



**SET-UP, OPERATING and MAINTENANCE INSTRUCTIONS**

**For**

***SAFE Systems, Inc.***

**VACUUM RECOVERY UNIT**

**MODEL**

**PD 2400-E**

## SET-UP PROCEEDURE

1. Ask the driver for the **Packing Slip** from the shipper. Keep this paperwork with the equipment so that when the unit is returned there is a list of the components that came with the unit. The person loading the equipment for its return can check this list to insure that all the components are present. This will help to avoid additional charges for missing components.
2. Unload the equipment with the properly sized forklift or crane.
3. Locate the equipment on a level surface where it is to be operated.
4. Have a licensed electrician connect the proper power source to the equipment.
5. Remove the shipping seal from the 4" vacuum inlet on the top of the vacuum producer.
6. Have the electrician start and stop the unit to check for the proper rotation of the pump. If the rotation is incorrect, have it corrected. (Warning: Do not change the power cord connections inside the control box, this may cause damage to the circuit breaker). If changes in the wire connections are required do those changes at the power source.
7. Connect the vacuum hose to the 4" vacuum inlet on top of the machine and connect the other end of that hose to the abrasive collection equipment.
8. Make sure all the hose connections are vacuum tight by taping or clamping these connections.

## **OPERATING PROCEEDURE**

1. Turn breaker on the PD 2400-E control box to the "ON" position, a green POWER ON indicator light should illuminate.
2. Make sure the end of the vacuum recovery hose in a safe location and is not lying near any unsuspecting personnel.
3. Make sure the vacuum recovery hose in not lying in water, near trash or against a structure. There should be no restriction in airflow during start-up. Any restriction in airflow during the start-up of the vacuum may cause the motor to draw too much amperage and it may damage the electrical control system.
4. Push the START button on the PD 2400-E control box to start the pump and motor. This unit is equipment with a Wye/Delta start system that allows the motor and pump to "Ramp-up" to speed. This keeps the amperage draw low at start-up and it allows the drive system to start spinning slowly and then ramps up to normal operating speed.
5. Check and record the "free air" reading on the vacuum gauge on the PD 2400-E.
6. Let the vacuum run for about 5 minutes prior to starting the abrasive recovery process. This allows the hoses to clear of any residue and allows the pump to warm-up with no restrictions in the airflow (free air).
7. This equipment has a SAFETY FILTER (see filter specification sheet) to protect the vacuum pump from damage in the case of a filter failure in the abrasive collection equipment prior to the PD 200-E. This filter is the last line of protection for the pump. The filter housing is equipped with a magnehelic gauge that reads the differential pressure between the pump inlet side of the filter and the abrasive collection equipment side of the filter. **The normal operating range on this gauge during vacuum recovery operations should be between .5" to 15"**. This reading may exceed 15" when in the pump is operating at "FREE AIR" conditions. If the reading is above or below this range during **vacuum** operations the equipment should be shut down and the cause for the high or low reading determined.
8. The normal vacuum reading can range is from 4" to 25". It will vary up and down during the vacuum recovery operation. If the reading is always very high (24'-27") and it does not vary up and down during the recovery operation the equipment should be shut down and the hose should be checked to see if it is blocked or plugged. It is not a good

- practice to run the pump and motor while the airflow is completely blocked. This is hard on the equipment and can cause damage to the pump or motor.
9. Periodically check the reading of the magnehelic gauges and the vacuum gauge. This should be checked on a regular basis (every couple of hours). If the readings start to climbing rapidly the system should be shut down and the cause determined.

## SHUT DOWN PROCEEDURE

1. Stop the abrasive recovery process and set the vacuum hose in a safe location away from personnel where it is only sucking "free air".
2. Allow the system to run in the free air condition until all the abrasive is out of the recovery hose. This can take up to 15 minutes to completely clear the hoses. **This step is very important!** Do not start this system with the recovery hose blocked or plugged. This can cause damage to the equipment.
3. Record the magnehelic and vacuum gauge reading on a Daily Log Sheet.
4. Push the stop button and the PD 2400-E. Warning: Do not use the main circuit breaker on the control panel to turn the PD 2400-E.
5. Turn the main circuit breaker to the "OFF" position.

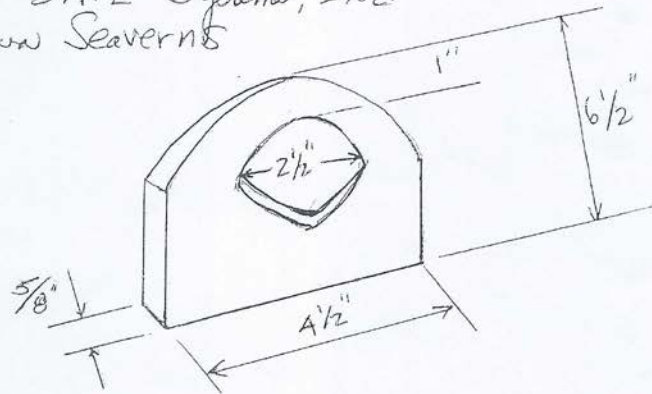
## OPERATIONAL TIPS

1. The vacuum produced by this equipment is very dangerous! Only trained personnel should be allowed to operate this equipment.
2. Try to keep the vacuum hose runs as short as possible. Long horizontal hose runs will cause the abrasive to settle out in the hose and can eventually block off the air flow completely especially if the air flow goes below the 60/40 mix.
3. Be careful not to overfill the abrasive collection equipment prior to the PD200-E.
4. If the Safety Filter becomes blinded and fails this will cause damage to the vacuum pump.
5. A daily log recording the reading of the magnehelic gauge and the vacuum gauge is recommended to help track how the equipment is operating and it gives the operator a chance to address issues before they become problems.

## PREPARATION OF EQUIPMENT FOR RETURN FROM RENTAL

1. Allow the vacuum to run with free air to clear all the hoses of abrasive and debris.
2. Disconnect the vacuum hose from the PD 2400-E to the abrasive collection equipment.
3. Secure/disconnect the AC power from the PD 2400-E and the VDC-4. Coil the power cords up for transport.
4. Discount all vacuum hoses and cover all the hose connections for transport.
5. Clean the unit of any dust or abrasive residue.
6. Close and secure the access doors for shipment.
7. Gather and secure for transport all the accessories sent with the equipment (if any).
8. Properly secure the equipment on the truck or trailer using proper tie-down procedures. Use the lifting eyes and forklift tubes for attachment of the chains or straps. This will minimize the risk of causing damage to the unit during transport.
9. Make a note of any problems experienced during the operation of this equipment and a contact name and phone number so our technician can contact this person. Give this note to the delivery person returning the equipment.
10. We hope this equipment rental went well for you and we look forward to assisting your company in future projects. Thank you for your business.

From: SAFE Systems, Inc.  
By Glenn Seaverns



Unit: Model PD 2400E - Vacuum #004642-1

Material: SA 36

$$F_y = 36,000$$

$$F_r = 0.4 F_y = 14,400$$

$$P = 2(e - d/2)t \times F_r = 2(2.25 - 2.5/2) \times 0.625 \times 14,400$$

$$P = 18,000 \text{ lbs ea.}$$

$$4 \text{ Pads total} = 72,000 \text{ lbs total}$$

$$\text{weight of unit} = 10,000 \text{ lbs}$$

Conclusion: Padeyes used together are Satisfactory