



Chemical Feed Pump Accessories
Operating Manual

Installation and Operation Manual

Chemical Feed Pump Accessories

by
 SIGMAMOTOR INC.



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SigmaMotor Inc.
PO Box 298
3 North Main Street
Middleport, NY 14105
Tel: 716.735.3115

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1.0 Introduction

Sigmamotor Chemical Feed accessories from Sigmamotor are used to enhance the performance of chemical feed pumps and systems.

Back Pressure Valves provide a constant discharge head pressure and acts as an anti-siphon valve.

Pressure Relief Valves return chemical to the source container in the event of an over-pressure situation.

Calibration Cylinders facilitate calibration of a chemical feed pump through the use of a draw-down test. The cylinder provides a simple, easy-to-read means to determine the pumping rate of a chemical feed pump without having to remove the pump from the chemical feed system.

Pulsation Dampeners smooth the liquid pulsations caused by positive displacement pumps. This provides a smoother, more even injection of chemical into the process stream and reduces the possibility of damage to the pumping system.

Gauge Isolators provide pressure indication of the chemical injection line while isolating the gauge from the chemical through the use of a diaphragm. An optional pressure switch can alert an operator of an over-pressure situation.

Injection Quills mount easily at the injection point of a process. In addition to providing the injection point the quill acts as a check valve to assure that process fluid cannot flow back into the chemical feed system.

Check Valves provide reliable protection against back-flow of fluids in a chemical feed system.

Foot Valve with Strainer keeps solids from entering the intake line and protects against back-flow of fluids in a chemical feed system.



2.0 Back Pressure Valves

Generally, the back pressure valve can be installed anywhere in the discharge line, provided there is some downstream pressure at the dosage point. If there is no downstream pressure the back pressure valve should be installed at the dosage point to prevent siphoning and drainage of the chemical line.

All Sigmamotor back pressure valves are factory set to 50 psi (or the pressure specified when ordering). Field adjustment is possible with the adjustment screw under the screw-off cap (see chart at right).

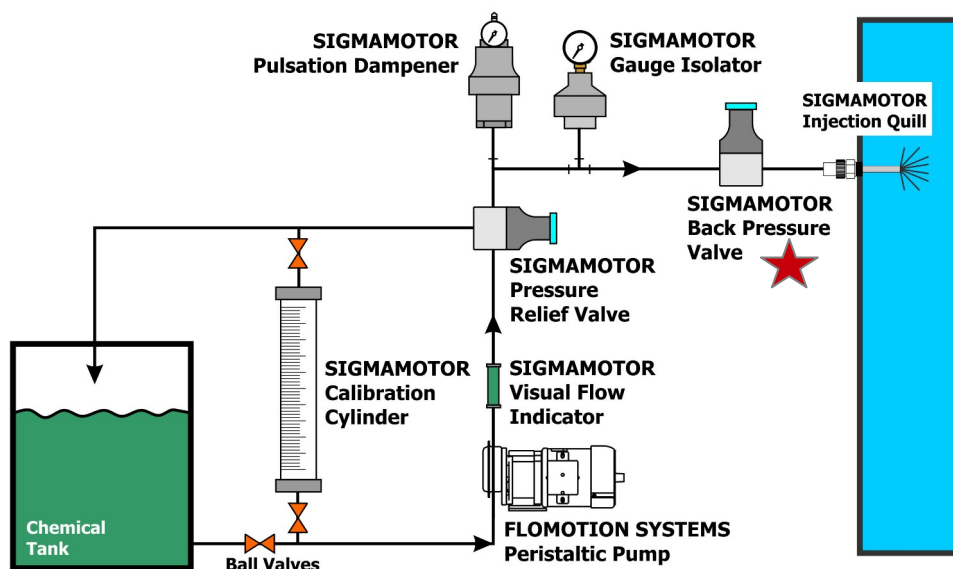
PRESSURE ADJUSTMENT

SIZE (in)	RANGE (psi)	PSI Per Revolution
1/4, 3/8, 1/2 Mini	0-50	4
	5-150	12
	50-350	30
1/2, 3/4, 1	0-50	2
	5-150	6
	50-350	18
1-1/2, 2	0-50	5
	5-150	5
	50-350	5

Back pressure valve performance will be enhanced with the installation of a pulsation dampener to smooth out the discharge / suction cycles of the pump. Thus, the diaphragm is free to float inside the valve chamber, minimizing the wear on the stress points of the diaphragm. Pulsation dampeners will also reduce the pressure drop across the valve by reducing peak flows. Back pressure valves should be installed downstream of the dampener. Consult with your pump manufacturer to get their recommendations for the correct pulsation dampener size.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
Maximum Temperature:	140 °F	195 °F	195 °F	285 °F	480 °F	300 °F

TYPICAL INSTALLATION



3.0 Pressure Relief Valves

Installation should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. Direction of flow must be across the valve; however the side of entry is not important.

