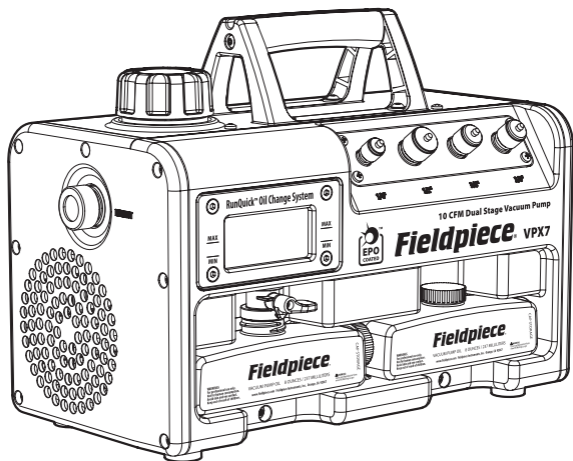


Fieldpiece®

Vacuum Pump with RunQuick™ Oil Change System

OPERATOR'S MANUAL

Models VPX7, VP87, VP67,
VPX7UK, VP87UK



Contents

- Important Notice** 4
- Warnings** 4
- What's Included**. 5
- Certifications** 5
- Description** 6
 - Features
- Specifications** 8
- Safety Information.** 9
 - General
 - Environmental
 - Personal Protection
 - Vacuum Pump Protection
 - Setup
 - Grounding Instructions
- Tech Tips** 12
 - General
 - Cold Weather Starts
 - Setup

- Operation.** 14
 - RunQuick™ Oil Change System
 - Evacuation with a 4 Port Manifold
 - Evacuation with a 3 Port Manifold
 - Direct Evacuation
 - Oil Change Procedure
 - Dynamic Vacuum Measurement
 - Remote Exhaust
 - Gas Ballast Valve Switch
 - LED Indicators
- Maintenance.** 28
 - General
 - Storage
 - Vacuum Isolation Test
 - Oil Window Cleaning
- Troubleshooting** 30
- Limited Warranty** 32
 - Obtaining Service

Important Notice

This is not a consumer machine. Only qualified personnel trained in service and installation of A/C and/or refrigeration equipment shall use this vacuum pump.

This vacuum pump is used for evacuating (drying) refrigerant lines. Fieldpiece model MR45 is available for recovering refrigerant.

Read and understand this operator's manual in its entirety before using to prevent injury or damage to you or equipment.

WARNINGS

Ensure proper equipment grounding, electrical shock risk.
Do not expose to rain, electrical shock risk. Store indoors.
Do not connect or disconnect when energized, explosion risk.
Do not use to pump liquid refrigerant, explosion risk.
Do not use to pump flammable media, explosion risk.
Inhalation of high concentrations of refrigerant vapor can block oxygen to the brain causing injury or death.
Exposure to refrigerant can cause frostbite.
Oil from the vacuum pump can be hot. Handle with caution.
This machine should only be used for evacuation of refrigerant systems after refrigerant has been removed from the system and the system has been opened to atmosphere. This machine is not to be used as a transfer pump for liquids or any other media; doing so can damage the product.

What's Included

- VP67/VP87/VPX7 Vacuum Pump
- IEC Power Cord
- (2) 8 Ounce Vacuum Pump Oil
- Operator's Manual
- 1 Year Warranty

Certifications



WEEE

Do not dispose through typical waste streams.



UL 1450, CSA 68

UL 121201, CSA 213



CE (VP87/VPX7)



UKCA (UK models)

Description

Performing a proper system evacuation prior to charging directly increases the expected life and efficiency of the system. Fieldpiece vacuum pumps provide a new view at system evacuation.

Good oil is the lifeblood of every evacuation. You need to know the condition of the oil. You need to change the oil easily with no mess. Clearly view the oil condition through the huge oil tank window. The oil backlight helps to see the condition of the oil and if the fill level is correct.

With the RunQuick™ oil change system, you can replace the oil in under 20 seconds without losing vacuum, even while the pump is running. The extra wide base helps prevent tipping and spilling oil. Four inline ports in three different sizes give you tidy hose routing and hose options. Place the power cord on the handle for tangle free storage. Carry the machine to and from the job site easily and well protected.

