Operation

Figure 1: Piping Configuration

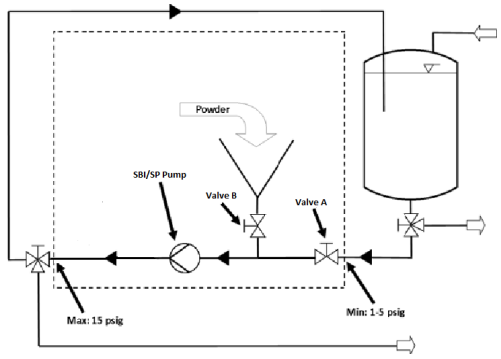
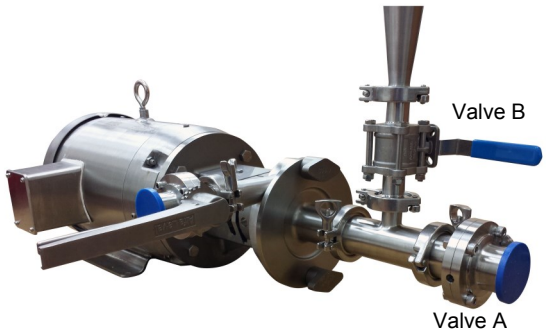


Figure 2: Pump Overview



1. Once the PI system is connected to the process tank or inline in the process flow, flood the pump by opening valve (A) and discharge valve (if applicable). CAUTION: DO NOT OPEN VALVE (B) UNTIL FLOW AND VACUUM IS ESTABLISHED.
2. Establish flow by starting the motor. Ensure the motor is turning the correct direction. The direction is counter-clockwise when viewed from the pump's side. Set the discharge valve for highest flow allowable for the motor. Do this by monitoring motor current and comparing it to the nameplate full load current or "FLA".
3. Once flow is established, if the discharge valve does not need to be restricted because the motor is large enough, open valve B and witness the quality of the vacuum. Good vacuum and induction qualities should include:
    a. Minimal splashing into upper part of tee, valve or similar areas
    b. Bottom portion of tee is only half, or slightly more full. This should stop the upper portion of the flow from hitting the walls of the tee and back splashing.
    c. Steady, audible flow with no intermittent changes in pitch or sound.
    d. Perceived steadiness to the vacuum: no surging.
4. If you do not achieve all of the properties above, valve (A) must be throttled. Usually valve (A) must be throttled if the discharge needs to be restricted to meet a lesser flow rate. This is because backpressure is adverse to vacuum capability. Throttling valve (A) allows the pump to pull through a smaller orifice to artificially increase vacuum. Open valve (B) slowly. CAUTION: IF LITTLE TO NO VACUUM IS PRESENT, PRODUCT WILL RISE UP THE TEE AND EXIT VALVE B. IF PRODUCT IS HOT OR DANGEROUS DO NOT EXPOSE YOURSELF TO IT. PROPER PPE SHOULD BE WORN AT ALL TIMES. Once valve (B) is open, throttle (partially close) valve (A) until you can achieve all the properties in step 3, "a" through "d". If valve (A) is a butterfly or ball-type valve, the orientation will affect the flow qualities in the tee area. Try turning it until the least amount of splashing occurs. Throttling valve (A) also changes the proportion of liquid to powder intake and too much powder can cause poor product quality.
5. Close valve (B) once steps 3 or 4 have led to good flow and vacuum properties. Fill the hopper with dry ingredient. Open the valve (B) until the powder is induced.
6. Once the powder is induced, close valve (B) immediately. Products that are sensitive to foaming may see adverse effects from introduction of air.
7. With valve (B) closed, recirculation may be performed if applicable. Ensure that the motor current is monitored, since viscosities and specific gravities may be increased from dry ingredients.