All Sigmamotor Pressure Relief Valves are factory set to 65 psi (or the pressure specified when ordering). Field adjustment is possible with the adjustment screw under the screw-off cap (see chart at right).

PRESSURE ADJUSTMENT

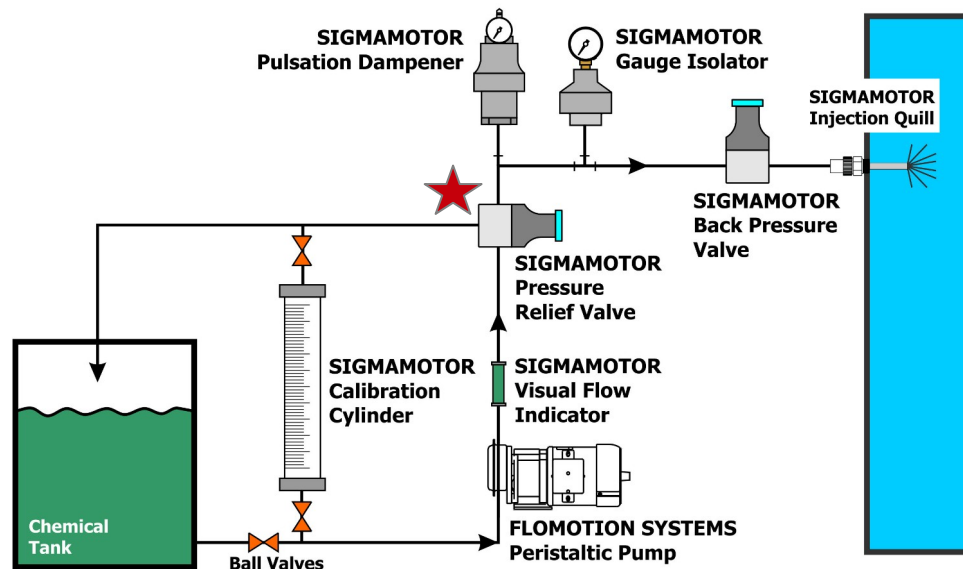
SIZE (in)	RANGE (psi)	PSI Per Revolution
1/4, 3/8, 1/2 Mini	0-50	4
	5-150	12
	50-350	30
1/2, 3/4, 1	0-50	2
	5-150	6
	50-350	18
1-1/2, 2	0-50	5
	5-150	5
	50-350	5

The optimum installation for the relief valve is to vent the relief port back to the chemical tank, or directly to a containment area. However if this is not possible, the relief port can be piped back into the suction side of the pump. This will apply the suction head to the relief port. To compensate, divide the NPSH by 4 and add this pressure to the relief valve setting.

Do not install a shut-off valve in the relief line.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
Maximum Temperature:	140 °F	195 °F	195 °F	285 °F	480 °F	300 °F

TYPICAL INSTALLATION



4.0 Calibration Cylinders

Operation:

Sigmamotor calibration cylinders are installed in the suction line to the chemical metering pump. Two isolating valves, (not supplied) must be installed in the suction line as per the drawing below. The top of the cylinder should be vented back to the storage tank or to drain.

