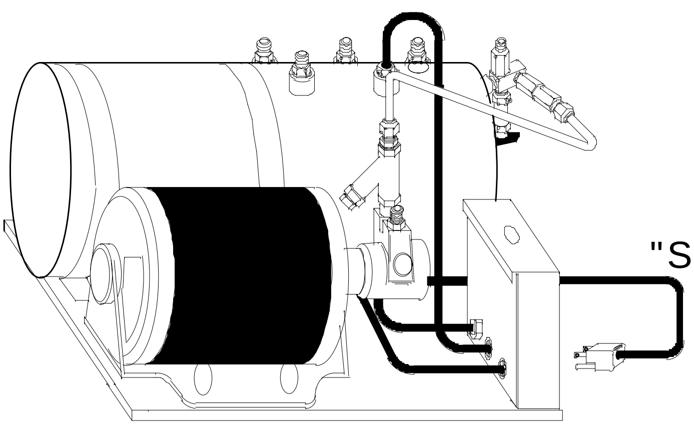
" SODA FAST "

CARBONATORS

"SF"



"SF-II-4"

INSTALLATION/INSTRUCTION MANUAL

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10/05

History of Carbonation

Water that is said to be carbonated or termed (Carbonated Water) is water that has absorbed into its void gaseous carbonic acid (Carbon Dioxide or C02).

At atmospheric pressures carbon dioxide gas is soluble in about its own bulk of water, that is one given volume of water will absorb about the same given volume of carbon dioxide gas at atmospheric pressures. The water is then said to be carbonated at say one volume (one volume carbonation). The volumes of carbonation will vary with the temperature of the water, lower temperature water will absorb a greater quantity of C02 gas as compared with water at a higher temperature.

Mineral Waters is the term applied to spring waters, which contain an excess of salts and other minerals. Some are naturally carbonated with carbon dioxide gas at about one volume carbonation. These waters date back from early times and were familiar to the Greeks and Romans. Mineral springs are located at Nieder Seltzers in Prussia (from which originated the term Seltzer water and is now applied to water that is carbonated), Saratoga, New York (referred to as Vichy water).

Mineral waters are usually classified as alkaline, saline, cholybeate, sulfurous, acidulous and aresnical. The above two springs are alkaline and contain sodium carbonate and common salt.

Soda water (also synonymous with carbonated water) received its name from the fact that in its early manufacture it was generated from sodium bicarbonate with an acid.

Artificially Joseph Priestly, an English scientist around 1773, discovered carbonated water and the first apparatus patented in 1807 by Thomas Thompson, a British chemist. Large scale manufacturing of carbonated water dates back to 1790. The carbonated soft drink industry began at Philadelphia in 1807. The first soft drink being a mix of carbonated water and fruit juice. Dr. Philip Syng Physick of Philadelphia became interested in Priestly's experiments and induced a chemist, Townsend Speakman, to prepare carbonated water for his patients. Speakman added a fruit juice as a flavor and the soft drink industry was born.

Carbon Dioxide Gas

Carbon Dioxide C02 gases exists as part of the earth's atmosphere, of which it forms about 1/2500 part. The C02 gas the earth's atmosphere absorbs scarcely seems to vary. It is a colorless gas, possessing a pleasant acidulous taste.

Carbon Dioxide is a very dense gas and its weight is heavier than that of air, so it is apparent that if a quantity of C02 gas were added to a vessel containing air, the amount of C02 gas that the air could not absorb would therefore occupy the bottom area of the vessel while the air would occupy the area above the C02 gas.

Carbon Dioxide gas is manufactured, compressed and shipped in steel or aluminum containers capable of withstanding high pressures. The gas, having been liquefied, is transferred to these shipping cylinders. The liquid (in order to allow space for expansion and assure safety) does not occupy more than 2/3 of the area of the cylinder and the gas under pressure occupies the space above the liquid.

The critical temperature of a gas is the temperature above which the gas cannot be condensed by the application of any pressure. The "critical temperature" of C02 gas is 87.88 degrees F. and the relative pressure exerted by the gas above the liquid within the closed cylinder is about 1,085 P.S.I.

With an increase in temperature of the C02 there will be a relative increase in the pressure exerted by the C02, also when the C02 temperature is decreased the pressure exerted by the C02 will be relatively reduced. Now, if the temperature of the liquefied C02 were reduced to 5 degrees F., the pressure exerted would be 346 P.S.I. At 60 degrees F. the pressure will be about 750 P.S.I.

Carbon dioxide will solidify at -69.88 degrees F. and at a pressure of about 75 P.S.I. The temperature of solid carbon dioxide (Dry Ice) at atmospheric pressure (O P.S.I.) is 110 degrees below O degrees F.

The quantity of C02 gas within the cylinders is determined by the weight of the liquefied gas. These cylinders vary in size, the standard sizes being 20 lbs. and 50 lbs. Smaller cylinders are available in stubbies of 5 lbs., 10 lbs., 15 lbs. and 30 lbs.

The carbon dioxide within the cylinder, having been compressed into a liquid, will maintain a constant pressure if the temperature remains constant, so long as any liquid remains in the cylinder. The pressure will be about 875 P.S.I. at 70 degrees F. and this pressure can only begin to fall after all the liquefied carbon dioxide has been exhausted.

It is important not to connect these cylinders in a horizontal position. The liquid carbon dioxide in a full cylinder being about 2/3 full would be discharged through the high pressure reducing valve and enter the carbonator where it will expand into a gas and could exert a pressure of over 800 P.S.I. This extremely high pressure may damage the pressure reducing regulator and cause the carbonator relief valve to open.

Saturation Point

The maximum quantity of C02 gas a given volume of water can absorb (at a given water temperature and applied C02 gas pressure) is the saturation point of water. The quantity of C02 gas absorbed by the water is measured in volumes as when (one cubic foot) of water has absorbed (three cubic feet) of C02 gas at 0 lbs. pressure, it is said to be carbonated at 3 volumes carbonation.

When water becomes saturated with C02 gas, it cannot absorb any more gas unless the C02 pressure upon it is increased or the temperature of the water is reduced.

Water that has been saturated at a given volume carbonation will, if the temperature is kept constant, remain at this saturated state indefinitely, providing the C02 pressure is kept at the saturated pressure of its corresponding temperature. Reducing the C02 pressure below the above value will maintain the water saturated but the volumes carbonation will be proportionately reduced.

VOLUME OF CO2 ABSORBED IN ONE VOLUME OF WATER

Pressure in LB. Per sq. in. g.

