	2						
Motor Size (HP) RPM @ 50/60Hz	1/4 2880 / 3440	1/3 1440 / 1720	1/2 2880 / 3440	1/2 2880 / 3440	2/3 2880 / 3440	3/4 2880 / 3440	1 2880 / 3440
Dimensions (Inches)	11.3 x 4.5 x 8.0	12.2 x 5 x 9.6	13.1 x 5.5 x 10		14.9 x 5.7 x 10.6		
Weight	12.1 lb / 5.5 kg	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
Operating Temperature Range	0°C (32°F) to 52°C (125°F)						
Power Source Available*	E, U, J	Dual, E, J			Dual, J		
Ultimate Vacuum	15 Microns	10 Microns					
Oil Capacity	9 oz / 250ml	11.5 oz / 330ml	15.5 oz / 450ml	14 oz / 400 ml	29 oz / 860 ml	28 oz / 830 ml	27 oz / 800 ml
Construction	Heavy Gauge Aluminum Chasis with hard rubber base and rubber lined steel handle						
Overload Protection	Motor Thermally Protected, Dual Voltage units have extra IEC fuse						
Control System	ON-OFF power switch						
Free Air Displacement	2 CFM @ 60Hz 48 l/m @ 50Hz	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
Intake Fittings	1/4 SAE & 1/2 ACME	1/4 SAE, 3/8 SAE, and 1/2 ACME			1/4, 3/8 and 1/2 SAE		
Gas Ballast Valve	No	Yes					

# OPERATION

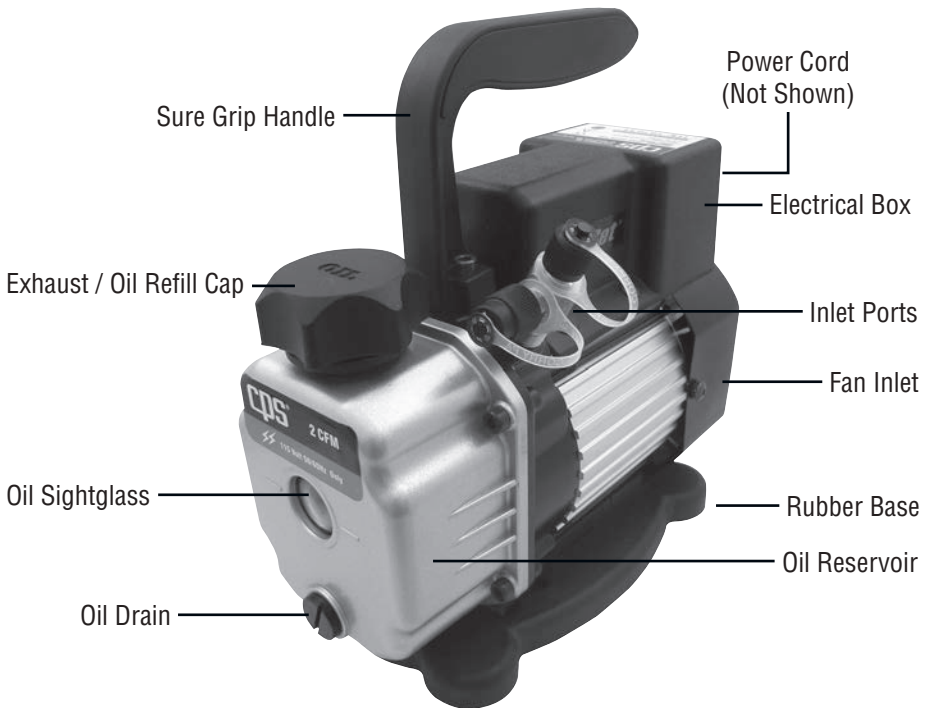
## VP Series Parts



### Unit consists of:

- **Pro-Set**® model vacuum pump
- **CPS**® vacuum pump oil
- Operational manual.

## VPC Series Parts



### Unit consists of:

- **Pro-Set**® model vacuum pump
- **CPS**® vacuum pump oil
- Operational manual.

# OPERATION

## Initial Preparation

1. If the vacuum pump is equipped with a dual voltage motor, make sure the voltage selector switch is set for the desired voltage operation.
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 1/4 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.**

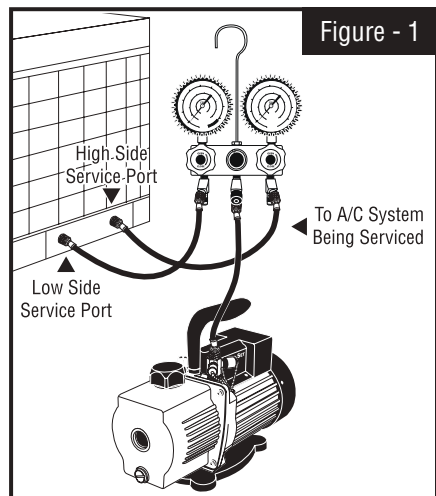
## Vacuum Pump Operation

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

1. Check the correct power supply outlet to be used.
2. The VP series is equipped with a dual voltage motor. Make sure the voltage selector switch is set for the desired voltage operation.

**Caution: The motor will overheat and trip the thermal protector if the voltage selector and the power supply voltage do not match.**

3. Connect the correct power cord from vacuum pump to power supply outlet.
4. Check oil level in vacuum pump.





5. Connect vacuum pump as shown in **Figure - 1**.
6. Open manifold valves.
7. Turn vacuum pump power switch "**ON**".
8. Run vacuum pump until final vacuum level is met.
9. Once the final vacuum level is reached, close manifold valves, turn power switch "**OFF**".

## VACUUM OPERATION COMPLETE

### Routine Maintenance

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.

# OPERATION

## Troubleshooting 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>