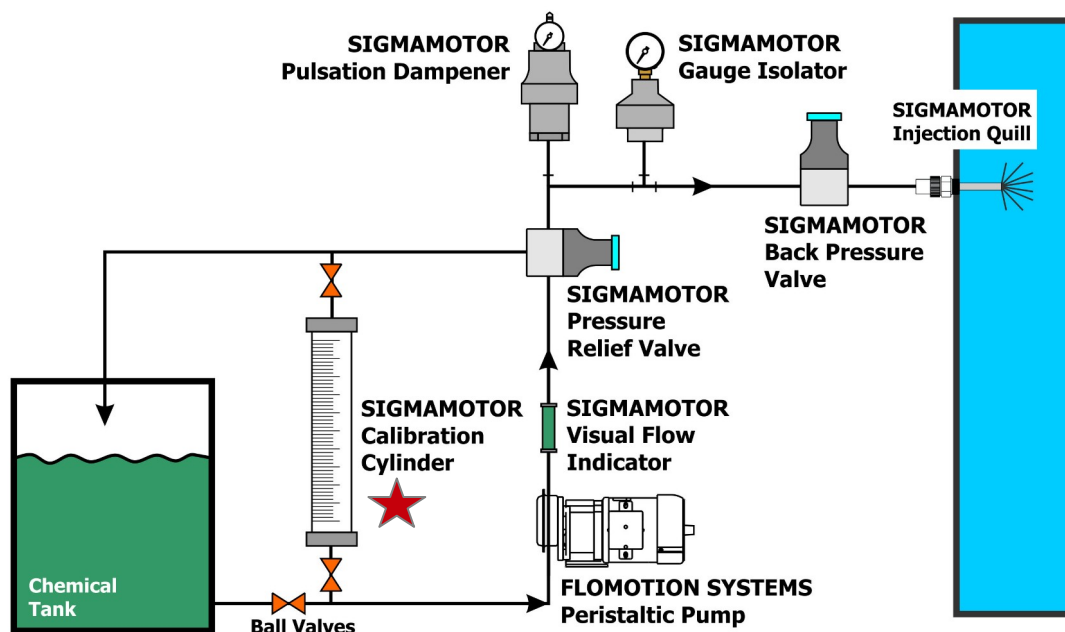
Fill the cylinder to the top mark then close the valve from the chemical tank. Switch on the chemical feed pump and draw down the chemical in the cylinder for 30 seconds. Switch the pump off. The reading on the right side of the cylinder is a direct readout of US GPH.

Alternatively, observe the volume withdrawn on the ml scale. To convert to LPH or GPH use this formula: $LPH = (\text{volume} \div \text{draw time}) \times 3.6$ $GPH = (\text{volume} \div \text{draw time}) \times 0.952$

Note: Max. cylinder pressure is 15 psi.



TYPICAL INSTALLATION



5.0 FL Series Pulsation Dampener

Mounting

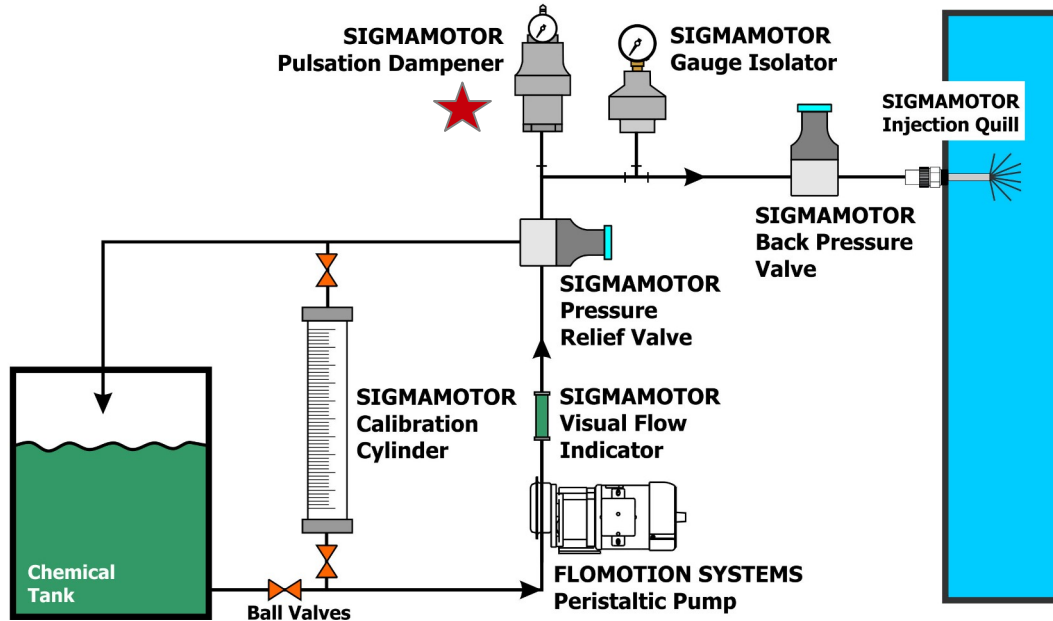
Mount the FL Series Dampener as close to the pump discharge as possible to absorb the pulses at its source. The pulsation dampener will optimally perform if mounted at the first 90° turn in the discharge piping. If using a flexible connector from the pump to your point of discharge, the dampener should be hard piped to the pump discharge manifold, then continue with flexible tubing from the dampener. Since pressure is equal in all directions, the dampener can be installed in any position. However, the recommended orientation is vertical.