Temperature Degree F.	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130
32	4.0	4.3	5.2	5.8	6.3	6.8	7.4	8.0	8.6	9.0	9.7	10.3	10.9	11.3	12.2	12.7	13.3	14.5	15.7	16.8
35	3.7	4.3	4.8	5.3	5.8	6.3	6.9	7.4	7.8	8.4	9.0	9.6	10.0	10.5	11.2	11.8	12.3	13.4	14.5	15.6
40	3.4	3.7	4.3	4.8	5.3	5.8	6.3	6.7	7.3	7.6	8.3	8.6	9.2	9.5	10.1	10.3	11.3	12.3	13.3	14.2
45	3.1	3.4	3.9	4.4	4.8	5.3	5.7	6.0	6.5	7.0	7.4	7.9	8.4	8.7	9.2	9.6	10.4	11.3	12.2	13.1
50	2.8	3.1	3.6	4.0	4.4	4.8	5.2	5.5	6.0	6.7	6.8	7.2	7.6	8.1	8.5	8.7	9.7	10.5	11.3	12.2
55	2.6	3.8	3.3	3.7	4.0	4.4	4.8	5.1	5.4	6.1	6.1	6.5	6.9	7.3	7.6	7.9	8.5	9.2	10.0	10.7
60	2.3	2.5	3.0	3.4	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7	7.1	7.3	7.8	8.5	9.2	10.5
65	2.1	2.4	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.1	5.5	5.8	6.0	6.5	6.6	7.2	7.8	8.5	9.1
70	2.0	2.2	2.5	2.9	3.1	3.4	3.7	4.0	4.2	4.5	4.8	5.1	5.4	5.8	6.1	6.2	6.6	7.2	7.8	8.4
75	1.9	2.1	2.3	2.7	3.0	3.2	3.5	3.7	3.9	4.2	4.5	4.7	5.0	5.2	5.5	5.7	6.1	6.6	7.2	7.7
80	1.7	1.9	2.2	2.4	2.7	3.0	3.1	3.4	3.6	3.9	4.1	4.4	4.6	4.9	5.2	5.4	5.6	6.1	6.6	7.0
85	1.6	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.4	3.6	3.9	4.0	4.3	4.5	4.8	5.0	5.2	5.7	6.1	6.5
90	1.5	1.6	1.9	2.1	2.3	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.3	4.5	4.7	4.9	5.3	5.8	5.3
95	1.4	1.5	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4				
100	1.3	1.4	1.7	1.9	2.0	2.3	2.4	2.6	2.8	3.0	3.2	3.4	3.5	3.7	3.9	4.1				

Theory and Various Methods of Carbonating Water

Water, like all forms of matter, is composed of molecules. The molecules are in constant motion but are attracted and held together by a force similar to magnetism. The motion of these molecules is increased with an increase in temperature and decreased with a reduction in temperature.

Around these molecules there is space or voids and it is in these voids that the carbon dioxide gas becomes entrained.

When the surface of water becomes exposed to carbon dioxide gas, the water's surface exposed to the C02 gas immediately absorbs the gas. THE DEPTH TO WHICH THE GAS BECOMES ABSORBED INTO THE WATER IS VERY MINUTE BECAUSE THE MOLECULES OF THE WATER'S SURFACE BLOCK OFF AND PREVENT THE C02 GAS FROM ENTERING THE VOIDS BELOW THIS SURFACE.

Let us assume that we have a closed tank (Figure 1), that will withstand considerable pressure and this tank has fittings whereby water and C02 gas may enter the tank. Now, if we fill the tank about one half with water and supply C02 gas to the space above this water at a pressure of say 100 P.S.I., the microthin film of the water surface exposed to this gas immediately becomes carbonated to saturation or near saturation. The water below this surface is not directly exposed to the gas and therefore cannot absorb any. If this water is left exposed to the C02 gas pressure, eventually all of the water will become carbonated. This is accomplished because the molecules of water are continually in motion creating an interface of the water's surface. The time involved to carbonate the water in this manner makes it necessary to employ other means.

To carbonate water rapidly, the surface area exposed to the gas must be increased in order to reduce the time required and to reach a higher degree of carbonation. The degree to which the water becomes carbonated is also affected by the temperature of the water and the amount of gas pressure upon it.

In the past, numerous apparatus has been designed to manufacture carbonated water which employed various methods to increase the amount of water surface exposed directly to the carbon dioxide gas.

The first method employed was a tank such as explained above, but placed upon rockers so that the water within could be agitated manually.

The other methods employed to carbonate were (1) a spray nozzle along with an agitator; (2) the spray nozzle alone; (3) spray nozzle used along with baffle plates, metallic wool, glass marbles, etc. or where the C02 inlet gas is diffused up through the water by submerging a perforated metal or porous ceramic gas inlet nozzle; (4) a venturi nozzle which works on the aspirator principle. None of these methods achieved acceptable volumes required by International Carbonic Inc.

