Petro Specialties, Inc.

Installation Manual

PetroVac - Vacuum Pump System (Patent Pending)

1. Introduction

The PetroVac vacuum pump system is a positive displacement vacuum pump designed for use as a vacuum source in interstitial monitoring of double-walled tanks, piping, and containment sumps where a submersible turbine is not required in the system design or operation. It is intended for systems using the Veeder-Root TLS-450Plus Automatic Tank Gauge (ATG) console with the Secondary Containment Leak Detection (SCLD) module.

2. System Components

- PetroVac Positive Displacement Vacuum Pump
- UL Cabinet
- Red Jacket Pump Control Box – 880-041-5 (supplied by contractor)
- Veeder-Root TLS-450Plus Console with SCLD Module (supplied by contractor)
- Vacuum Tubing and Fittings
- Air Discharge Filter
- Air discharge pipe with mushroom insect screen
- Explosion-Proof Wiring Components (as required by code)
- Explosion-Proof Switch (with lockout)
- Explosion-Proof “Pump On” indicating light
- Multiport Vacuum Block

- Vacuum Gauge
- Vacuum Relief Valve

3. Pre-Installation Requirements

- Verify compatibility of all tanks, piping, and containment sumps with vacuum monitoring systems.
- Confirm interstitial volume does not exceed 2,114 gallons for tanks or 2,642 gallons for piping.
- Ensure all wiring and installation comply with local, state, and national codes.

4. Installation Steps

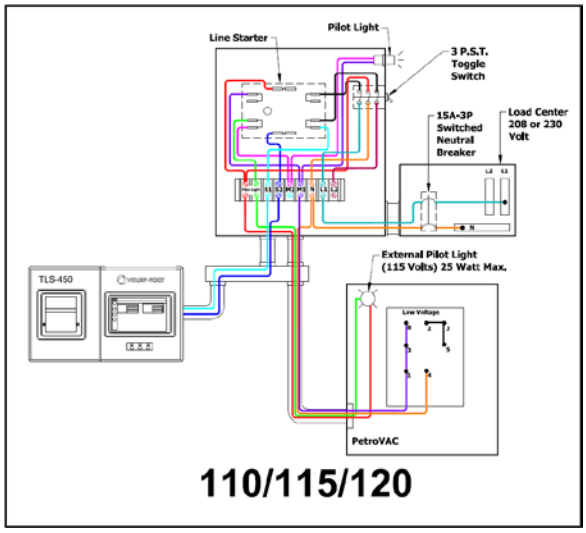
A. Mounting the Pump Cabinet

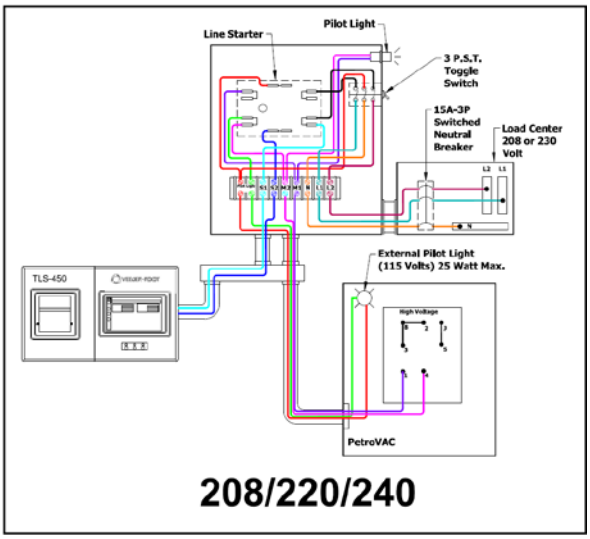
- Mount and secure the PetroVac cabinet on a wall, engineered structure or PetroVac Legs.
- Ensure adequate access for maintenance. The cabinet must meet all local codes for access clearance.
- If the cabinet is mounted indoors the exhaust pipe and mushroom cap must be plumbed to the exterior of the building. It is not recommended that the PetroVac be installed in occupied spaces due to the noise level of the pump.
- If the PetroVac is to be used for any Class-I liquids it cannot be mounted on the interior of any building.

B. Electrical Connections

- The PetroVac system operates on a single 220v 20amp circuit (the system can operate on 110v but 220v is recommended). All wiring is to be THHN/THWN-2 oil resistant, 12 AWG (min), stranded copper. (Fig 1)
- Connect the pump to the Red Jacket Pump Control Box utilizing the provided explosion proof junction box (only a Red Jacket 880-041-5 control box is to be used with the PetroVac). Note that all electrical must meet the NEC and local codes for Classified areas. An explosion proof seal off must be used under the cabinet for all incoming electrical. (Fig 1)
- Wire the control box to the TLS-450Plus console as outlined in the Veeder Root and Red Jacket installation manuals and connect power from the source panel.
- Ensure the power switch is accessible and all wiring is properly grounded.