Features

- **10CFM (VPX7), 8CFM (VP87), 6CFM (VP67)**
- **A2L Ready Safety Certified**
- **RunQuick™ Oil Change System**
 - Easy View Window and Oil Backlight
 - Change Oil Quickly, Even with the Pump Running
 - Extra Oil Bottle Storage
 - Elevated Oil Drain Ball Valve
 - Wide Mouth Fill Port
 - Oil Bottle Cap Storage
 - Precision Oil Circulator
- **4 Inline Ports**
 - (1) 1/4"
 - (2) 3/8"
 - (1) 1/2"
- **Two Stage Pump**
- **Gas Ballast Switch**
- **Oil Window LED Indicators**
- **Remote Exhaust Port**
- **Quiet Fan-Cooled Operation**
- **DC Motor (VPX7,VP87)**
- **Operation Down to 95VAC (VPX7,VP87)**
- **Cord Storage Integrated into Rubber Handle**
- **IEC Power Cord and Lock**
- **EPO Coated Aluminum Pump (VPX7)**
 - Super Lightweight
 - Enhanced Durability

Specifications

Flow Rate: 10CFM (VPX7), 8CFM (VP87), 6CFM (VP67)

Oil Capacity: 8oz (237mL)

Oil Compatibility: Fieldpiece Vacuum Pump Oil

(Highly refined and optimized for proper sealing and lubrication)

Fieldpiece part numbers: OIL8X3, OIL32, OIL128

Oil Backlight: Blue LED

Oil Drain: Ball valve

Port Sizes: (1) 1/4", (2) 3/8", (1) 1/2"

Compressor: Rotary vane, two stage

Motor: 3/4 HP Brushless DC (VPX7/VP87), 1/2 HP AC (VP67)

RPM: 2500 (VPX7/VP87), 3440 (VP67)

Power Source: 120 VAC @ 50/60 Hz 1 phase

Nominal Current Draw: 6 AAC (VPX7/VP87), 5 AAC (VP67)

Ultimate Vacuum at Input Ports: 15 microns

Dimensions: 7.9 inch x 11.7 inch x 16.0 inch

(201 mm x 296 mm x 406 mm)

Weight Empty: 24 lb / 10.9 kg (VPX7), 27 lb / 12.3 kg (VP87),

29 lb / 13.2 kg (VP67)

Operating Environment: 30°F to 122°F (-1.1°C to 50°C)

Hazardous Location: Class I, Division 2, Group D, T4

US Patent: www.fieldpiece.com/patents

Safety Information

General

1. This machine is only intended for use by qualified personnel trained in servicing and installation of A/C/Refrigeration equipment.
2. Read and understand this operator's manual in its entirety before using to prevent injury or damage to you or equipment.
3. Always dispose of oil according to local jurisdiction.

Environmental

1. Use only within operating environment specification.
2. Ensure fan opening is clear of debris.
3. Explosion and fire risks:
Do not use near sewer lines.
Do not use in poorly ventilated enclosed areas.
Do not use near gasoline, acetylene, or other flammable gases.
Do not use to pump hydrocarbons.
Do not use near flames or sparks.
Assume all components are pressurized.

Personal Protection

1. Frostbite danger. Be careful using hoses.
2. Use personal protective equipment:
Wear safety goggles.
Wear earplugs if using for long durations.
Wear protective gloves.
3. Oil from the vacuum pump can be hot.
Use caution while handling.
4. Do not use in poorly ventilated enclosed areas.

Vacuum Pump Protection

1. Ensure clean oil is added to a level between MIN and MAX lines.
2. Do not use to remove refrigerant from a system. Use a recovery machine and filter to remove refrigerant and particles from the system before using VPX7/VP87/VP67 to evacuate the system.
3. Do not use on pressurized systems. Doing so may damage or contaminate your vacuum pump.
4. Do not use on ammonia or salt water systems. Doing so may damage or contaminate your vacuum pump.
5. Store with ports capped to prevent dust from entering.
6. Drain oil after every job and store VPX7/VP87/VP67 empty to prevent spillage and reduced oil life.

Setup

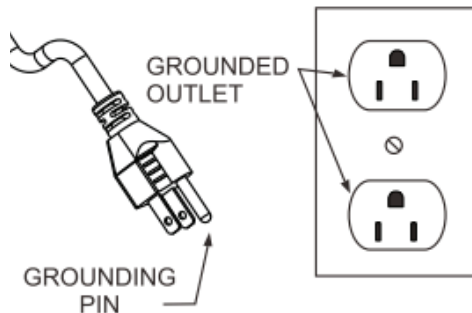
1. Inspect the machine and repair any damaged parts before using.
2. Ensure motor power is switched OFF (left) before connecting or disconnecting power.
3. Ensure power cord is not damaged.
4. Ensure all equipment is grounded.
5. Extension cord options:
14 AWG or thicker, up to 50 feet (15 m)
DO NOT USE 18 AWG!
NOTICE: Risk of Property Damage. The use of an undersized extension cord will cause voltage to drop resulting in power loss to the motor and overheating.
6. Ensure extension cord is grounded, 3 conductor, and is not damaged.

Grounding Instructions

This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING – Improper installation of the grounding plug is able to result in a risk of electric shock. When repair or replacement of the cord or plug is required, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.

