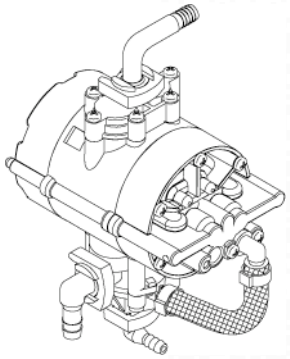
Date: *July 9, 2010*
Subject: *Beverage Gas Pump 166-269-XX*

INTRODUCTION



SHURflo's Beverage Gas Pump supplies syrup under pressure to a post-mix dispenser's valve, which mixes the syrup with water to an exact ratio (brix). The pump is used in conjunction with non-pressurized Bag-In-Box (B-I-B) containers and a bag connector (Q.D.) fitting. The pump can be operated on regulated CO2, nitrogen or compressed filtered air. The compressed gas drives the pump and is not in contact with the syrup. Separate syrup and gas chambers prevent contamination, foaming and purging of the tubing when the B-I-B has emptied.

The pump retains pressure in the outlet line, operating only when syrup is needed. When the dispenser valve is opened, the pump reacts to the pressure drop by operating to maintain pressure in the line. When the dispenser is closed, the incoming gas and output syrup pressures equalize and the pump stops. Actual dynamic line pressure is dependant upon system losses as outlined in the section "Pumping Capability".

The automatic "sold-out" feature within the pump ensures consistent syrup delivery right up to the moment the B-I-B is empty. Vacuum produced by the pump evacuates the syrup within the bag. Once the preset vacuum point is achieved, upon bag evacuation, incoming gas pressure to the pump is shutoff causing the outlet syrup pressure from the pump to drop to zero. When a new B-I-B is installed, the vacuum drops, the pump automatically restarts and pressurizes the system. The SHURflo Beverage Gas Pump ensures quality from the first drink to the last.

APPLICATION INFORMATION

Beverage Gas Pumps are intended for soda syrups and low viscosity concentrates that do not contain solids. The use of a SHURflo Juice Pump (-09) is recommended for concentrates containing soft solids, classed as round, up to 0.025 in. [0.6 mm] or that are of higher viscosity than soda syrups. When concentrates contain pulp classed as long/stringy, seed particles or are exceptionally viscous, the Particulate Juice Pump (-10) should be used as it can handle soft solids up to 1/4" [6 mm] cubed. Standard gas pump models are for installations where geographic elevation is less than 5000 ft.[1523 m]. For elevations above 5000 ft. specific high altitude models with a reduced sold-out spring rate must be used to compensate for the loss in atmospheric pressure. For further application and model information please contact SHURflo.

PUMPING CAPABILITY

The distance syrup can be delivered is limited by inherent factors (restrictions) within the inlet & outlet sides of the beverage dispensing system. Due to variances in system configuration and equipment, an accurate determination of pressure drop is difficult. Before deciding on a system's tubing size, SHURflo recommends estimating system losses by considering the following:

- Syrup viscosity and temperature (coldplate, re-circ., etc.).
- Total syrup flow rate of valve(s) connected to a pump.
- Inside diameter of the inlet/outlet tubing, fittings, bag connector, etc.
- Horizontal & vertical distance of the outlet tubing.

Vertical tubing runs will reduce total achievable tubing run length. To estimate the losses within the vertical distance, use the chart to the right. Take 1% of the distance in feet [3% if meters]. The resulting number is multiplied by the vertical distance. This product is then subtracted from the maximum horizontal distance. The resulting length is the total horizontal/vertical (horz./vert.) tubing run that is obtainable for that flow rate, tubing I.D. and viscosity.

Maximum Horizontal Tubing Lengths by viscosity

Distances shown are intended as a guideline only. (cPs = Centipose)

	Flow Rate/Sec.		¼" ID (6 mm)		3/8" ID (10 mm)		1/2" ID (13 mm)	
	Oz	mL	feet	meter	feet	meter	feet	meter
Diet Soda Syrup (5 cPs ± 3)	.5	15	500+	152+	500+	152+	500+	152+
	.75	22.5	500	152	500+	152+	500+	152+
	1.0	30	453	138	500+	152+	500+	152+
	1.5	45	212	65	500+	152+	500+	152+
	2.0	60	102	31	500	152	500+	152+
	2.5	75	64	19	398	121	500	152
	3.0	90	32	9	297	90	500	152
	3.5	105	—	—	212	65	500	152
Standard Soda Syrup (20 cPs ± 3)	.5	15	500	152	500	152	500+	152+
	.75	22.5	133	40	500	152	500+	152+
	1.0	30	79	24	388	118	500	152
	1.5	45	32	9	193	59	500	152
	2.0	60	10	3	127	39	366	112
Heavy Soda Syrup (35 cPs ± 3)	.5	15	129	39	500	152	500+	152+
	.75	22.5	75	23	345	105	500+	152+
	1.0	30	53	16	239	73	500	152
	1.5	45	26	8	127	39	425	129