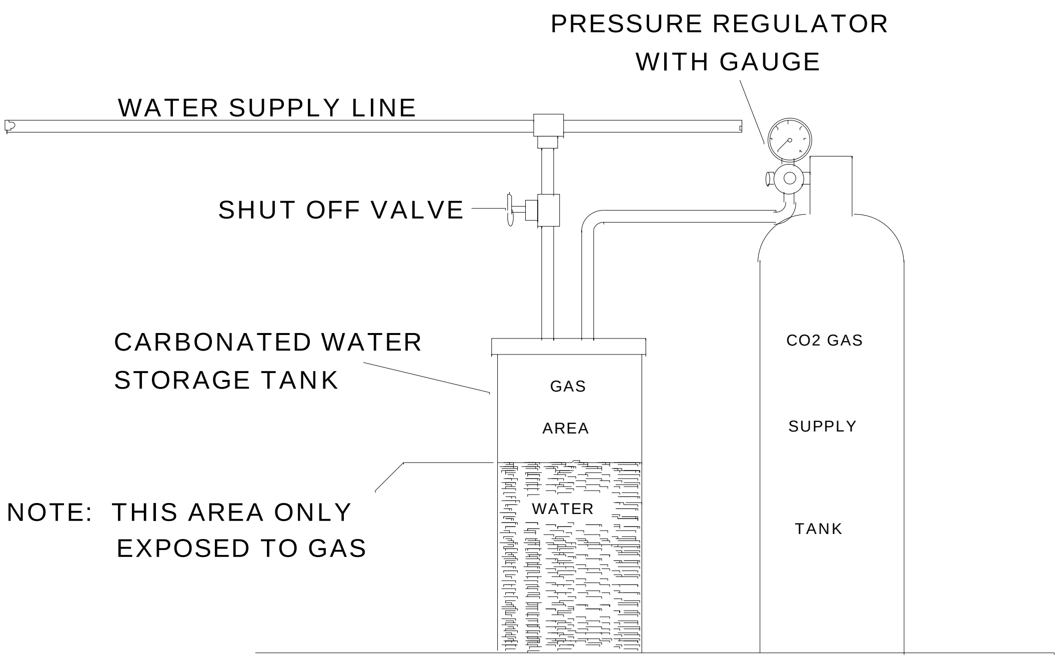


Figure 1

Explanation of Operation for SODA FAST Carbonators

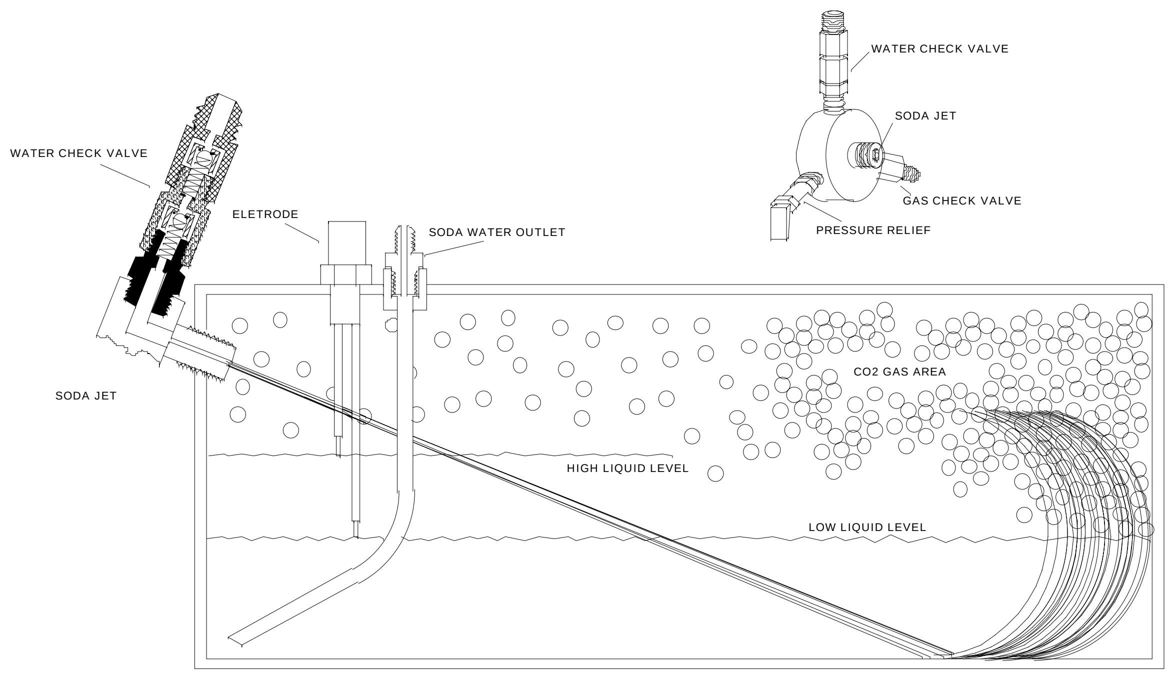


Figure 2

The SF Carbonator series utilizes a Soda Jet Recirculating Principle (Figure 2). Our Company pioneered this principle in the early 1950's. This principle produces instantaneous carbonation at extremely large capacities of 100 gallons per hour minimum.

The level of the carbonated water within the stainless steel mixing tank is used to operate the motor driven pump. The liquid level control, in conjunction with electrodes housed in the carbonator tank, control the pump motor. The motor will come on when the carbonated water within the mixing tank recedes to a predetermined low level and stops the pump motor when the carbonated water reaches a predetermined high level.

During the cycle of operation, fresh water enters the carbonator through the soda jet after passing through a short tube to the water pump inlet fittings. The water pump has impellers which drives the water through a dual check valve and then through the soda jet and into the carbonator tank.

The position and angle of the soda jet is fixed to direct an extremely high velocity solid jet of fresh water so as to impinge upon the surface of the stored body of carbonator water within the stainless steel mixing tank. The force created by this jet of fresh water entering the mixing tank causes all the water within to cascade and foamesce through the carbon dioxide gas area in a continuous recirculating-manner.

This action causes a breakdown of the surface tension of the water, forming numerous minute gas filled water bubbles. The micro thin walls of these water bubbles surrounded by gas both inside and out, offer maximum water surface for the absorption of the gas. The size opening through this jet permits large volumes of water to be carbonated.

As the incoming water is being carbonated, the level within the tank rises to contact the upper electrode, which will de-energize a relay on the liquid level control and stop the motor from turning the pump. This motor will be inactive until water within the tank recedes below the long electrode, at which time, the relay on the liquid level control will close, engaging the motor once again.

On remote carbonator pressure, it is suggested that 90 to 100 lbs. P.S.I. be used on high-pressure regulator settings. It is also important to use a water pressure regulator whenever possible. The normal settings on water regulators will vary from 25 to 40 P.S.I. It is paramount that a minimum of 25 P.S.I. differential be maintained between water and C02, i.e. C02 being the higher. If water pressure rises equal to C02 pressure, carbonation will be almost impossible to detect. As long as C02 pressure remains sufficiently higher than water, the pressure of the C02 will prevent water from entering the carbonator tank. This in turn will cause the level of the liquid inside the carbonator tank to drop, exposing the long electrode to gas.

As mentioned before, when the water level is lower than the long electrode, the motor will be energized, which in turn will turn the pump. The pump is a positive displacement pump and will pump at a greater pressure than what it is pumping against. As an example, let us assume our water pressure is 40 lbs. P.S.I. and our C02 pressure is 100 lbs. The pump will pump at the combined pressures of 40 lbs. plus 100 lbs. and an approximate 15-lb. differential, making a total pumping pressure of 155 lbs. P.S.I. This differential will vary from 15 to 25 lbs. P.S.I. Being that the pump is positive displacement, a safety has been incorporated into the pump. This relief is set at 165 lbs. with zero water pressure. The relief engagement will rise in direct relationship to water pressure.

The gas check valve is located on the carbonator tank in-between incoming C02 and carbonated water (See Figure 2). This valve prevents soda water from backing into high or low-pressure regulator systems. A malfunctioning C02 gas check valve could cause diluted syrups and contaminated C02 cylinders.

All parts of the SF Series Carbonator that come in contact with carbonated water are of stainless steel construction. The tank is constructed of 16-gauge stainless steel and is tested at over 400 P.S.I. The bursting pressure of the metal is well over this pressure.

All these numerous features are the result of many years of experimentation and have been time tested and proven in both the laboratory and the field.

The volumes of C02 gas absorbed in one volume of water within the mixing tank of all SF Carbonators at given applied C02 pressures and temperatures.

Applied C02 pressure, lb. sq. in. gauge

Temperature Degree F.

	25	35	45	55	65	75	85	95	100
32	4.0	5.2	6.3	7.4	8.6	9.7	10.9	11.3	12.2
40	3.4	4.3	5.3	6.3	7.3	8.3	9.2	9.7	10.3
50	2.8	3.6	4.4	5.2	6.0	6.8	7.6	8.1	8.5
60	2.3	3.0	3.7	4.3	5.0	5.7	6.3	6.7	7.1
70	2.0	2.5	3.1	3.7	4.2	4.8	5.4	5.8	6.1
80	1.7	2.2	2.7	3.1	3.6	4.1	4.6	4.9	5.2
90	1.5	1.9	2.3	2.7	3.2	3.6	4.0	4.3	4.5
100	1.3	1.7	2.0	2.4	2.8	3.2	3.5	3.7	3.9

Installation and, Service Instructions

When installing the Soda Fast Series Carbonator, it is important to remember that all models have a capacity of 100 gallons per hour. Therefore, it is imperative that the fresh water conduit and all the fittings connecting the fresh water line to the carbonator have not less than 3/8" passageway to prevent any serious pressure drop of the incoming water. This cannot be emphasized too strongly.

Due to the large capacity of the water pump, any restriction of the incoming fresh water supply would starve the rotary water pump of water and would create noise within the pump, poor carbonation and extremely long running time.

<u>PRIMING PUMP:</u>

After carbonator has been installed and all tubing connected, proceed in accordance with the following steps:

A. Turn on water supply.

B. Momentarily open pressure relief on carbonator tank until a spurt of water is vented from relief valve to relieve all air from tank.

C. Insert electrical cord into electrical outlet. (MAKE SURE VOLTAGE AND CYCLES OF ELECTRICAL SUPPLY ARE SAME AS REQUIRED FOR YOUR MODEL CARBONATOR)

D. Permit carbonator to run until carbonator cycles off automatically.
NOTE: Tank may be full of water, therefore motor may never come on. If system runs in excess of 30 seconds, unplug and check water supply for restrictions. The normal cycle time for an average carbonator will be 6 to 12 seconds.

<u>CARBON DIOXIDE GAS:</u>

A. Connect high-pressure regulator to C02 vessel.

B. Turn gas valve handle counter-clockwise until back seated. (All the way open)

C. Adjust high-pressure regulator to desired outlet pressure of 90 to 100 lbs. P.S.I. This is accomplished by turning adjustment screw clockwise or until desired pressure is reached.

Actuate dispenser valve until carbonator motor engages and then shuts off. Dispense valve until plain water becomes carbonated. Carbonator is now ready for use.

