Model VP1200 Vane Pump

Application, Maintenance and Installation Instructions

Description

The Healy System, Model VP1200 vane pump is designed to be used with Healy Systems gasoline vapor recovery systems. It is a rotary vane pump, driven by a belt or direct-coupled to an externally mounted motor.

Design capacity is for a vapor volume of 20 gallons per minute (76 LPM) when driven at 1900 RPM. Pulley selection to obtain 1900 RPM should be made at the installation site.

The brass plug and regulator valve on the pump body are interchangeable to account for various mounting methods and shaft (12mm) rotation. Multiple mounting holes (M6) are provided to give flexibility in securing the unit to a rigid base.

Installation

Note: Installation and maintenance of this unit should only be done by trained petroleum equipment technicians.

The drive pulley for the 12 mm shaft must be selected to achieve a rotational speed of approximately 1900, ± 100 RPM (2100 RPM max.). This will provide sufficient vacuum of 80+" WC, (200+ mbar) to allow operation of Healy Systems, Inc. Model 400, 600, or 800 nozzles.

To determine the size for the vacuum pump shaft pulley, see the sample below, using a 2.5" (63.5mm) motor pulley.

Motor Pulley Diameter X Motor Speed (RPM) / 1900 = VP1200 Pulley Size

\[
\frac{2.5 \times 1725}{1900} = \frac{4312.5}{1900} = 2.27" \text{ (2.25" or 57.6mm)}
\]

A double pulley is recommended to drive the vacuum pump. This will provide equal tension to the vacuum pump shaft. One belt links to the motor, and the other to the product suction pump. (Figure 2).

Application

There are two versions with 4 mounting variations of the Model 1200 pump, identified by a dash (-) number. The dash numbers are visible on top of the regulator valve (marked with a ® symbol).

The units have the relief valve set for 80" water column, (200 mbar) and is designed for use in applications where there is essentially zero (0.00 WC) back pressure on the discharge side of the pump.

- Version one (-1) has filter screens in the ports.
- Version three (-3) has the addition of flame arrestors.

Operational temperature: -40° to 140° F (-40° to +60° C).

Service life, in a normal operating gas station: two years; Shelf life: indefinite.

Figure 1: VP1200 Vacuum Pump

Figure 2: Vacuum Pump Mounting
Put the pulley on the shaft and align a set-screw with the key. Tighten the set-screw to 15-20 in-lb (1.7-23 Nm) (Figure 3).

![Figure 3: Pulley Mounting](image)

Locate screw over key
Torque to 15-20 in-lb (1.7-23 Nm)

Align the pulleys so they are in-line with a maximum misalignment of 0.063" (1.6mm). Adjust belt tension for a mid-point deflection of 0.25 to 0.5" (6.35 to 12.0 mm) See Figure 4.

![Figure 4: Belt Alignment and Tension](image)

Belt Tension
0.25" to 0.5"
(6.35 to 12.0mm)

Max Misalignment
0.063" (1.6mm)

The vacuum pump unit is shipped configured to have the regulator valve in the right port, when the ports are "up" and the operator facing the shaft (Figure 5).

![Figure 5: Regulator Position](image)

Regulator location depends upon shaft rotation

The unit is configured to have the shaft turn counterclockwise (when facing shaft). If the installation requires that the pump shaft turns clockwise, exchange the positions of the regulator valve and the plug. Also, be sure to change the in and out designations of the pump to have the input on the right (when facing shaft) and the output on the left. Always have the regulator valve on the same side of the pump as the output. Mount the unit so the regulator is facing up, or located in the port above the shaft.

Secure the pump unit to a rigid base, using mounting holes and M6 hardware as required. Be sure to allow for tension adjustment and belt wear. Be sure pulleys are properly aligned to assure belt reliability.

Vapor ports are threaded for ½" - 14 B.S. pipe thread. Blowout the vapor line before connecting it to the pump to be sure there is no debris in the piping.

**Maintenance**

Installer to provide union couplings at both the input and output ports of the pump to allow for maintenance. Installation of a ball valve and test port is recommended on the inlet piping for testing and troubleshooting. Drive shaft and associated bearings are service free.

**Filter Screens Or Flame Arrestors**

The filter screens or flame arrestors protecting the 'IN' and 'OUT' ports should be serviced yearly. Remove the plumbing hardware to allow access to the pipe port recesses. Use supplemental light to look in to each port to be sure screens or arrestors are free of dirt or other particles that would block vapor flow into or out of pump. If debris is large enough to pick out, use tweezers, being careful not to enlarge any holes in the screens or arrestors.