Check with a qualified electrician or serviceman when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.



Tech Tips

General

1. Vacuum pumps are not refrigerant recovery machines and should not be used for recovering refrigerant.
2. Purge the A/C system with a few psi of dry nitrogen before evacuation to pre-dry the system. This extra step actually saves time overall because it quickly removes a great amount of moisture, oil, and other contaminants before you even connect your pump.
3. Performing a triple evacuation is a great way to ensure a system is dry. The nitrogen flow can help carry moisture with it out of the system. A triple evacuation is as follows:
 1. Purge with nitrogen
 2. Evacuate down to 2000 microns
 3. Purge with nitrogen
 4. Evacuate down to 1000 microns
 5. Purge with nitrogen
 6. Evacuate down to below 500 microns

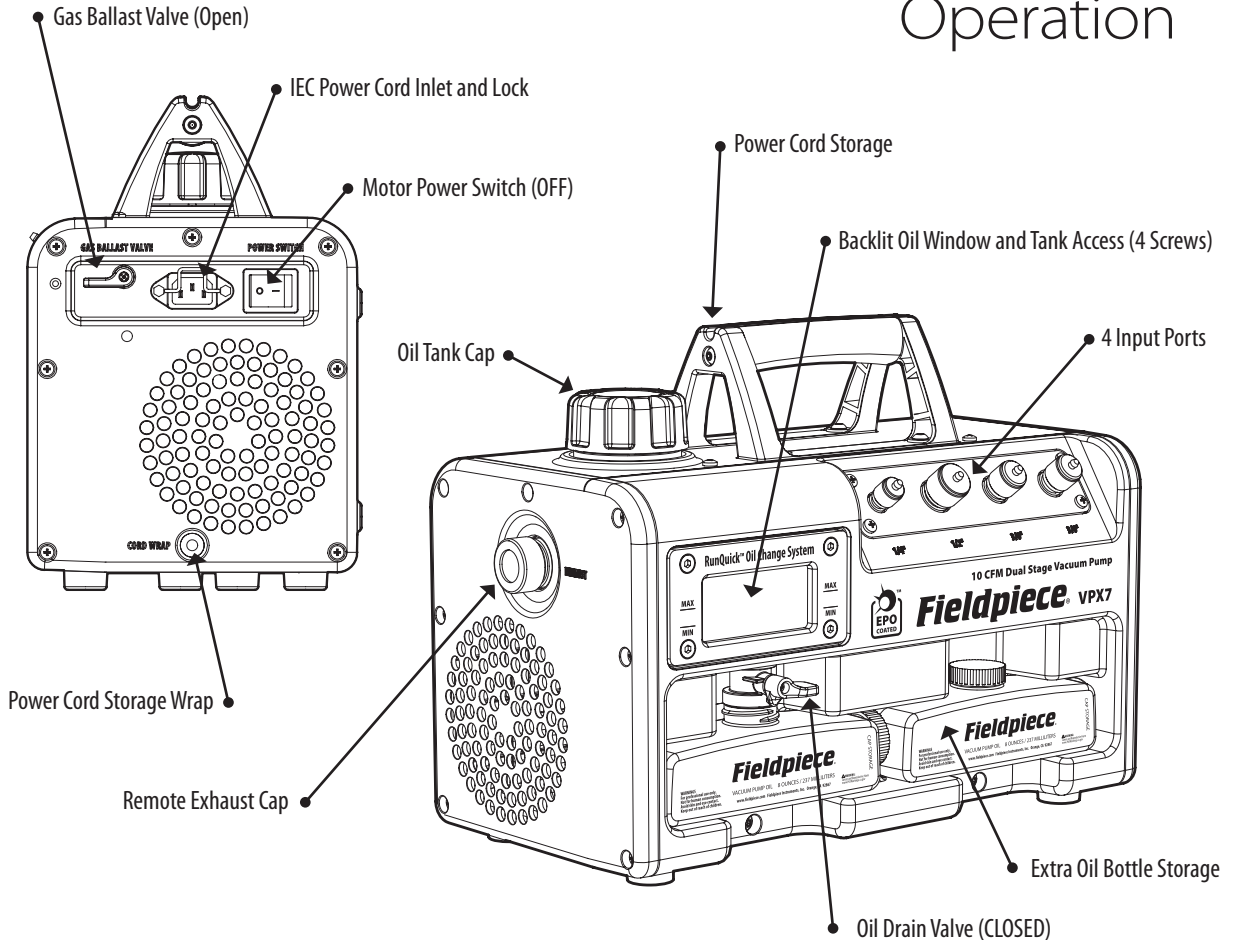
Cold Weather Starts

1. Open an unused input port to ambient for a few seconds until the pump is running.
2. Warm the pump in your truck/home by letting it sit in a warm environment. You can warm the oil in your truck/home before adding it to the pump.