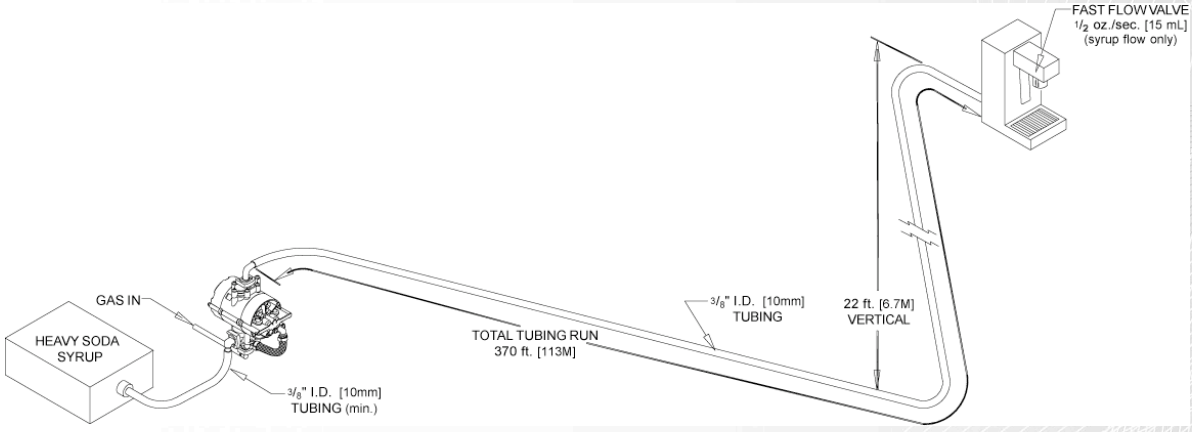
Distances shown are the results of tests conducted at 70°F (21°C) ambient with a static pressure of 85 psi. (5.8 bar) to the pump. All distances assume a dynamic pressure of 35 psi (2.38 bar) at the dispenser to maintain brix.

The chart indicates that heavy syrup with 1/2 oz./sec [15mL] flow-rate (per the illustration) can be sustained over a horizontal distance of 500 ft. [152M] when 3/8" I.D. [10mm] tubing is used.

Feet: Take 1% of 500 ft. (500 x 1%) = 5. Which then is multiplied by the 22 ft. vertical, (22 x 5) = 110 ft. Subtract this product from the 500 ft. (500 - 110)= 390. The results indicate a 390 ft. tubing run (horz./vert.) is possible, while the example only requires a distance of 370 ft.

Meters: Take 3% of 152M (152 x 3%) = 4.56. Which then is multiplied by the 6.7M vertical, (4.56 x 6.7) = 30.5M. Subtract this product from the 152M (152 - 30.5) = 121.5. The results indicate a 121.5M tubing run (horz./vert.) is possible, while the example only requires a distance of 113 m.

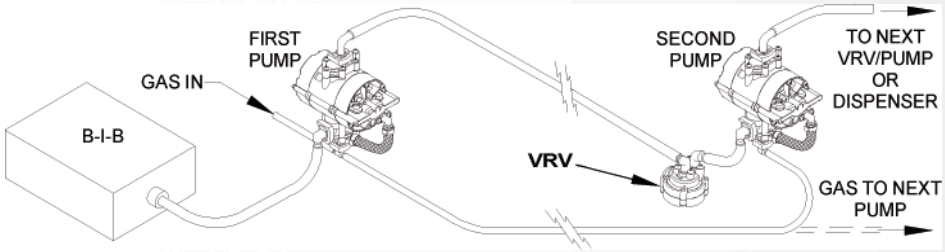
Had the example above resulted in a value that was equal to, or less than the necessary total tubing run, consider a larger I.D. tubing or installation of a pump(s) in series using a SHURflo Vacuum Regulator.



PUMPS IN SERIES FOR LONG DISTANCES

Long tubing runs or high vertical lift can be achieved by installing pumps in series. Standard SHURflo Beverage pumps are not designed to have positive pressure on the inlet side. The SHURflo Vacuum Regulating Valve (VRV) allows the pump to receive liquid from a pressurized source. By positioning a VRV at the inlet of the secondary pump, incoming pressure is reduced to zero, permitting syrup to be drawn in under vacuum.

SHURflo can recommend several other methods to meet the requirements for a particular installation, including Pressurized Inlet Pumps or Accumulators. Contact SHURflo for more information.