If screens must be removed, use extreme care. Carefully grasp an edge of the screen with long nose pliers and wiggle the screen out of the recess. Do not compress or deform the screen or enlarge any of the holes. Clean the screens in alcohol or suitable solvent to dissolve dirt, grime and dust. Reform the screens to original shape if necessary. Use a 7/16" (11 mm) deep socket to push in and re-seat the screens in the recess. Be sure screen is seated past the internal threads.
Flame arrestors found on version -3 are placed further into the threaded recess. These arrestors are held in place with internal retaining rings and require special pliers to remove them. In ordinary use, these arrestors will not need cleaning. If you observe that the arrester on the outlet is heavily covered with black dust, that would be an indication that the flame arrestors may need cleaning.

To clean, remove the filter screen as above and use retaining ring pliers - pliers tips must be at least 3/4" long - to remove the ring. A pair of very thin tipped tweezers is necessary to reach in and remove the flame arrester. Use care not to enlarge or damage the mesh in the arrester. Clean the arrester in alcohol or other suitable solvent to remove encrusted dirt.

Using the tweezers, grasp the arrester with the large end toward your hand. Gently guide the part down through the threaded portion of the casting and be sure it firmly seats in position. The retaining ring groove will be visible when the proper depth has been reached. Reinstall the retaining ring and filter screen. Be sure the retaining ring seats properly in it's groove.

**Testing**

Use the plugged ¼" port on the side of the pump, to install a 0-100 inches water column (250 mbar) gauge.

**Note:** If there is no vacuum reading, or a slightly positive reading, with the pump running, check to be sure the regulator valve is installed correctly.

With the pump running, but not dispensing, the gauge should read about 80" WC (200 mbar). With the pump running and dispensing 10 GPM (37.8 LPM: Liter per minute), the gauge should read about 70" WC (174 mbar). If these numbers cannot be achieved, check for blockages in either the input or output vacuum pump ports plumbing lines and/or high back pressure in the product tank.

**Vane And Rotor Maintenance:** The vane and rotor of this unit should not require maintenance unless they have been damaged or have been required to pump substantial amounts of liquid rather than vapor. The pump should be removed for vane and rotor replacement due to the very close tolerances involved.

**Vane/Rotor Replacement**

**Caution**

Disconnect power before beginning service.

1. The work area must be clean and have sufficient lighting.
2. Disconnect the vapor piping connected to the IN and OUT ports of the VP1200.
3. Remove the pump cover screws and carefully remove the cover.

**Caution**

Use a spill cloth when removing the cover, as there may be some gasoline inside the pump cavity.

4. Turn the rotor assembly gently by hand until the shaft key notch is at the 12 o’clock position (See Figure 6).

5. Remove the rotor, vanes and shaft key from the pump housing.

**Note:** Place your hand or a container under the rotor while removing. Do not use any sharp objects that would scratch the pump cavity, shaft, rotor or vanes.

6. Rotate the shaft by hand. If the shaft does not rotate freely, the entire pump needs replacement.

7. If the rotor and vanes are cracked, chipped, excessively worn or dirty, the rotor and vanes should be replaced because cleaning alone will not remedy the situation (PN VP1200VR).

8. If there is no visible damage, use a lint-free cloth with isopropyl alcohol to clean the rotor and vanes.

9. Using a lint-free cloth with isopropyl alcohol, thoroughly clean the inside of the pump ring, the rear of the pump cavity, the rotor shaft and the inside of the cover.

10. Reposition the shaft (if necessary) so that the shaft key notch is in the 12 o’clock position. Install the cleaned original or new shaft key onto the shaft.

11. Carefully install the cleaned original or new rotor onto the shaft followed by the cleaned original or new vanes into the rotor.

**Note:** The rotor assembly should slide on to the shaft easily, without excessive force. Rotors and vanes are reversible.

12. Reattach the back cover to the pump body.
13. Re-connect the vapor piping to the IN and OUT ports of the pump.
14. Test for normal operation. (See Testing Instructions).
Figure 7: VP1200 Dimensions

NOTE: All dimensions are approximate

M6 x .40 DEEP
12 HOLES MAX

See page 1 for Pulley sizing

(5.34)
(1.13)
(1.90)

1/2-14 BS pipe thread (2 PLCS)

See page 2 for rotational details (Inlet/Outlet)

(3.54) (4.96)
(2.20)
(0.20) 4 PLCS

(0.88) 4 PLCS

M6 x .40 DEEP
12 HOLES MAX

12 HOLES MAX

See page 1 for Pulley sizing

(3.45)
(1.25)
(0.20) 4 PLCS

(3.54)
(4.96)
(2.20)

(0.88) 4 PLCS

1/2-14 BS pipe thread (2 PLCS)

See page 2 for rotational details (Inlet/Outlet)