Setup

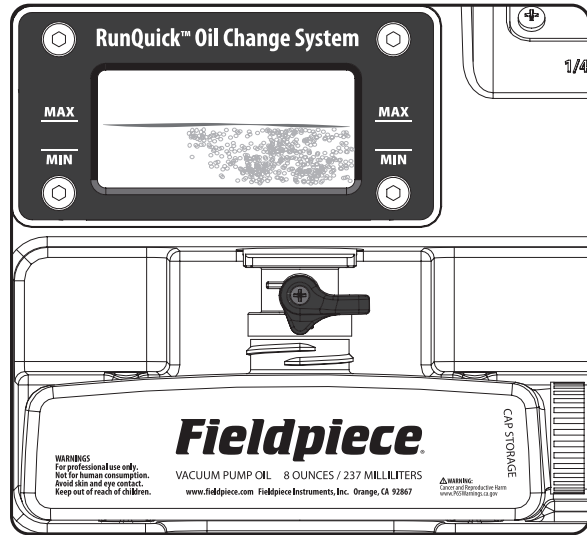
1. Always use fresh Fieldpiece vacuum pump oil. If oil is left in the pump for more than a week, the oil may have absorbed enough moisture from ambient air to affect performance.
2. Refrigerant manifolds can be convenient to charge the system after evacuation, but their hoses and valves can limit or slow evacuation. It's best to use vacuum rated hoses, directly connected to core removal tools at the service ports.
3. If you want to use a manifold, it's best to use a 4 port manifold. 4 port manifolds typically have a larger bore to increase flow. They also isolate the pump from the system and micron gauge without the need of a shut-off valve on the hose.
4. Hoses:
 - Short as possible.
 - Widest diameter as possible.
 - Vacuum rated.
 - Core depressors removed.
 - Ball valve shut-offs instead of low loss fittings.
 - Good seals.
 - Replace if worn.
5. Use a vacuum rated Schrader valve core removal tool to temporarily remove valve cores from service ports.
6. Connect multiple hoses to the inline ports on VPX7/VP87/VP67 to further decrease hose restriction and increase air flow.

Operation



RunQuick™ Oil Change System

The only way to create a deep vacuum is to evacuate with fresh oil, especially at the end of the job. The RunQuick oil change system makes this old chore a breeze.



Easy View Window and Oil Backlight

There are a few signs that remind you to change your oil. The visual condition is one of them. If it looks old, change it. You will see tiny air bubbles with fresh oil. Saturated oil will look more opaque.

Elevated Oil Drain Ball Valve

By elevating the oil reservoir and utilizing a fast opening ball valve, we made it easy to drain old oil into the empty bottle without a drop spilled.

Oil Bottle Cap Storage

When you open a fresh bottle of oil, put the cap on the side of the bottle so you can cap the bottle after you drain old oil into it.

Wide Mouth Fill Port

It is easy to hit your target with the wide mouth fill port.

Change Oil Quickly with the Pump Running

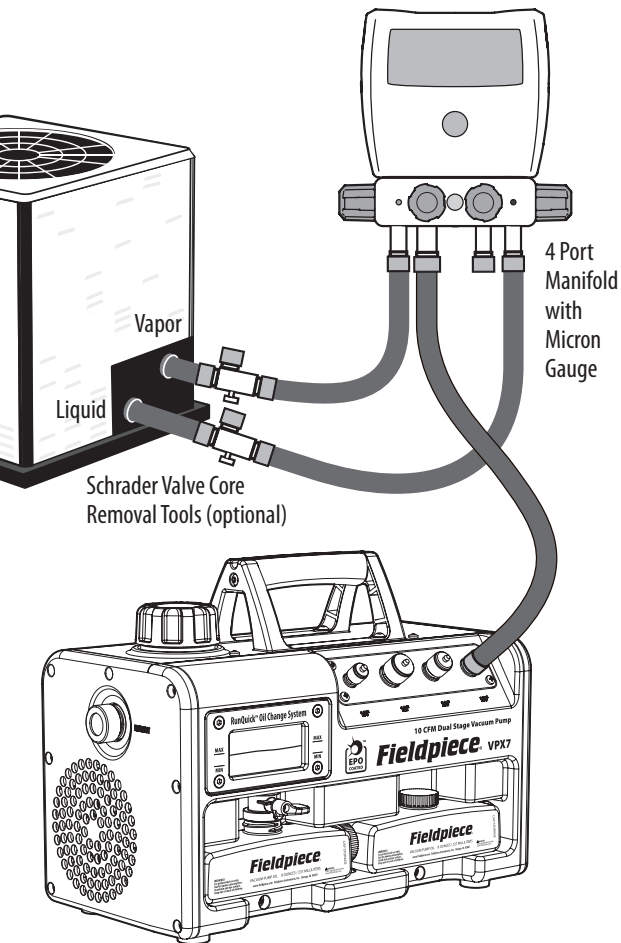
Towards the end of the evacuation is when you need fresh oil the most. The RunQuick system maintains a vacuum for about 30 seconds after you drain the oil so you can drain and pump without any loss of vacuum.

