

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.


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.

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.

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 brx.	Dial Soda Syrup (5 cps ± 3)		Standard Soda Syrup (20 cps ± 3)		Heavy Soda Syrup (35 cps ± 3)		
	Flow Rate [1/4" I.D. / sec. [1.3m m.] (CPS=Centipoise)]	1/4" I.D. [6mm.]	3/8" I.D. [10mm.]	1/4" I.D. [6mm.]	3/8" I.D. [10mm.]	1/4" I.D. [6mm.]	3/8" I.D. [10mm.]
0.2	m l.	Feed	Feed	Feed	Feed	Feed	Feed
.5	15	500+	500+	500+	500+	500+	500+
.75	22.5	500	500	500	500	500	500
1.0	30	453	138	500+	500+	500+	500+
1.5	45	212	65	500+	500+	500+	500+
2.0	60	102	31	500	500	500	500
2.5	75	64	19	398	121	500	500
3.0	90	32	9	297	90	500	500
3.5	105	—	—	212	65	500	500
4.0	120	—	—	—	—	500	500
4.5	135	—	—	—	—	500	500
5.0	150	—	—	—	—	500	500
5.5	165	—	—	—	—	500	500
6.0	180	—	—	—	—	500	500
6.5	195	—	—	—	—	500	500
7.0	210	—	—	—	—	500	500
7.5	225	—	—	—	—	500	500
8.0	240	—	—	—	—	500	500
8.5	255	—	—	—	—	500	500
9.0	270	—	—	—	—	500	500
9.5	285	—	—	—	—	500	500
10.0	300	—	—	—	—	500	500
10.5	315	—	—	—	—	500	500
11.0	330	—	—	—	—	500	500
11.5	345	—	—	—	—	500	500
12.0	360	—	—	—	—	500	500
12.5	375	—	—	—	—	500	500
13.0	390	—	—	—	—	500	500
13.5	405	—	—	—	—	500	500
14.0	420	—	—	—	—	500	500
14.5	435	—	—	—	—	500	500
15.0	450	—	—	—	—	500	500
15.5	465	—	—	—	—	500	500
16.0	480	—	—	—	—	500	500
16.5	495	—	—	—	—	500	500
17.0	510	—	—	—	—	500	500
17.5	525	—	—	—	—	500	500
18.0	540	—	—	—	—	500	500
18.5	555	—	—	—	—	500	500
19.0	570	—	—	—	—	500	500
19.5	585	—	—	—	—	500	500
20.0	600	—	—	—	—	500	500
20.5	615	—	—	—	—	500	500
21.0	630	—	—	—	—	500	500
21.5	645	—	—	—	—	500	500
22.0	660	—	—	—	—	500	500
22.5	675	—	—	—	—	500	500
23.0	690	—	—	—	—	500	500
23.5	705	—	—	—	—	500	500
24.0	720	—	—	—	—	500	500
24.5	735	—	—	—	—	500	500
25.0	750	—	—	—	—	500	500
25.5	765	—	—	—	—	500	500
26.0	780	—	—	—	—	500	500
26.5	795	—	—	—	—	500	500
27.0	810	—	—	—	—	500	500
27.5	825	—	—	—	—	500	500
28.0	840	—	—	—	—	500	500
28.5	855	—	—	—	—	500	500
29.0	870	—	—	—	—	500	500
29.5	885	—	—	—	—	500	500
30.0	900	—	—	—	—	500	500
30.5	915	—	—	—	—	500	500
31.0	930	—	—	—	—	500	500
31.5	945	—	—	—	—	500	500
32.0	960	—	—	—	—	500	500
32.5	975	—	—	—	—	500	500
33.0	990	—	—	—	—	500	500
33.5	1005	—	—	—	—	500	500
34.0	1020	—	—	—	—	500	500
34.5	1035	—	—	—	—	500	500
35.0	1050	—	—	—	—	500	500
35.5	1065	—	—	—	—	500	500
36.0	1080	—	—	—	—	500	500
36.5	1095	—	—	—	—	500	500
37.0	1110	—	—	—	—	500	500
37.5	1125	—	—	—	—	500	500
38.0	1140	—	—	—	—	500	500
38.5	1155	—	—	—	—	500	500
39.0	1170	—	—	—	—	500	500
39.5	1185	—	—	—	—	500	500
40.0	1200	—	—	—	—	500	500
40.5	1215	—	—	—	—	500	500
