

Operating Instructions for Fristam Powder Mixer

Fristam's Powder Mixer provides quick, high-performance blending of wet and dry ingredients into a fluid stream. What makes Fristam's Powder Mixer unique is its proven pump and blender system that is efficient and easy to use.

The FZX Liquid Ring Pump creates consistent suction at the bottom of the funnel to prevent plugging and maintain powder rate, even as viscosity increases.

The rotor-stator design of the FS Series Shear Blender eliminates unblended product and prevents lumps and masses for consistent batch-to-batch repeatability.

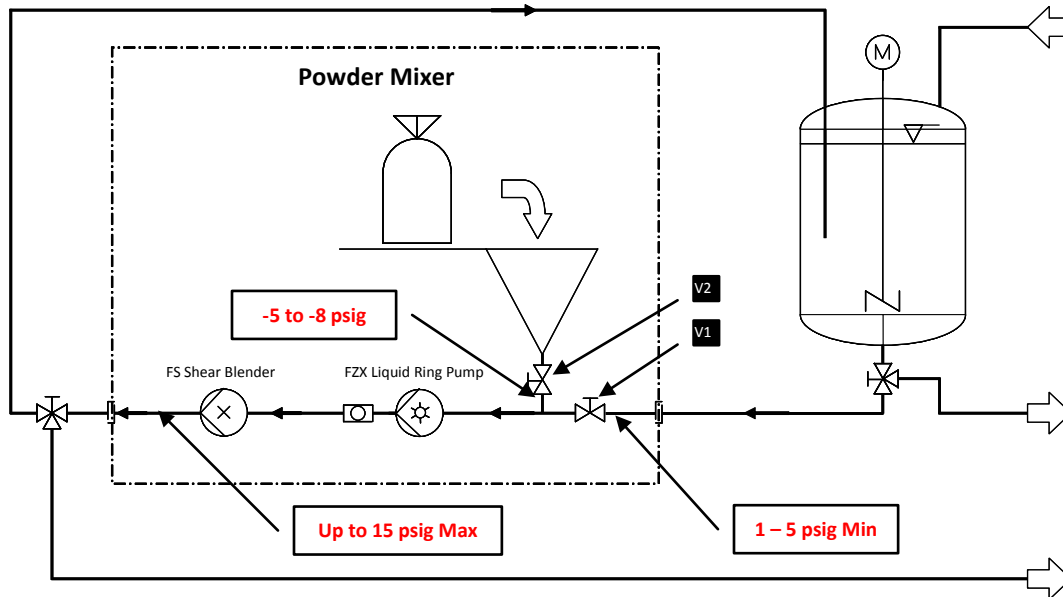


How It Works

1. The FZX pump draws the base fluid out of the batch tank and transfers it through a short pipe to the Powder Mixer.
2. When the FZX pump is throttled at the suction side by the liquid control valve, a strong vacuum is generated in the “Y” pipe below the funnel.
3. This vacuum draws the powder directly into the fluid flow. As this mixture passes through the FZX pump, mixing begins to take place.
4. The FZX then pumps this premix through the FS Shear Blender where any remaining lumps are eliminated by high turbulent action.
5. The product mixture is pumped from the Powder Mixer to a batch tank or another process tank.



Connecting the Powder Mixer to Your Batch Tank



The ideal position for the Powder Mixer is within 10 feet of your mixing tank. This helps to limit the head loss in the suction side. The following system pressures will allow the Powder Mixer to perform at its maximum capacity:

- Pressure just prior to the liquid control valve V1 should be 1 – 5 psig.
 - The Powder Mixer operates at its best when pulling liquids from a tank at atmospheric pressure.
 - If you must use a pump to feed the product to the Powder Mixer, Fristam recommends the use of a balance tank at the inlet of the Powder Mixer to dissipate the pressure.
- Pressure at the discharge of the FS Shear Blender should be no greater than 15 psig.
 - If your discharge pressure will be greater than recommended, Fristam recommends you use a take-away pump to move the product away from the Powder Mixer.