Precision Oil Circulator and Fan

Instead of submerging the pump in excess oil, a small oil pump constantly lubricates targeted sealing zones. The quiet high speed fan cools the heat sinks of the motor and pump.

Spare Oil Bottle Storage

Take an extra bottle to and from the job site so you always have that fresh oil performance bump at the end of the job.



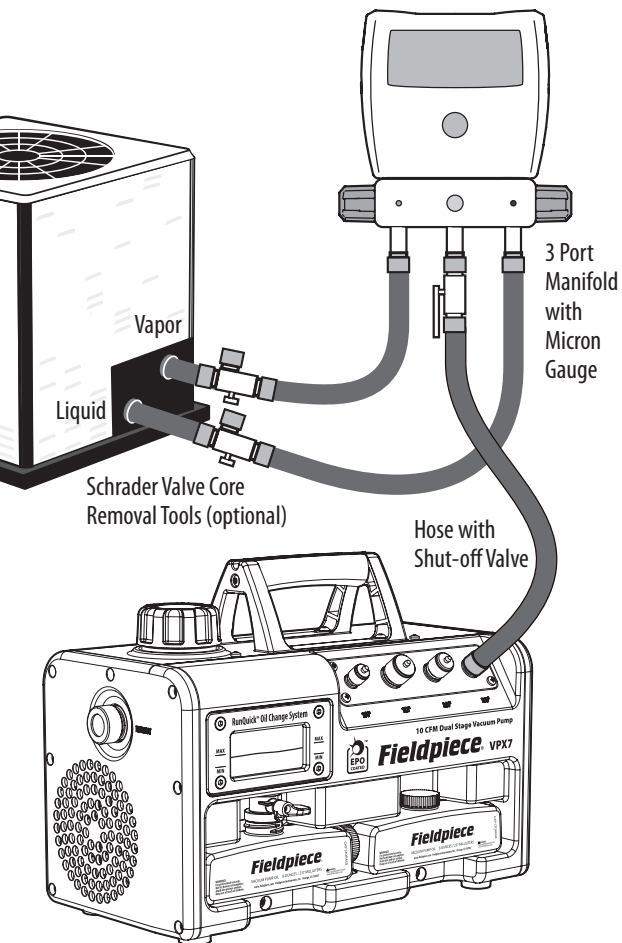
Evacuation with a 4 Port Manifold

This is the most common evacuation method. Read the tech tips (page 12) for optimum gauge placement and variations to reduce recovery times.

1. Always fill with fresh Fieldpiece Vacuum Pump Oil (page 24). *Running the pump without oil will damage the pump and void the warranty. Oil can be drained while the pump is running if refilled within 3 minutes (within 30 seconds to maintain your vacuum).*
2. Ensure the motor power switch is turned OFF (left).
3. Plug into an outlet (oil backlight should illuminate).
4. Ensure the gas ballast is closed (vertical) (page 26).
5. Connect to the empty, depressurized A/C system.
6. Turn the motor power switch to ON (right).
7. Open line set (hoses, manifolds, removal tools, etc.) to expose the pump to the system. *To reduce oil contamination early in the job, open the gas ballast until the sound of the pump quiets down (about 3000 microns). The yellow LED in the oil window shines if the ballast is open.*
8. After the appropriate vacuum is reached, isolate the system from the pump. You can check the system for potential leaks at this time by monitoring your micron gauge. *Your vacuum pump has a unique oil suck back prevention feature to keep your hoses clear of oil. Still, it's good practice to release the vacuum at the input port before turning off the pump.*
9. Turn the motor power switch to OFF (left), remove your hoses, and cap the ports to keep components free of contaminants.
10. Disconnect from the system and unplug from power at the outlet.
11. Drain the contaminated oil while the oil is still warm to keep the pump as clean as possible when stored.