Charging and Start Up

Before starting the pump, charge the dampener with air or nitrogen to approximately 70 to 85% of expected system pressure, to a maximum of 150 PSI. Start the pump. Once normal working pressure is achieved, gradually increase or decrease the charge in the dampener by bleeding or filling through the Schrader valve on top. Allow the system to respond to each adjustment (this may take a minute or two) before continuing with any further adjustments. Generally, pulsation is most effectively minimized when the charge is 80 to 85 % of system/pump discharge pressure. Pressure should be checked periodically. Re-charge when necessary.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
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TYPICAL INSTALLATION



6.0 Gauge Isolator

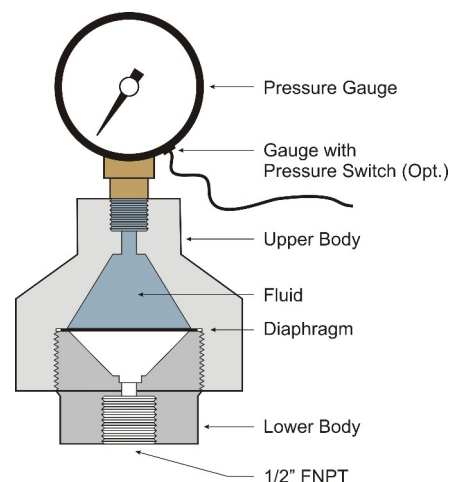
Mounting

Mount the Gauge Isolator in the pump discharge line after the Pressure Relief Valve. A 1/2" FNPT port is provided for mounting.

Pressure Switch (Optional)

The optional adjustable pressure switch can be adjusted to any pressure value between a minimum of 2% and maximum of 90% of full scale.

- Reed switch output
- Max switching capacity: 10WDC / 10VAC
- Max switching voltage: 75VDC / 50 VAC
- Max switching current: 0.5A DC or AC with resistive load
- Max switching hysteresis: 2.5%



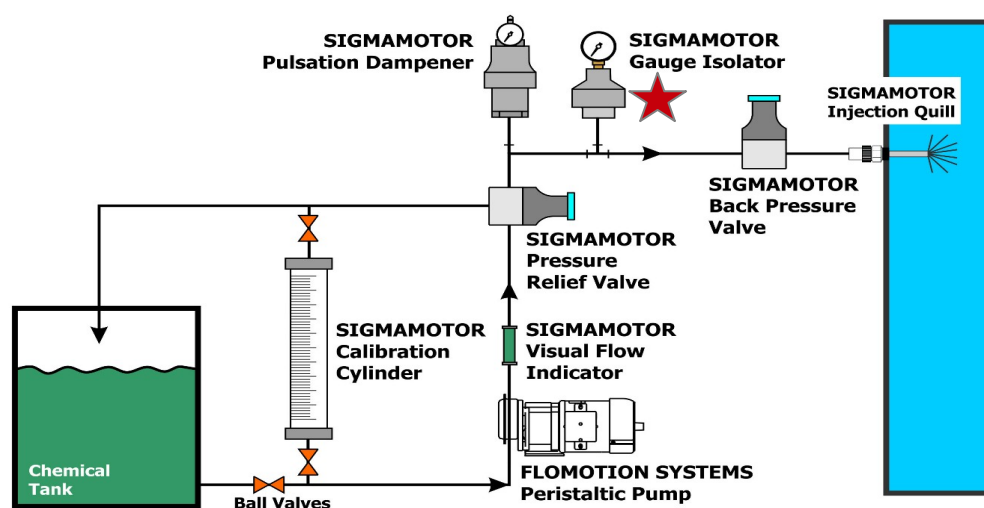
CAUTION: To prevent loss of glycerin do not remove pressure gauge.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
Maximum Temperature:	140 °F	195 °F	195 °F	285 °F	480 °F	300 °F

Adjustment

To adjust the optional pressure switch trip point remove the dial cover by turning the cover counter clockwise until it releases from the mounting tabs. Carefully move the red pointer to the desired pressure trip point. Reinstall the dial cover using care to keep the dial cover glass and gasket in the proper position for sealing.