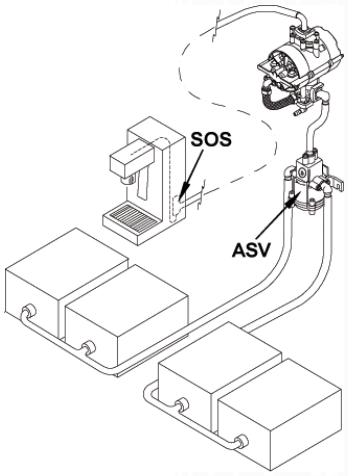
INSTALLATION GUIDELINES

- As indicated on the pump, the outlet port is to be mounted up .
- Pumps are to be mounted at the same level or higher than the B-I-B. The best choice is to have the pump above the B-I-B.
- *INLET* tubing from the B-I-B to the pump use; 3/8" I.D. [10 mm] minimum, heavy wall (1/8" [3mm]) clear, NSF listed vacuum tubing. Inlet tubing should not have excessive length. Tubing that is allowed to drape down can trap air in the B-I-B creating a potential for pump "sold-out" problems. The maximum vertical distance from the bottom of the B-I-B to the pump must not exceed 5 ft [1.5 m]. Maximum inlet tubing length is 10 ft. [3 M].
- If plumbing multiple B-I-B's to a pump, B-I-B's should be "Teed" side-by-side horizontally, rather than one on top of the other (vertically).
- *OUTLET* tubing from the pump to the dispenser should be high pressure rated and NSF listed. Consult "Pumping Capability" (page 2) for appropiate tubing I.D.
- Always cut CO2 and outlet tubing at least 2 ft. [.6 m] longer to provide a "service loop" so the B-I-B rack can be moved for cleaning or service.
- Use new (clean), 1/4" I.D. [6 mm], flexible, high pressure, braided tubing from the CO2 / air regulator to the pump NEVER connect a transfer tank "system" in series with a B-I-B system. Syrup contaminants in old components may work their way through the air supply causing premature failure of the gas pump. Gas used to operate pumps MUST be clean and contain no contaminants (syrup, oil, rust, water, etc). Air compressors may be used with proper particle filters and moisture separators. Air storage tanks should be drained regularly. Pumps subjected to contaminated air are not covered by warranty. High concentrations of CO2 can be fatal as it will displace the air from non-ventilated areas. Pumps operated by CO2 must be in ventilated areas. If placed in a confined area (basement, closet, cooler box, etc.), exhaust fans capable of changing the room air on a continuous basis should be used.
- All tubing connections must be secured with stainless steel, stepless Oetiker® clamps.
- Cable-tie all tubing securely to prevent kinks or sags that inhibit performance or cause damage to the pump fittings.

START-UP PROCEDURE

1. Confirm that all tubing connections are properly clamped, fittings are tight, and tubing is not kinked. Install bag connector to the B-I-B.
2. Adjust gas regulator to about 20 psi [1.4 bar] allowing the pump to stroke slowly.
3. Operate the valve until all air trapped within the tubing has been purged.
4. Once the air has been purged, adjust the CO2 regulator to the pressure necessary to maintain the desired brix. The most efficient gas usage occurs at 40 psi [2.8 bar]. MAXIMUM static gas pressure to the pump is 85 psi [5.8 bar], minimum 20 psi [1.4 bar]. Typical beverage standards operate @ 60-65 psi. Gas operating range is 20-85 psi.
   Flow rates that result in a stroke-rate of more than two strokes per second will decrease pump life. (Consult factory) Pump failure due to "overrunning" is not covered by the limited warranty. To prevent air from entering the system always leave the bag connector attached to the empty B-I-B until a new B-I-B can be installed. Air entered into the system, via air in the bags or vacuum leaks, may cause brix fluctuation, foaming, spitting, non-operation of the vacuum sold-out or pump "run-on" with the valve closed. Symptoms of this kind can lead to a misdiagnosis of the pump.

BEVERAGE SYSTEM ACCESSORIES



Automatic Selector Valve (ASV)

Eliminate the chore of replacing B-I-B's during peak business periods. Teeing B-I-B's together still causes them to empty at the same time. An ASV permits multiple B-I-B's to be connected to a particular pump. Once the B-I-B(s) on one side have completely emptied the ASV automatically switches sides to full B-I-B's. An ASV allows uninterrupted drink dispensing with the ability to replace empty B-I-B's at a more convenient time.

Sold-Out-Switch (SOS)

The SOS kit prevents the dispensing of syrup starved drinks by interrupting water flow at the dispenser valve. An exceptionally useful feature for lemon lime (clear) sodas and drivethru windows. The SOS senses the pressure drop in the syrup line caused by an empty B-I-B and interrupts power to the valves' electric solenoid. The SOS automatically resets with the installation of a full B-I-B.

SHURflo®