CAUTION: (1) Never run pump without water.

(2) Water inlet conduit should not be less than 3/8" I.D.

(3) Never subject carbonator to freezing temperatures once water has entered carbonator without forcing out all of the water and draining pump and lines.

Extreme care must be used when applying pipe thread compound to prevent the compound from entering the system and causing leaking valves in the carbonator and dispensing valves. This condition can also cause a peculiar off-taste in the carbonated water.

Extreme care must also be used to prevent the tubing filings from entering the tubing and system.

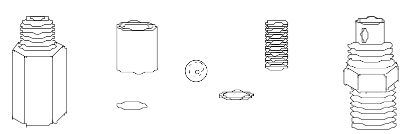
CHECK VALVES:

A valve that allows flow of liquid or gas in one direction only. The C02 gas inlet check valve is used to maintain the pressure within the carbonator when disconnecting the gas supply line from the carbonator.

The C02 gas check valve is located at the upper end of the mixing tank. This gas check is mounted higher than the water level within the mixing tank to prevent any carbonated water from entering the C02 charging line and brass regulator valve, which would cause an off-taste of the carbonated water within the carbonator.

The water and gas check valves used on the Soda Fast Carbonator have a molded "O" ring seat that will maintain its resilience and smooth seating face insuring long trouble-free operation.

See illustration for parts breakdown.



PUMP MOTOR:

The carbonator pump motor is a 1/3 H.P., single-phase type that operates at 1725 R.P.M. with 60 cycle. To operate pump, the motor will be wired to turn clockwise. It has a built-in thermal overload.

The Soda Fast line of carbonators presents a number of new features in design, construction and service resulting in economical, dependable and quiet operation.

Service in the field has been reduced to a minimum by the use of a few component parts. The essential parts consist of an electric motor, rotary pump, strainer, relief valve, stainless steel mixing tank, electrodes, liquid level control and two check valve assemblies.

ROTARY WATER PUMP:

There is no metal to metal contact between the moving parts of the rotary water pump reducing wear and insuring long life. All internal parts are made of stainless steel and hard graphite. The pump has a mechanical seal, which prevents water from leaking through the bearing and pump shaft. The seal is similar to the shaft seals that have been used in the refrigeration compressors for years.

The rotary pump has a capacity of 100 G.P.H. with a zero P.S.I. inlet and 100 P.S.I. discharge. These pumps are capable of developing discharge pressure of 400 to 500 P.S.I.

A bypass valve is built into the pump to limit the pressure that the pump will develop. The valve is adjusted for 170 P.S.I. maximum discharge pressure at a zero P.S.I. inlet. During normal operation, the pump only has to exert a pressure of 10 P.S.I. above the applied C02 gas pressure within the mixing tank. The restriction of the jet nozzle orifice (10-12 P.S.I.) plus the applied C02 gas pressure at the discharge of the pump.

The pump has a check valve incorporated in the bypass valve but serves no purpose in the operation of the carbonator. The check valve is necessary when a fresh water valve is connected to the cooling coil that is located between the pump discharge and carbonator-mixing tank. This valve permits a free flow of water through the pump while the pump is idle.

A coiled spring is inserted in the pump discharge passageway and is held in place by the discharge fitting screwed into the discharge passageway. This spring is used to limit the opening of the check valve to prevent the check valve spring from being over stretched.

<u>UN WARRANTED DAMAGE TO ROTARY PUMP:</u>

All pumps that are designed to pump water are lubricated by the water they pump. To deny a pump water is to deny it proper lubrication and damage is sure to result.

In carbonator system where the water is cooled after it leaves the pump and before it enters the mixing tank, the water in the cooling coil will freeze if the temperature of the cooling medium is too low.

A freeze up of this water cooling coil would cause the pump to open the bypass valve and recirculate water back into the pump inlet. If the pump is allowed to operate a few hours recirculating the same water, it will become overheated boiling the water out of the pump and the pump will be damaged.

The pump inlet strainer should be cleaned periodically, depending on the conditions of the hydrant water and plumbing pipes.

In some cities, the municipal water contains very fine grit that will pass through the 100-mesh screen in the strainer and collect in the pump causing the pump to lock. This condition can also be found where well water is being drawn into the carbonator pump.

A filter of the proper size, having a replaceable cartridge must be installed to prevent any grit from entering the pump. The cartridge must also be replaced whenever necessary to prevent it from becoming clogged and starving the pump of water.

During moving or storage, be sure to evacuate all water within the carbonator and pump and loosen bypass nut on side of pump to prevent freeze up and damage.

Care must be exercised whenever any part is removed or installed on a Soda Fast system to prevent foreign particles from entering the system.

CONNECTING SODA FAST SYSTEMS WHEN NO WATER PRESSURE IS AVAILABLE:

When no water pressure is available, and where the plumbing system is inadequate or the pipes are corroded reducing the opening through the pipes, a water holding tank may be installed above the carbonator pump to supply the carbonator. Water may be poured into this tank manually or a float valve can be installed in this tank to maintain a water level. This tank should have a tight fitting cover and be kept sanitary.

The rotary pump will pump water from a tank and develop its own pressure, but the water in the tank must be level with the pump or higher. If the pump has to lift the water from the tank, it must create a vacume, which will cause the pump to become objectionably noisy.

REPLACING THE ROTARY PUMP:

(V-Band Type Clamp) If it should become necessary to replace the rotary pump, it may be removed as follows:

1. Remove flare connections from water inlet and outlet of pump.

2. Loosen screw on V-band clamp.

3. Remove pump.

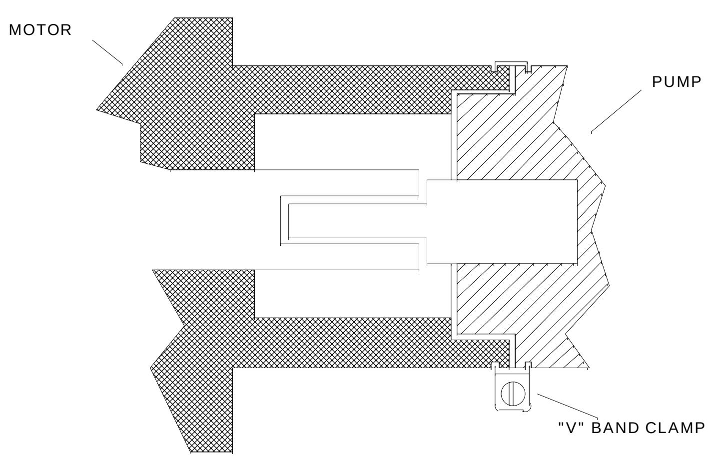


Figure 3

5. Remove 3/8 pipe x 3/8" flare connection from discharge of Pump.

6. Remove strainer assembly by unscrewing 3/8" pipe connector. The new pump may be installed by reversing the aforementioned procedure.

CAUTION: A. Be sure shoulder of pump housing and flat of pump shaft line up with the recesses provided in the motor before tightening the V-band clamp to hold the assembly together. Refer to Figure 3.

B. Prime pump properly.

LIQUID LEVEL CONTROL:

The liquid level control is a device that starts and stops the water pump motor. This electronic device is state of the art and is made with approximately 35% fewer parts than other comparable liquid level controls. The International Carbonic Inc. control also has an unheard of 3-year warranty and is rated for over a million operations.