41.0	1230	—	—	—	—	500	500
41.5	1245	—	—	—	—	500	500
42.0	1260	—	—	—	—	500	500
42.5	1275	—	—	—	—	500	500
43.0	1290	—	—	—	—	500	500
43.5	1305	—	—	—	—	500	500
44.0	1320	—	—	—	—	500	500
44.5	1335	—	—	—	—	500	500
45.0	1350	—	—	—	—	500	500
45.5	1365	—	—	—	—	500	500
46.0	1380	—	—	—	—	500	500
46.5	1395	—	—	—	—	500	500
47.0	1410	—	—	—	—	500	500
47.5	1425	—	—	—	—	500	500
48.0	1440	—	—	—	—	500	500
48.5	1455	—	—	—	—	500	500
49.0	1470	—	—	—	—	500	500
49.5	1485	—	—	—	—	500	500
50.0	1500	—	—	—	—	500	500
50.5	1515	—	—	—	—	500	500
51.0	1530	—	—	—	—	500	500
51.5	1545	—	—	—	—	500	500
52.0	1560	—	—	—	—	500	500
52.5	1575	—	—	—	—	500	500
53.0	1590	—	—	—	—	500	500
53.5	1605	—	—	—	—	500	500
54.0	1620	—	—	—	—	500	500
54.5	1635	—	—	—	—	500	500
55.0	1650	—	—	—	—	500	500
55.5	1665	—	—	—	—	500	500
56.0	1680	—	—	—	—	500	500
56.5	1695	—	—	—	—	500	500
57.0	1710	—	—	—	—	500	500
57.5	1725	—	—	—	—	500	500
58.0	1740	—	—	—	—	500	500
58.5	1755	—	—	—	—	500	500
59.0	1770	—	—	—	—	500	500
59.5	1785	—	—	—	—	500	500
60.0	1800	—	—	—	—	500	500
60.5	1815	—	—	—	—	500	500
61.0	1830	—	—	—	—	500	500
61.5	1845	—	—	—	—	500	500
62.0	1860	—	—	—	—	500	500
62.5	1875	—	—	—	—	500	500
63.0	1890	—	—	—	—	500	500
63.5	1905	—	—	—	—	500	500
64.0	1920	—	—	—	—	500	500
64.5	1935	—	—	—	—	500	500
65.0	1950	—	—	—	—	500	500
65.5	1965	—	—	—	—	500	500
66.0	1980	—	—	—	—	500	500
66.5	1995	—	—	—	—	500	500
67.0	2010	—	—	—	—	500	500
67.5	2025	—	—	—	—	500	500
68.0	2040	—	—	—	—	500	500
68.5	2055	—	—	—	—	500	500
69.0	2070	—	—	—	—	500	500
69.5	2085	—	—	—	—	500	500
70.0	2100	—	—	—	—	500	500
70.5	2115	—	—	—	—	500	500
71.0	2130	—	—	—	—	500	500
71.5	2145	—	—	—	—	500	500
72.0	2160	—	—	—	—	500	500
72.5	2175	—	—	—	—	500	500
73.0	2190	—	—	—	—	500	500
73.5	2205	—	—	—	—	500	500
74.0	2220	—	—	—	—	500	500
74.5	2235	—	—	—	—	500	500
75.0	2250	—	—	—	—	500	500
75.5	2265	—	—	—	—	500	500
76.0	2280	—	—	—	—	500	500
76.5	2295	—	—	—	—	500	500
77.0	2310	—	—	—	—	500	500
77.5	2325	—	—	—	—	500	500
78.0	2340	—	—	—	—	500	500
78.5	2355	—	—	—	—	500	500
79.0	2370	—	—	—	—	500	500
79.5	2385	—	—	—	—	500	500
80.0	2400	—	—	—	—	500	500
80.5	2415	—	—	—	—	500	500
81.0	2430	—	—	—	—	500	500
81.5	2445	—	—	—	—	500	500
82.0	2460	—	—	—	—	500	500
82.5	2475	—	—	—	—	500	500
83.0	2490	—	—	—	—	500	500
83.5	2505	—	—	—	—	500	500
84.0	2520	—	—	—	—	500	500
84.5	2535	—	—	—	—	500	500
85.0	2550	—	—	—	—	500	500
85.5	2565	—	—	—	—	500	500
86.0	2580	—	—	—	—	500	500
86.5	2595	—	—	—	—	500	500
87.0	2610	—	—	—	—	500	500
87.5	2625	—	—	—	—	500	500
88.0	2640	—	—	—	—	500	500
88.5	2655	—	—	—	—	500	500
89.0	2670	—	—	—	—	500	500
89.5	2685	—	—	—	—	500	500
90.0	2700	—	—	—	—	500	500
90.5	2715	—	—	—	—	500	500
91.0	2730	—	—	—	—	500	500
91.5	2745	—	—	—	—	500	500