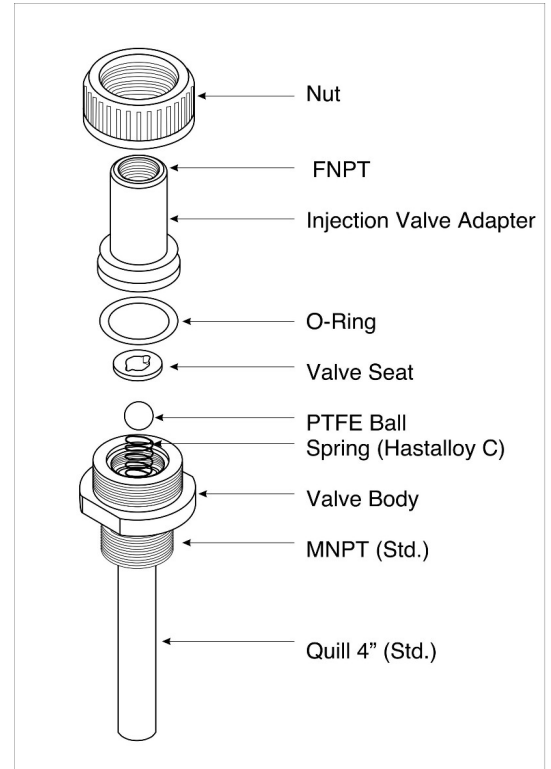
TYPICAL INSTALLATION



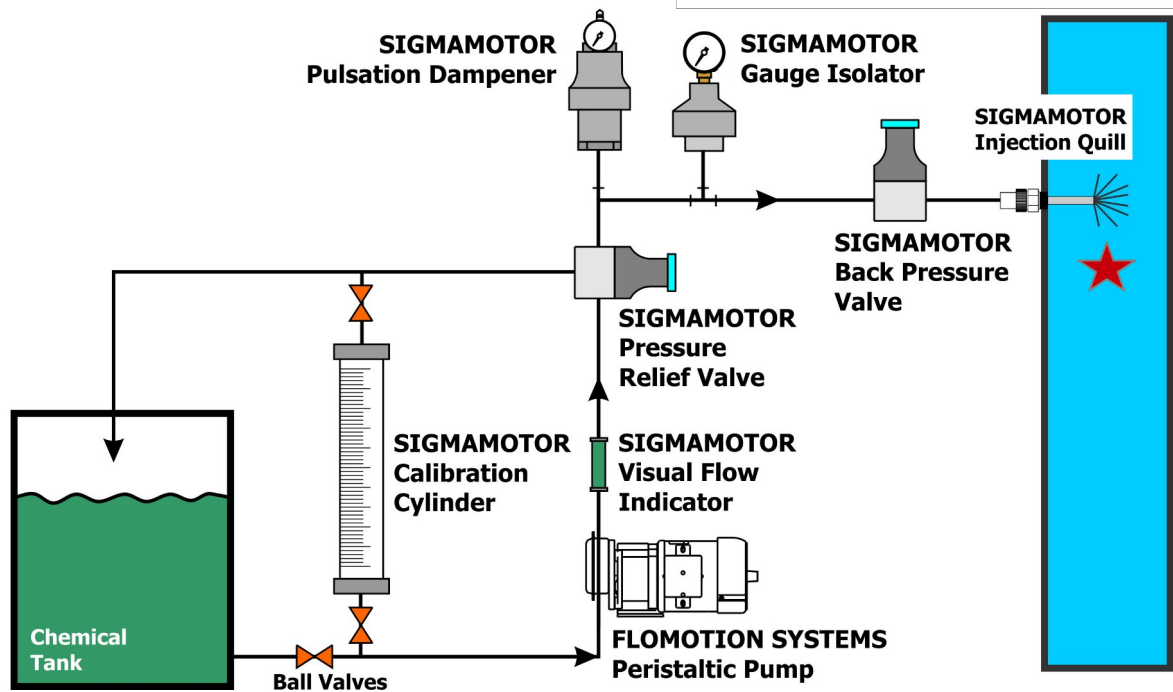
7.0 Injection Quill

Mounting

Mount the discharge end of the Injection Quill into the process stream using the MNPT process connection. Connect to your pumping system with the FNPT inlet connection.