OPERATION OF THE LIQUID LEVEL CONTROL:

110-volt electricity is transformed down to 24 volts by the transformer on the liquid level control. This 24 volts is directed to all electronic circuits. The electronic circuits have two electrodes that sense conductivity relative to ground. The carbonator and liquid level controls must be grounded with a common ground in order for liquid level control to work correctly. The logic of the control is set so when the water level inside carbonator tank lowers below the short electrode but is still in contact with the long electrode, the system will sense this condition and stay in the off position. When water level lowers below the long electrode, an electronic decision is then made to engage the relay which will in turn, turn on 110 volt motor. The motor now turns the water pump, which in turn forces water into the carbonator tank. This water mixes with C02 and the liquid level inside the carbonator tank rises. As water level reaches the long electrode, the liquid level control will sense this condition but will remain in the on position. When water level rises to the short electrode, then the message is sent to the relay to disengage, which in turn, shuts off the motor.

TROUBLE SHOOTING

IMPORTANT: Only qualified personnel should service SODA FAST Carbonators and components.

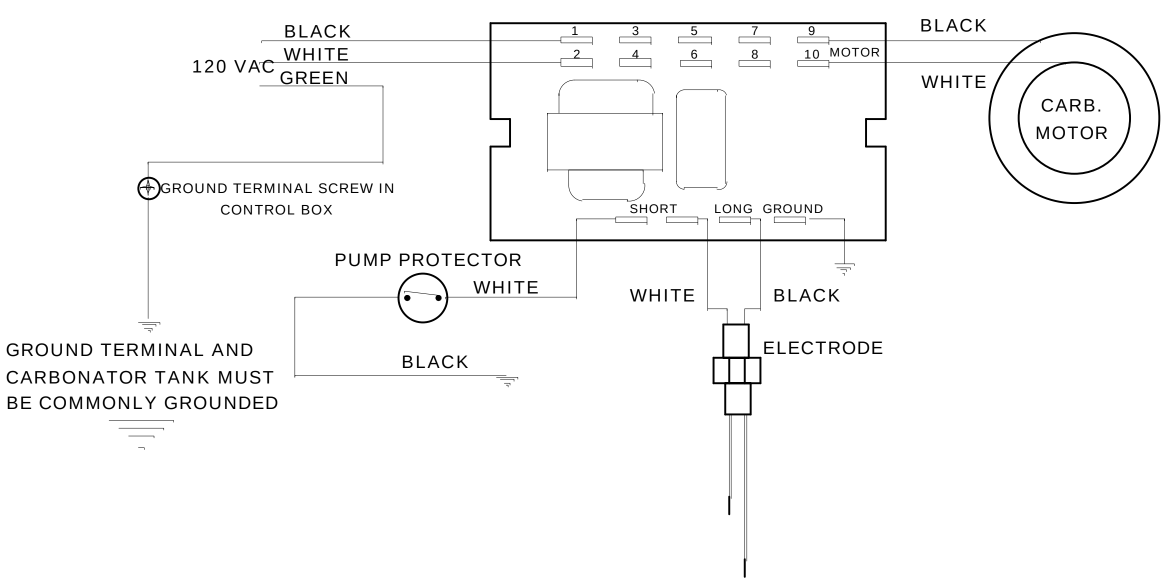
WARNING: To avoid personal injury and or property damage, always disconnect electrical power, shut off plain water and CO2 supplies before starting any repairs. If repairs are to be made to the carbonated water system, bleed carbonated water system pressure before proceeding. If repairs are to be made to syrup system, remove quick disconnects from syrup tanks, or remove QCD from BIB, then bleed system pressure before proceeding.

CARBONATOR				
Trouble		Probable Cause		Remedy
Water pump motor will not operate	1.	Inoperable water pump motor.	1.	Replace water pump motor.
	2.	Overheated motor (cut off by thermal overload protector).	2.	Check for proper line voltage. Allow motor time to cool.
	3.	Electrode inside carbonator tank defective.	3.	Replace carbonator tank electrode.
	4.	L.L.C. assembly Inoperable.	4.	Replace L.L.C. assembly.
	5.	Loose electrical connec- tion and/or open electrical circuit.	5.	Tighten connection and/or repair open circuit. Check line voltage.
Water pump motor will not shut off	1.	Defective water pump.	1.	Replace water pump.
	2.	Electrode inside carbonator tank defective.	2.	Replace carbonator tank electrode.
	3.	L.L.C. assembly inoperable.	3.	Replace L.L.C. assembly.
	4.	Loose electrical connection and or open electrical circuit.	4.	Tighten connection and or repair open ground circuit.
	5.	Carbonated water leak.	5.	Find and repair leak.
Water Pump motor will not shut off and pressure relief engaged	1.	Electrode inside carbonator does not sense ground.	1.	Replace defective electrode or check and tighten ground connection at control box.
	2.	L.L.C. assembly inoperable.	2.	Replace L.L.C. assembly.

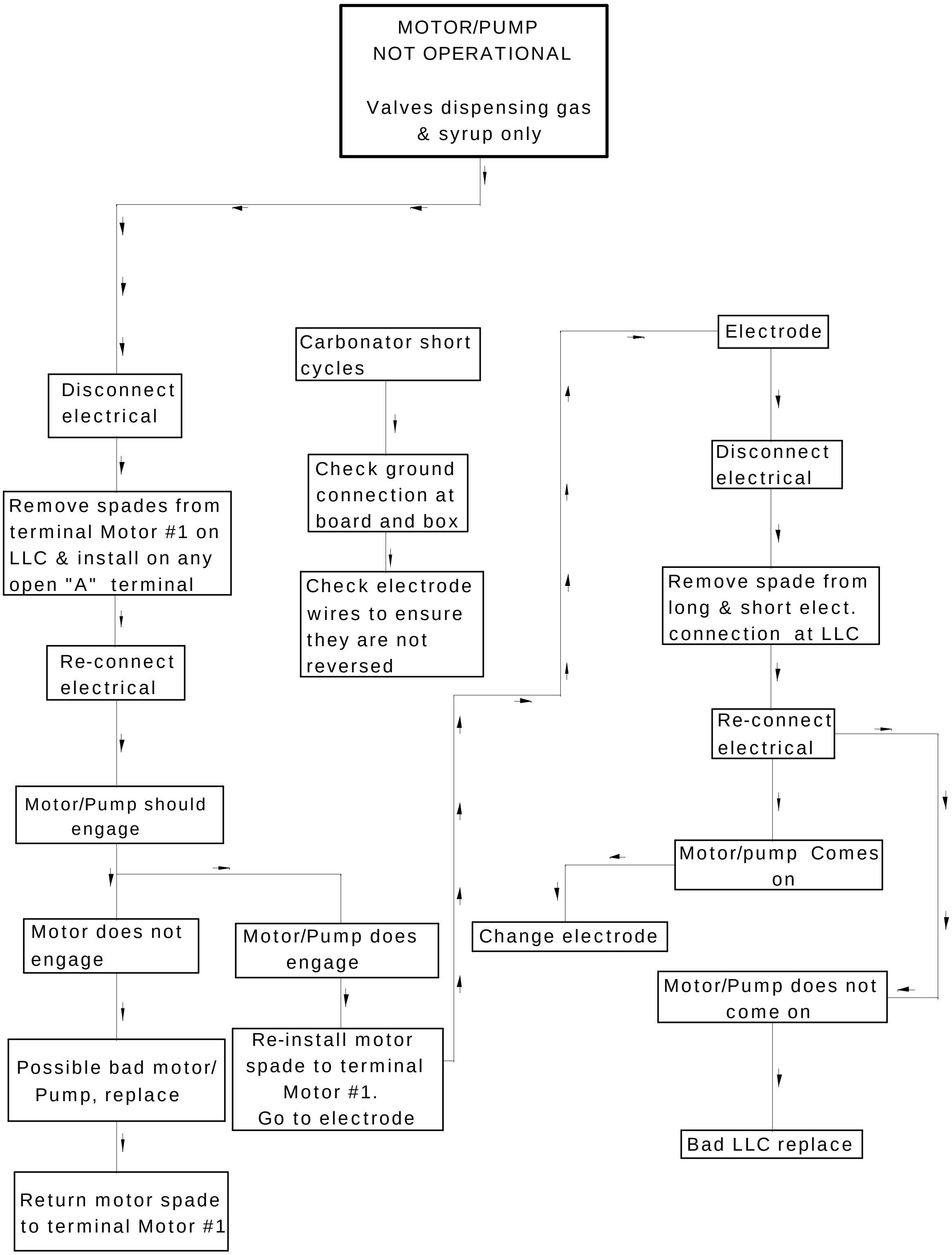
Short cycling of water pump motor	1.	Ground connection loose or disconnected.	1.	Attach or tighten ground connection.
	2.	Electrode inside carbonator tank defective.	2.	Replace carbonator tank electrode.
	3.	Carbonated water leak in system.	3.	Repair carbonated water leak.
	4.	L.L.C. assembly inoperable.	4.	Replace L.L.C. control assembly.