Evacuation with a 3 Port Manifold

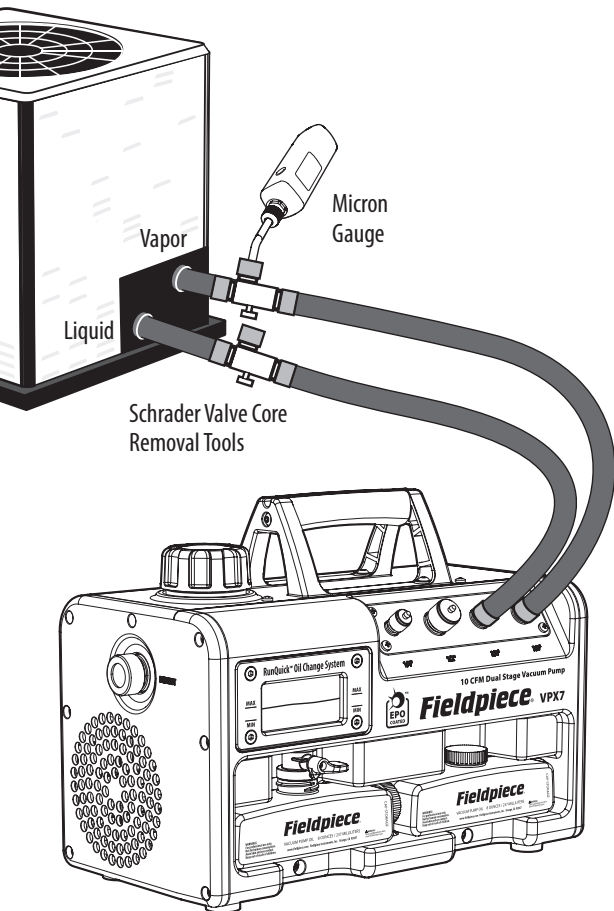
This is a common, but less than ideal evacuation method. Read the tech tips (page 12) for optimum gauge placement and variations to reduce recovery times.



1. Always fill with fresh Fieldpiece Vacuum Pump Oil (page 24). *Running the pump without oil will damage the pump and void the warranty. Oil can be drained while the pump is running if refilled within 3 minutes (within 30 seconds to maintain your vacuum).*
2. Ensure the motor power switch is turned OFF (left).
3. Plug into an outlet (oil backlight should illuminate).
4. Ensure the gas ballast is closed (vertical) (page 26).
5. Connect to the empty, depressurized A/C system.
6. Turn the motor power switch to ON (right).
7. Open line set (hoses, manifolds, removal tools, etc.) to expose the pump to the system. *To reduce oil contamination early in the job, open the gas ballast until the sound of the pump quiets down (about 3000 microns). The yellow LED in the oil window shines if the ballast is open.*
8. After the appropriate vacuum is reached, isolate the system from the pump. You can check the system for potential leaks at this time by monitoring your micron gauge. *Your vacuum pump has a unique oil suck back prevention feature to keep your hoses clear of oil. Still, it's good practice to release the vacuum at the input port before turning off the pump.*
9. Turn the motor power switch to OFF (left), remove your hoses, and cap the ports to keep components free of contaminants.
10. Disconnect from the system and unplug from power at the outlet.
11. Drain the contaminated oil while the oil is still warm to keep the pump as clean as possible when stored.

Direct Evacuation

This is usually the fastest evacuation method. Read the tech tips (page 12) for optimum gauge placement and variations to reduce recovery times.



1. Always fill with fresh Fieldpiece Vacuum Pump Oil (page 24).
Running the pump without oil will damage the pump and void the warranty. Oil can be drained while the pump is running if refilled within 3 minutes (within 30 seconds to maintain your vacuum).
2. Ensure the motor power switch is turned OFF (left).
3. Plug into an outlet (oil backlight should illuminate).
4. Ensure the gas ballast is closed (vertical) (page 26).
5. Connect to the empty, depressurized A/C system.
6. Turn the motor power switch to ON (right).
7. Open line set (hoses, manifolds, removal tools, etc.) to expose the pump to the system.
To reduce oil contamination early in the job, open the gas ballast until the sound of the pump quiets down (about 3000 microns). The yellow LED in the oil window shines if the ballast is open.
8. After the appropriate vacuum is reached, isolate the system from the pump. You can check the system for potential leaks at this time by monitoring your micron gauge.
Your vacuum pump has a unique oil suck back prevention feature to keep your hoses clear of oil. Still, it's good practice to release the vacuum at the input port before turning off the pump.
9. Turn the motor power switch to OFF (left), remove your hoses, and cap the ports to keep components free of contaminants.
10. Disconnect from the system and unplug from power at the outlet.
11. Drain the contaminated oil while the oil is still warm to keep the pump as clean as possible when stored.

Oil Change Procedure

Changing oil is easy and visible. Start each job with fresh oil. Change as needed during the job.

DRAINING OLD OIL

1. For extended pump life, drain the oil immediately after the job instead of waiting until the beginning of the next job.
2. Ensure the pump oil inside is warm enough, $>75^{\circ}\text{F}$ ($>24^{\circ}\text{C}$), for proper drainage. Run the pump for 10 minutes if ambient temp is low.
3. Ensure the motor power switch is turned OFF (right).
Running the pump for longer than 3 minutes without oil will damage the pump and void the warranty.
4. Plug into power to activate the oil backlight.
5. Ensure your old empty oil bottle is located under the oil drain.
6. Open the oil drain valve clockwise (vertical) to empty the oil reservoir of old oil.
7. Close the valve counter clockwise (horizontal).
8. Remove and cap the old oil for disposal.