Figure 1

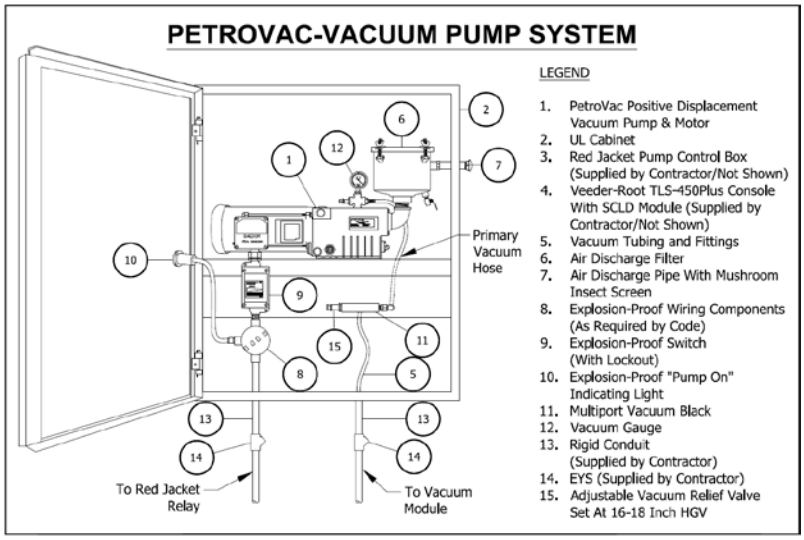




C. Vacuum Tubing

- Connect Veeder Root vacuum tubing from the multiport vacuum block to the point of connection on the Veeder Root Vacuum Module (this connection is the same as connecting the vacuum port of a submersible turbine). All tubing connections are to be made with Veeder Root tubing and fittings and per the Veeder Root installation instructions.
- All tubing must run through ridged or EMT conduit.
- Any tubing run from a classified location must be run through ridged conduit. EYS (seal off's) must be used within the classified location and just under the PetroVac cabinet. Seal off's must be sealed per the manufacturer's installation instructions. (Fig 2)

Figure 2



D. System Integration

- Continue with the Veeder Root system installation as detailed in the installation instructions. The Veeder Root will control the vacuum pump to initiate vacuum to the Veeder Root module. There is no interconnectivity between the PetroVac and Veeder Root TLS450. The PetroVac is an independent vacuum source like the vacuum source of a submersible turbine.
- Conform that the TLS450Plus is programmed for positive shutdown of the PetroVac if liquid is detected in a vacuum sensor.
- The Vacuum Sensors connect to tank, sump and piping interstices. Each Vacuum Sensor must have an associated Liquid Sensor, which is included in the pre-assembled Veeder Root Vacuum Sensor Monitoring Kits.
- It is recommended that the cabinet door remains open during the initial vacuum draw or during system testing to extend pump life.

E. Final Checks

- Inspect all connections for leaks.
- Power on the system and verify the correct operation of the PetroVend.
- Verify that the PetroVac does not draw more than 16 in Hg, verify utilizing the provided vacuum gauge and the Vacuum Relief valve and adjust as required (Fig 2). Note: this valve must be verified and certified during each annual leak detection monitor certification.

F. Sequence of Operations

- The TLS-450 monitors the vacuum level in the interstitial space of the monitored system (e.g., double-walled piping and tanks).
- The system maintains a normal operating vacuum level ranging from -9 psid to -3 psid, depending on the specific system being monitored.
- If degradation in the system is detected and the vacuum is not maintained at the required levels, the TLS-450 automatically energizes the independent vacuum pump via the turbine relay to restore the vacuum to the normal level.
- The TLS-450 scans the Secondary Containment Leak Detection (SCLD) card every 8 seconds to take readings and monitor the vacuum level.
- If the vacuum level decreases to within 1.7 psi of ambient atmospheric pressure, the system generates an alarm.
- A warning is generated if the flow rate of replenishment of the containment volume exceeds 100 liters per hour.
- All alarms and warnings produce audible and visual indications on the TLS-450 console.

- The system may be programmed to disable the delivery of product to the generator or applicable equipment when an alarm condition is detected if allowed by code.
- If an alarm threshold is reached, the TLS-450 provides an audible visual alarm and shuts off the suction pump if allowed by code.
- If a liquid alarm in the vacuum sensor is initiated, the TLS-450 must provide positive shutdown of the PetroVac vacuum pump.
- Manual intervention, using console switches or signals sent on the serial communications port, is required to diagnose the problem, clear the alarm, and restart the PetroVac vacuum pump.

PetroVac is available in two volume options and three cabinet options.

Low volume up to 1,000 gallons of total secondary volume – USV7F

High volume 1,001 gallons and over of total secondary volume – USV15F

White cabinet – WHT

Grey cabinet – GRY

Stainless Steel cabinet - SS

PetroVac Model Numbers

PV331-USV7F-WHT

PV332-USV15F-WHT

PV333-USV7F-GRY

PV334-USV15F-GRY

PV335-USV7F-SS

PV336-USV15F-SS

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Disclaimer

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Veeder-Root has granted limited approval for the use of the PetroVac system as a vacuum source with the TLS-450Plus console and SCLD system, in place of a submersible turbine pump, for specific applications as evaluated by Ken Wilcox Associates. Documentation of this limited approval from Veeder-Root is available from Petro Specialties, Inc. upon request.

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