Water pump capacity to low	1.	Inlet water volume supply to low.	1.	Increase diameter of supply line, install holding tank.
	2.	Water pump worn out.	2.	Replace water pump.
	3.	Kinked or restricted water supply line.	3.	Clear or replace restricted water supply line.
	4.	Foreign object in water pump or restriction to water pump.	4.	Clear restrictions and check pump strainer for debris.

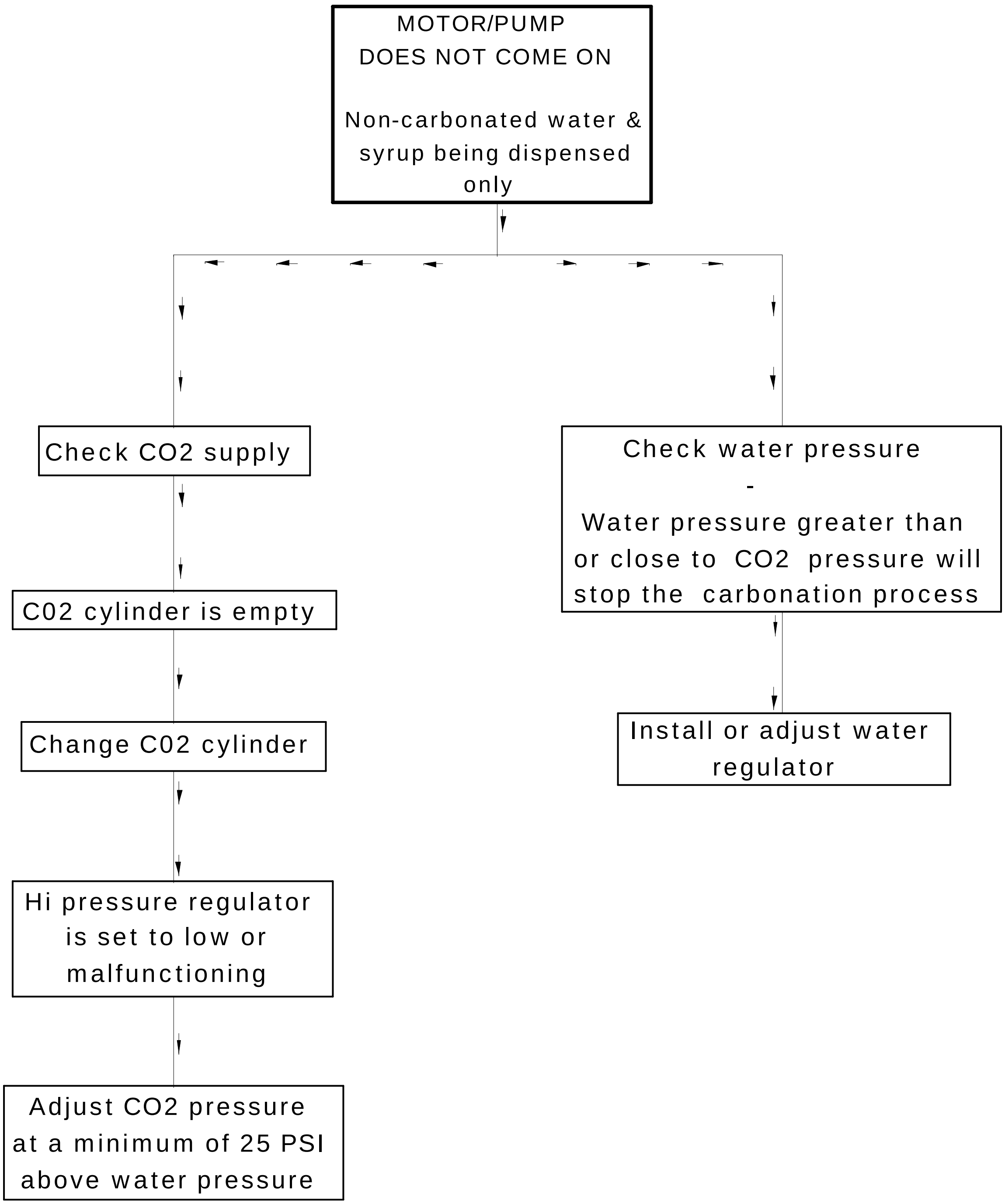
Water pump operates but water pump does not pump	1.	Water supply to low or turned off.	1.	Inlet water supply must be a minimum of 3/8”.
	2.	Inoperative water pump.	2.	Replace water Pump.
	3.	Water supply filter clogged.	3.	Replace filter.
	4.	Water pump strainer clogged.	4.	Clean water pump strainer.