ATTENTION:

It is important to use suction rated hoses on the inlet side of the Powder Mixer. The high vacuum created by the Powder Mixer can collapse a standard non-reinforced plastic hose.

Fristam Pumps also recommends that the hose sizing is comparable to the inlet and outlet port sizes on the Powder Mixer.

Electrical Installation of a Powder Mixer

ATTENTION:
The control panel on all trial units is NEMA 3R & 12 and requires 40 or 60 amps at 460 volts. See chart below.

The electrical cord should be run through the access hole in the bottom of the control box and connected to the terminals near the main switch inside the control panel.

Checking for Proper Rotation of the Pumps

Shut the throttling valve V1, then open the funnel valve V2. Fill the funnel with water until the mechanical seals are completely wetted and water is visible in the sight glass.

ATTENTION:
Never run the FZX Liquid Ring Pump or FS Shear Blender dry. Seal damage can result.

Briefly switch on and off both the FZX Liquid Ring Pump and FS Shear Blender to check for proper rotation. Proper motor direction is clockwise when looking at the fan end of the motor. To change the direction of rotation, switch the wires that have been fed to the control panel.

Fristam Pumps Trial Unit Sizes

Model	FZX Pump		FS Shear Blender		Electrical Requirement	
	Model	HP	Model	HP	Volts	Amps
10-52	2100	7.5	3522	15	460	40
20-53	2200	15	3532	25	460	60



Operating the Powder Mixer

1. Shut the powder control valve **2**.
2. Fully open the liquid control valve **1**.
The liquid should flow from the tank to the Powder Mixer.
3. Switch on the FZX Liquid Ring Pump **3** and circulate the liquid (e.g. water, cream, milk etc.) until full flow is established.
4. Switch on the FS Shear Blender **4**.
5. Close the liquid control valve **1** to approximately 50%. This allows a sufficient vacuum to build up below the funnel. To decrease the vacuum and draw powder in slower, slowly open the liquid control valve **1**.
6. Open the powder control valve **2** and check the suction inside the funnel with the back of your hand. If suction is not sufficient and/or liquid comes up through the funnel, slowly close the liquid control valve **1** until sufficient suction is achieved.
7. Close the powder control valve **2**.
8. Fill the funnel with powder.
9. Carefully open the powder control valve **2**.



ATTENTION:

When working with products that swell, (e.g. pectin or gums) take great care to induct the powder slowly, so that the pumps do not plug. To pull these powders in slower, open the liquid control valve **1 to reduce the vacuum under the funnel and only partially open the powder control valve **2**.**

10. As soon as the funnel is empty, close the powder control valve **2** to prevent air from being sucked into the product.
11. In the case of shear-sensitive products, switch off the FS Shear Blender **4** immediately.
12. You may circulate your product as needed for further blending.

Cleaning the Powder Mixer

ATTENTION:

Always clean the Powder Mixer after each use. If the pumps are not properly cleaned, product residues can clog up the mechanical seals and cause damage at the next start-up.

The Powder Mixer can be cleaned via an existing CIP system. The funnel, y-pipe and control valves can be cleaned by hand. These can be removed if necessary by disconnecting the clamp connection at the bottom of the funnel.

Documentation

- The circuit diagram for the control panel is in the control cabinet.
- Maintenance manuals for each of the pumps are in the control cabinet.

Spare Parts List

- For tables built after June 2008.

<i>Part Number</i>	<i>Description</i>
1912000152	2.5 In. Südmo BFV – K588Z-F-2.5
1912000190	2.5 In. Südmo BFV Seat - Viton
1912000131	2.0 In. Shae Sight Glass 316 – Polysulfone Lens / Viton Gasket
1912000162	2.0 In. Shae Sight Glass Insert Lens – Polysulfone
1912000163	2.0 In. Shae Sight Glass Gasket – Viton
1181000026	2.0 In. Clamp Gasket – Viton®
1181000048	2.5 In. Clamp Gasket – Viton®
1297000288	ABB Stop Button Lens and Clamp Ring
1297000289	ABB Start Button Lens