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; $\frac{3}{8}$ " I.D. [10mm] minimum, heavy wall ($\frac{1}{8}$ " [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 appropriate 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), $\frac{1}{4}$ " 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].

Flowrates 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.

PUMP SANITIZING / WINTERIZING

Sanitization of the SHURflo Beverage Gas Pump is required. **The frequency of Sanitization is dependant on the concentrate type and its manufacturer's requirements.** Factors which also affect the frequency of this procedure are: temperature, concentrate volatility, facility conditions, installation and equipment. The sanitizing procedure fulfills a required 10 minute contact time with a 200 ppm Sodium Hypochlorite solution. Refer to SHURflo Service Bulletin #1025 for the N.S.F. listed sanitizing procedure for the SHURflo pump (only).

Pumps that are subjected to freezing (below 32° F [0°C]) must be purged of fluid to prevent damage. Refer to SHURflo Service Bulletin #1025 for complete winterizing procedure.

Refer to the equipment manufacturer's instructions for sanitizing and winterizing procedure for carbonators, dispensers and tubing.

Pumps that have been winterized and/or out of service for a period of time should be sanitized prior to being placed back in service.

Never apply pressure to the pump's liquid inlet. Pressurized tanks may damage internal components if used to sanitize or purge fluid from the pump (operating or not).

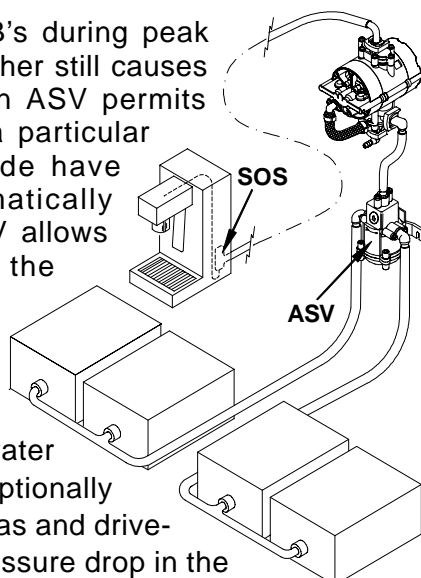
BEVERAGE SYSTEM ACCESSORIES

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 drive-thru 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.



MOUNTING CLIP KNOCKOUT REMOVAL

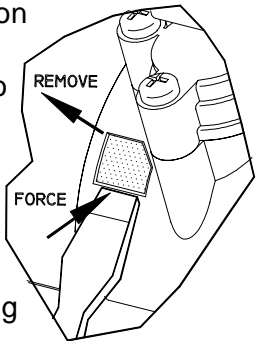
Removal of the knockout tabs from the pump housing is only necessary if the pump will be installed onto a SHURflo Mounting Board. Depending on board style, spring clip orientation varies. Ensure spring clip position and corresponding knockout tabs before removal.

The knockout tabs **must not** be pushed into the housing cavity. Failure to remove the tab from the housing will cause the spring clips not to engage completely, making the mounting insecure.

1. Position the pump on its side, in a **secure** location where the pump can be held firmly.
2. Place an appropriate sized flat blade screwdriver into the indentation as shown.

Breaking the tabs at this particular indentation facilitates complete tab removal.

3. Break the tabs loose by either pressing firmly, or striking the screwdriver handle solidly with your palm.
4. The tab should break away from the housing, allowing it to be popped-out with the screwdriver.



Removal of the aluminum mounting bracket may be required to permit full engagement of the spring clips. Screw torque 15-18 in/Lb. [17-20 N•m]

TROUBLESHOOTING

DOES NOT OPERATE / GAS APPLIED / DISPENSER VALVE OPEN

- ✓ B-I-B empty or inlet tubing pinched off activating vacuum "sold-out".
- ✓ Gas regulator over-pressurizing. (Pump stalled)
- ✓ Outlet tube kinked or restricted.
- ✓ Operated without fluid for excessive period. (Dry run)
- ✓ Transfer tube and gas lines contaminated (syrup, rust, oil, etc.) [ensure clean gas supply, change out all contaminated pumps]
- ✓ Internal damage of control cover.

OPERATES BUT WILL NOT PRIME / DISPENSER VALVE OPEN

- [consult Start-up Procedure for proper priming]
- ✓ Pump valves have no moisture/dry. [add water/syrup to the inlet port with pump stroking slowly]
- ✓ Vacuum leaks at Q.D., barb fitting clamps, or inlet fitting o-ring.
- ✓ Debris in valve seats or warped/swollen valves.

DOES NOT ACHIEVE SOLD-OUT WITH EMPTY B-I-B

- ✓ Vacuum leaks at Q.D., barb fitting clamps, or inlet fitting o-ring.
- ✓ Excessive amount of air in B-I-B from improper packaging.
- ✓ Air trapped in outlet tubing and/or pump fluid chambers.

AIR IN INLET AND/OR OUTLET TUBING

- ✓ Vacuum leaks at Q.D. o-ring or barb fitting clamps.
- ✓ Vacuum leaks at inlet fitting; o-ring pinched or missing.
- ✓ Large amounts of air noticed *only in the outlet* tubing when pump operates. [diaphragm/piston assemblies ruptured]

STROKES WITH DISPENSER VALVE CLOSED

- ✓ Air trapped in outlet tubing and/or pump fluid chambers. [open outlet and purge air, check for vacuum leaks, or air in B-I-B]
- ✓ Debris in outlet valves or warped/swollen valves.

FLUID FROM EXHAUST OR VISIBLE WITHIN GAS INLET TUBING

- ✓ Carbonator check valve.
- ✓ Ensure clean gas supply.
- ✓ Diaphragm/piston assemblies ruptured. [change out all contaminated pumps]

GAS BLOWING FROM EXHAUST CONTINUOUSLY

- ✓ Control cover subjected to contaminated gas supply or damaged. [ensure clean gas supply, change out all contaminated pumps]