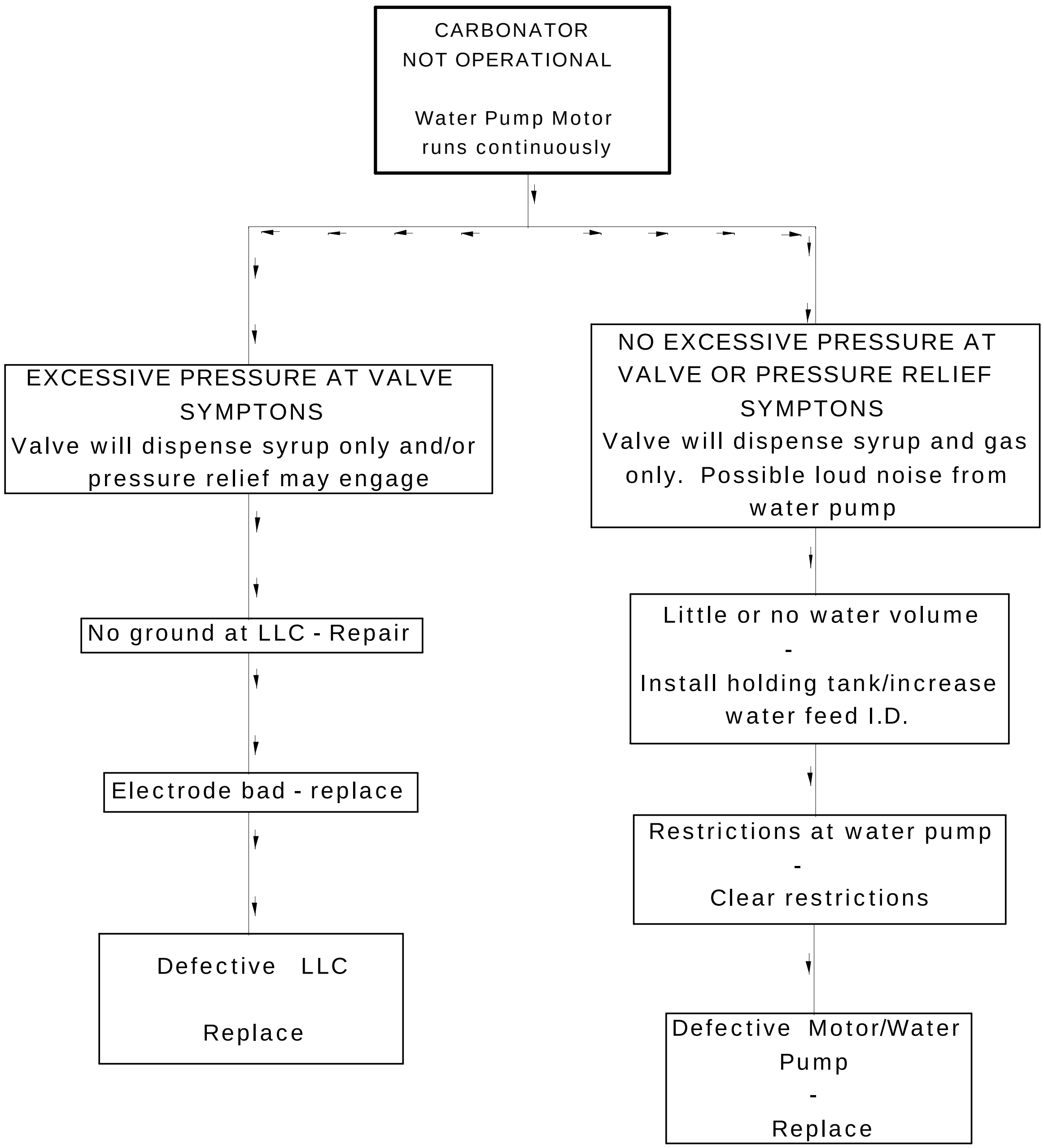
CARBONATION TROUBLE SHOOTING FLOW CHART #1

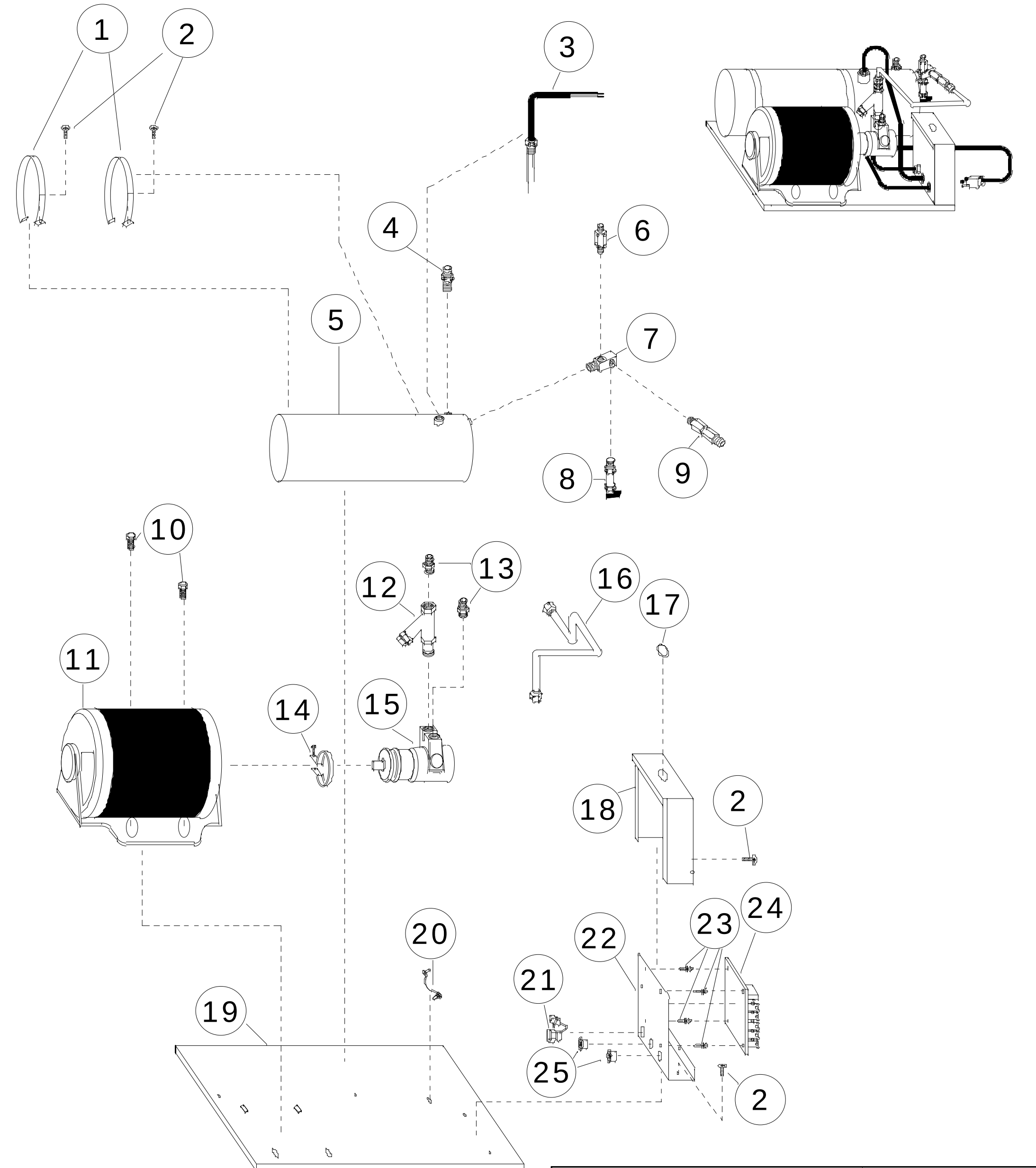


CARBONATION TROUBLE SHOOTING FLOW CHART #2



CARBONATION TROUBLE SHOOTING FLOW CHART #3

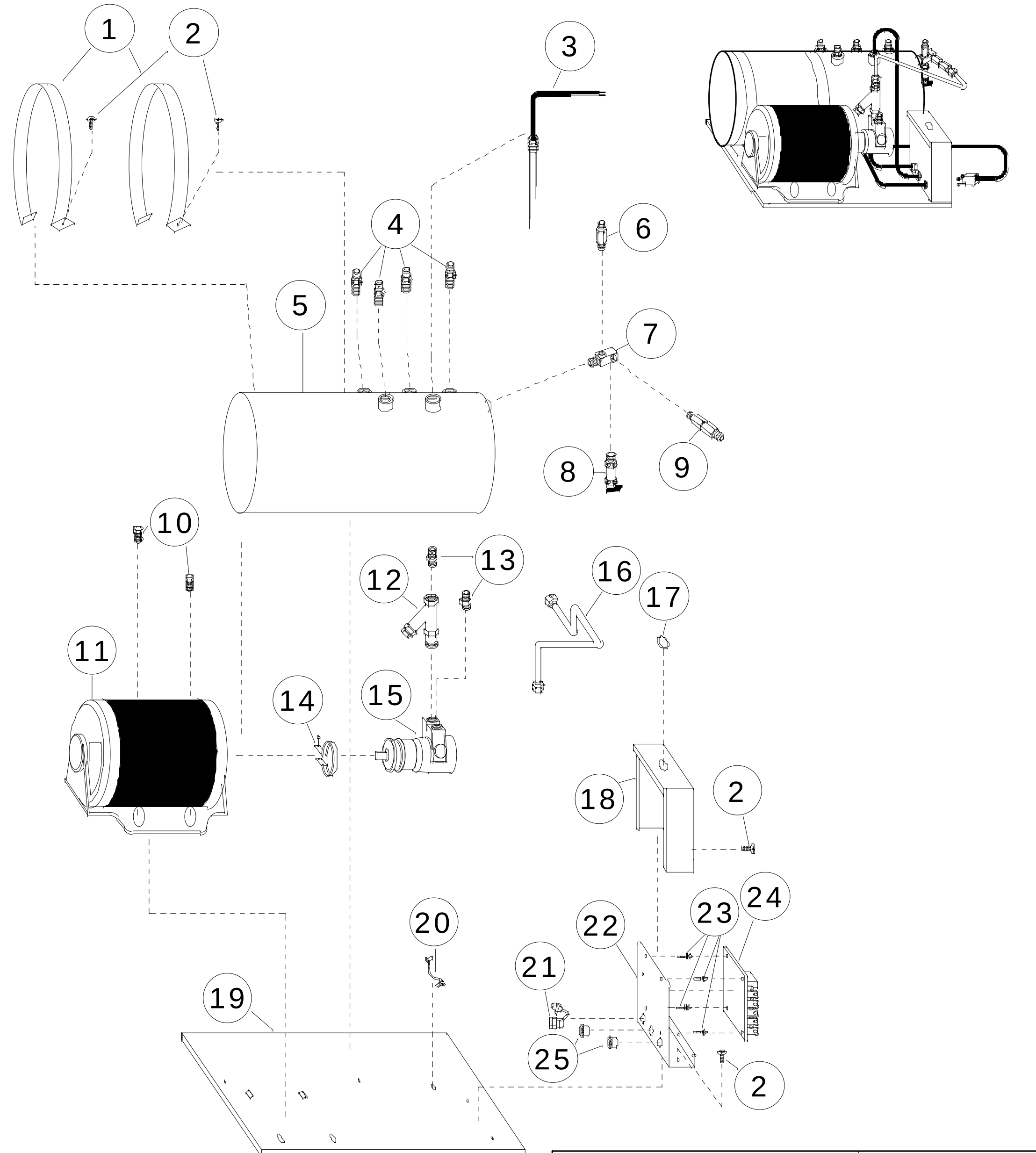




INTERNATIONAL CARBONIC INC.	TITLE	SF Soda Fast
ICI	DRN. BY	GLW
	DATE	7/13/98
	CHK. BY	JGS
ADELANTO, CALIFORNIA	APPR. BY	GLW

SF CARBONATOR

SYM	QTY	PART NO.	DESCRIPTION
1	2	S-27-4	STRAP, TANK, 4"
2	4	A-49	SCREW, 8-32 X 3/8 T.H. PHILLIPS, TYPE "F"
3	1	S-73	SENSING PROBE ASSY, LLC
4	1	S-291	HALF UNION, S.S., 1/4 M.P. X 1/4 M.F.
5	1	S-62	TANK ONLY, 4" HORIZONTAL
6	1	S-22	VALVE, SINGLE CHECK, GAS
7	1	S-29	TEE, OFFSET, S.S.
8	1	S-215	RELIEF VALVE, TOGGLE
9	1	S-20	VALVE, DOUBLE CHECK, WATER
	1	S-262	ITEMS 4 THROUGH 9
10	1	A-50	1/4-20 X 1/2 SELF TAPPING
11	1	S-96	MOTOR, 1/3 H.P.
12	1	S-650	STRAINER, WATER, "Y" TYPE
13	1	S-594	HALF UNION, BRASS, 3/8 M.P. X 3/8 M.F.
14	1	S-106	CLAMP, V-BAND
15	1	S-200	PUMP, CARBONATOR, 100 G.P.H.
16	1	S-571	CHARGING LINE **
17	1	S-7/8	HOLE PLUG
18	1	S-48	COVER, L.L.C.
19	1	S-23	BASE, S.S., SODA FAST, FLOOR MOUNT
	1	S-43	BASE, S.S., SODA FAST, WALL MOUNT
20	1	E-642-5	STRAP, STRAIN RELIEF
21	2	E-664	STRAIN RELIEF
22	1	S-47	BRACKETT, MOUNTING, L.L.C
23	1	S-1335	TERMINAL BOARD SPACER, NYLON, 3/8
24	1	S-68-A	LIQUID LEVEL CONTROL, (LLC) W/STANDOFFS
25	4	S-46	BUSHING, UNIVERSAL
*	1	E-141-4	ELECTRICAL CORD, POWER SUPPLY, (not shown)