ADDING FRESH OIL

9. Ensure the drain valve is closed (horizontal).
10. Unscrew the pump's oil fill cap 1/4 turn counter clockwise.
11. Open a new 8 ounce bottle of Fieldpiece Vacuum Pump Oil (OIL8X3). Put the bottle cap on the side of the bottle (CAP STORAGE).
12. Pour the entire 8 ounce bottle of fresh oil into the oil port and ensure the oil level is between the MIN and MAX lines indicated on the window bezel. Replace oil fill cap.
13. Place the empty bottle under the drain valve so it's ready to gather used oil during the next oil change.
14. Your vacuum pump is now ready to operate.

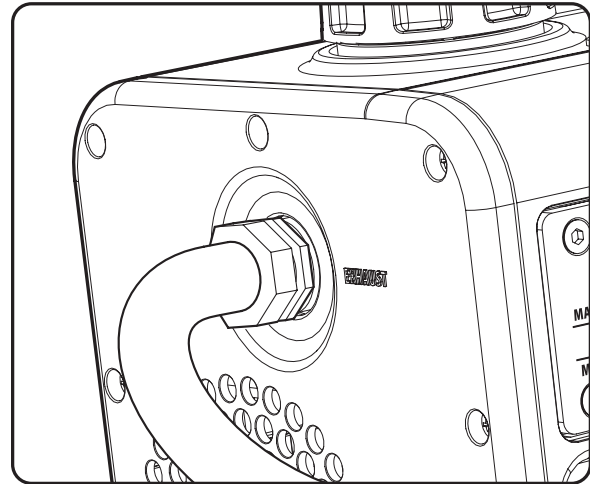
Dynamic Vacuum Measurement

During the pull down, the system's vacuum level drops faster at the front of the system, near the vacuum pump.

To ensure that your full system achieves the target micron level, place the vacuum gauge as far to the back of the system, away from the pump, as possible.

Remote Exhaust

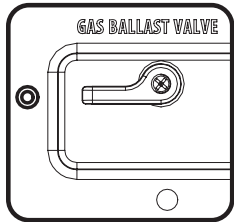
Unscrew the brass EXHAUST cap and connect an obstruction-free garden hose if you need to exhaust oil mist and vapor remotely to the outside of a building structure.



Gas Ballast Valve Switch

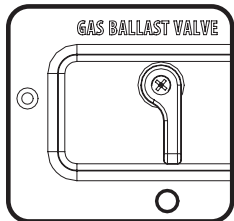
Much of the air and moisture in a system are removed before reaching 3000 microns. For wet systems, you should open the gas ballast during this initial pull down. Doing so helps the pump run smoothly and keeps the oil in good condition for when you need it most -- towards the end of the evacuation.

At about 3000 microns, when the sound of the pump quiets down, the gas ballast should be closed so that a deep vacuum can be generated.



Open

- Set here for initial pumping down (above 3000 microns) of wet systems.
- Yellow window LED shines.
- Discharge stroke exposed to ambient.



Closed

- Normal operating position.
- Yellow window LED off.
- Discharge stroke isolated from ambient.

LED Indicators

Three columns of LEDs in the oil window indicate various states. The blue lights of the right column indicate power is connected. The blue lights of the middle column shine when the pump is switched on. The LEDs of the left column typically indicate the gas ballast valve is open.

SPECIAL MESSAGE (Y/R)	SWITCHED ON (2 BLUE)	PLUGGED IN (2 BLUE)

Special Messages

Yellow Blink (Solid yellow LED on VP67):

Gas ballast valve open.

Yellow Blink + Red Blink (VPX7/VP87):

Low voltage detected.

Red Blink (VPX7/VP87):

High voltage detected.

Red Solid (VPX7/VP87):

Internal fault detected.

Maintenance

General

Wipe with damp cloth to clean the exterior. Do not use solvents.

Storage

Empty or replace oil at the end of every job. Don't leave old oil in the machine. Store the pump and oil in dry clean areas for longest life.

Oil can lose its sealing properties if left uncovered. Keep oil sealed until it's ready for use.

Vacuum Isolation Test

Perform this test to ensure your vacuum pump and your micron gauge are working properly.

1. Connect your vacuum gauge *directly* to a port on your pump.
2. Seal the 3 other ports.
3. Ensure the gas ballast is closed (page 26).
4. Switch your pump ON to create a vacuum at your gauge.

If your gauge measures below 200 microns within 1 minute, you know your vacuum pump *and* micron gauge are working correctly.