TYPICAL INSTALLATION



Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
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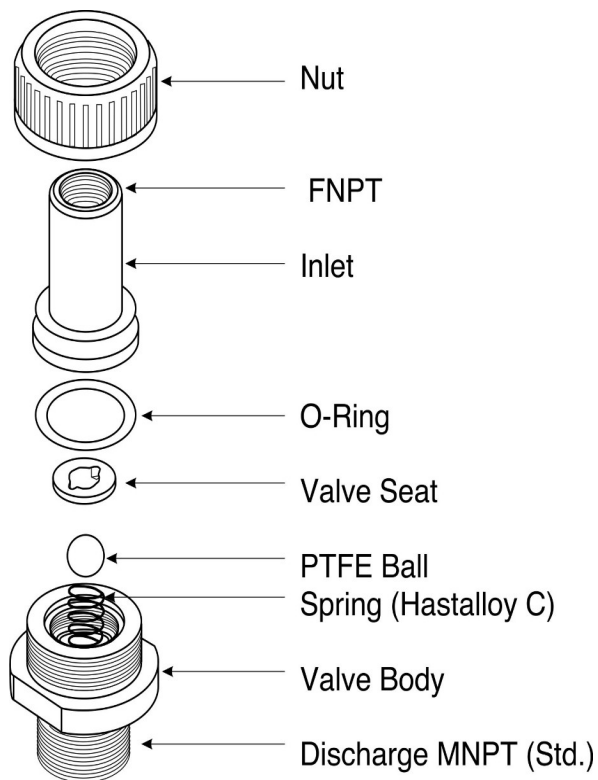
8.0 Check Valve

Mounting

Mount the discharge end of the Check Valve Quill into the process stream using the MNPT process connection.

Connect to your pumping system with the FNPT process connection.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
Maximum Temperature:	140 °F	195 °F	195 °F	285 °F	480 °F	300 °F

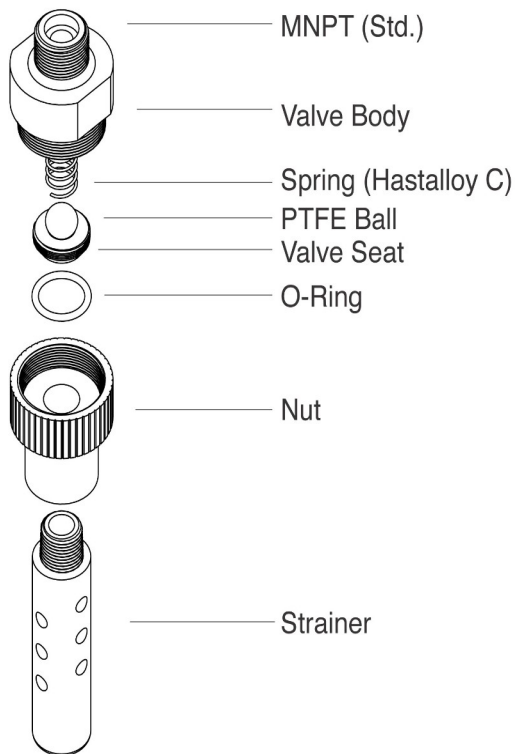


9.0 Foot Valve

Sigmamotor Foot Valves are typically installed at the bottom of a tank to prevent fluid from flowing backwards out of a chemical feed system and back into the chemical storage tank.

The integral strainer protects the pumping system by blocking large solids while providing multiple paths for the liquid to enter.

Material:	PVC	CPVC	PP	PVDF	PTFE	METAL
Maximum Pressure:	150 psi	150 psi	150 psi	150 psi	150 psi	350 psi
Maximum Temperature:	140 °F	195 °F	195 °F	285 °F	480 °F	300 °F





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Fax: 716.735.3425