** SPECIFY WHEN ORDERING FOR WALL MOUNT			



INTERNATIONAL CARBONIC INC.	TITLE SF-II-4 Soda Fast 4 Outlet
ICI	DRN. BY GLW
	DATE 7/13/98
	CHK. BY JGS
ADELANTO, CALIFORNIA	APPR. BY GLW

SF-II-4 CARBONATOR

SYM	QTY	PART NO.	DESCRIPTION
1	1	S-96	MOTOR, 1/3 H.P.
2	2	S-594	HALF UNION, BRASS, 3/8 M.P. X 3/8 M.F.
3	1	S-650	STRAINER, WATER, "Y" TYPE
4	1	S-106	CLAMP, V-BAND
5	1	S-200	PUMP, CARBONATOR, 100 G.P.H.
6	1	S-571	TUBE, PUMP DISCHARGE **
7	2	S-27-5	STRAP, TANK, 5"
8	8	(- - - - -)	SCREW, 8-32 X 3/8 T.H. PHILLIPS, TYPE "F"
9	1	S-63	TANK ONLY, 5" HORIZONTAL
10	1	S-20	VALVE, DOUBLE CHECK, WATER
11	1	S-74	SENSING PROBE ASSY, LLC
12	1	S-291	HALF UNION, S.S., 1/4 M.P. X 1/4 M.F.
13	1	S-22	VALVE, SINGLE CHECK, GAS
14	1	S-2	JET, CARBONATOR
15	1	S-29	TEE, OFFSET, S.S.
16	1	S-215	RELIEF VALVE, TOGGLE
	1	S-263	TANK ASSEMBLY
17	1	S-43	BASE, S.S., SODA FAST, WALL MOUNT
18	1	S-23	BASE, S.S., SODA FAST, FLOOR MOUNT
19	1	E-642-5	STRAP, STRAIN RELIEF
20	1	S-47	BRACKET, MOUNTING, LLC
21	2	S-48	COVER, LLC
22	1	S-68-A	LIQUID LEVEL CONTROL, (LLC) W/STANDOFFS
23	1	E-664	STRAIN RELIEF
24	1	S-46	BUSHING, UNIVERSAL
25	4	S-193	FOOT, RUBBER
*	1	E-141-4	ELECTRICAL CORD, POWER SUPPLY, (not shown)

** SPECIFY WHEN ORDERING FOR WALL MOUNT

NOTE SECTION

Frequently Called Numbers:

CO2 SETTINGS:

High Pressure ______________________ PSI
Low Pressure ______________________ PSI

Product Setup:

#1

#2