If your gauge does not reach 200 microns, there is a problem with your gauge, vacuum pump, or both.

Oil Window Cleaning

It's important to see the condition of your oil as well as the LED indicators located in the oil reservoir.

The large oil drain ball valve will typically drain solids and sludge when changing the oil. When it becomes hard to see through the window, you can remove the oil window for easy cleaning.

1. Ensure oil is drained from the reservoir.
To reduce residual oil spillage, do not lay the pump on its side.
2. While holding the black bezel (frame) in place, use a hex key (Allen wrench) to remove the 4 hex socket screws.
3. While holding the glass oil window in place, remove the black bezel and notice the o-ring located behind the window.
4. Slowly remove the glass oil window while making sure to locate and remove the o-ring seal.
5. Wipe away any spilt oil, but leave a bit of oil on the o-ring to ensure a good seal.
6. Clean the glass oil window and set aside to dry.
7. If desired, you can use a light bristle brush clean out the oil reservoir itself, but performance is rarely affected by a dirty reservoir.
8. Place the o-ring back into its groove.
9. Place the glass oil window over o-ring and hold in place.
10. Reinstall the bezel over the glass oil window using the 4 hex socket screws. *To avoid breaking the window, start all 4 screws before hand-tightening any of them. Do not overtighten.*

Troubleshooting

Appropriate vacuum is never reached.

Ensure the gas ballast is closed (vertical position, yellow LED off).

Ensure oil is fresh.

Ensure oil level is between MIN and MAX lines.

Ensure all port caps are closed and have working seals.

Limit amount of connections. Check for leaks at connections.

Use vacuum rated hoses.

Check for blockages between the pump and the system.

Check for a system leak.

Verify your vacuum gauge is in the correct location and is accurate.

Use the right pump for the job, 6CFM up to 10CFM (over 50 tons).

Perform a triple evacuation to carry moisture out of the system by purging the system with dry nitrogen.

Vacuum rises when isolating the system.

Ensure your micron gauge is located on the system side of the shut-off valve. The micron gauge of a 3 port (2 valve) manifold cannot measure a system's vacuum if the valves are closed. Use a shut-off valve at the third port to isolate the pump from the system (page 20).

Check for a system leak.

Oil backlight does not turn on when plugged in.

Ensure power cord and outlet are functional. If backlight does not shine and the pump turns on, the oil backlight LED module may need to be replaced.

Pump makes excessive noise.

The pump may be experiencing a high load.

Loose objects may be vibrating in the case.

Motor bearings may be bad. Motor needs to be replaced.

Motor may have come loose. Tighten motor mount bolts.

Oil level or condition may be bad. Change the oil.

Leaks may be present. Tighten or fix all connections.

Oil mist is coming out of the exhaust.

Some slight oil mist is normal due to airflow carrying oil as it passes through, and out of the pump. You can attach a garden hose to the exhaust port to control oil misting (page 25).

For larger systems with long evacuation times, extended high pressure conditions can cause excessive misting to occur. Add oil as needed if excessive oil loss occurs.

Motor does not start when switched ON.

Models VPX7/VP87 have a soft-start feature that slowly increases speed during startup. Slow startup in cold temperatures is normal.

Oil in the pump may have become overly viscous due to contamination or low temperature. Use fresh Fieldpiece Vacuum Pump Oil within the pump's operating temperature.

The pump may be cold. Warm the pump in your truck/home by letting it sit in warm environment. You can warm the oil in your truck/home before adding it to the pump.

The pump may be cold. Open an unused input port to ambient for a few seconds until the pump is running.

Voltage is incorrect. Ensure proper voltage and cord length.

Motor may be damaged. Motor needs to be replaced.

Motor thermal protection activated. Wait for the machine to cool down to operating range and determine why it may have overheated. Loading may be excessive.

Oil is leaking around base.

Oil likely fell into the housing from around the fill port and is now dripping through the internal housing. Wipe clean and make sure oil is not spilled when adding to the wide mouth oil fill port.

Limited Warranty

This machine is warranted against defects in material or workmanship for one year from date of purchase from an authorized Fieldpiece dealer. Fieldpiece will replace or repair the defective unit, at its option, subject to verification of the defect.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the machine.

Any implied warranties arising from the sale of a Fieldpiece product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. Fieldpiece shall not be liable for loss of use of the machine or other incidental or consequential damages, expenses, or economic loss, or for any claim of such damage, expenses, or economic loss.

State laws vary. The above limitations or exclusions may not apply to you.

Obtaining Service

Visit www.fieldpiece.com/rma for the latest information on how to obtain service.

Warranty for products purchased outside of the U.S. should be handled through local distributors. Visit our website to find your local distributor.

VP67

VP87

VPX7