UNDERSTANDING POST-MIX SYSTEMS

December 2015

Pre-mix vs Post-mix Beverages

Premix is a soft drink, a blend of syrup and water (soda or plain), that is produced with sanitary, modern equipment in bottling plants and is most commonly packaged in bottles or cans. However, it is sometimes packaged in 5 gallon stainless steel tanks and is identical in taste and mix to bottled or canned products. It is mostly used for special events where an outside water or electrical source is not readily available. Some examples are events held in parks, a state fair or outdoor festival events.

Pre-mix
Dispenser

Pre-mix
Figal Tank

Pre-mix
soft drinks

Post mix is also a blend of water (soda or plain) and syrup, however it is manufactured right on site and is usually mixed directly into a cup or glass.

The objective of this seminar is to give you a basic understanding of a post-mix systems

Post-Mix System

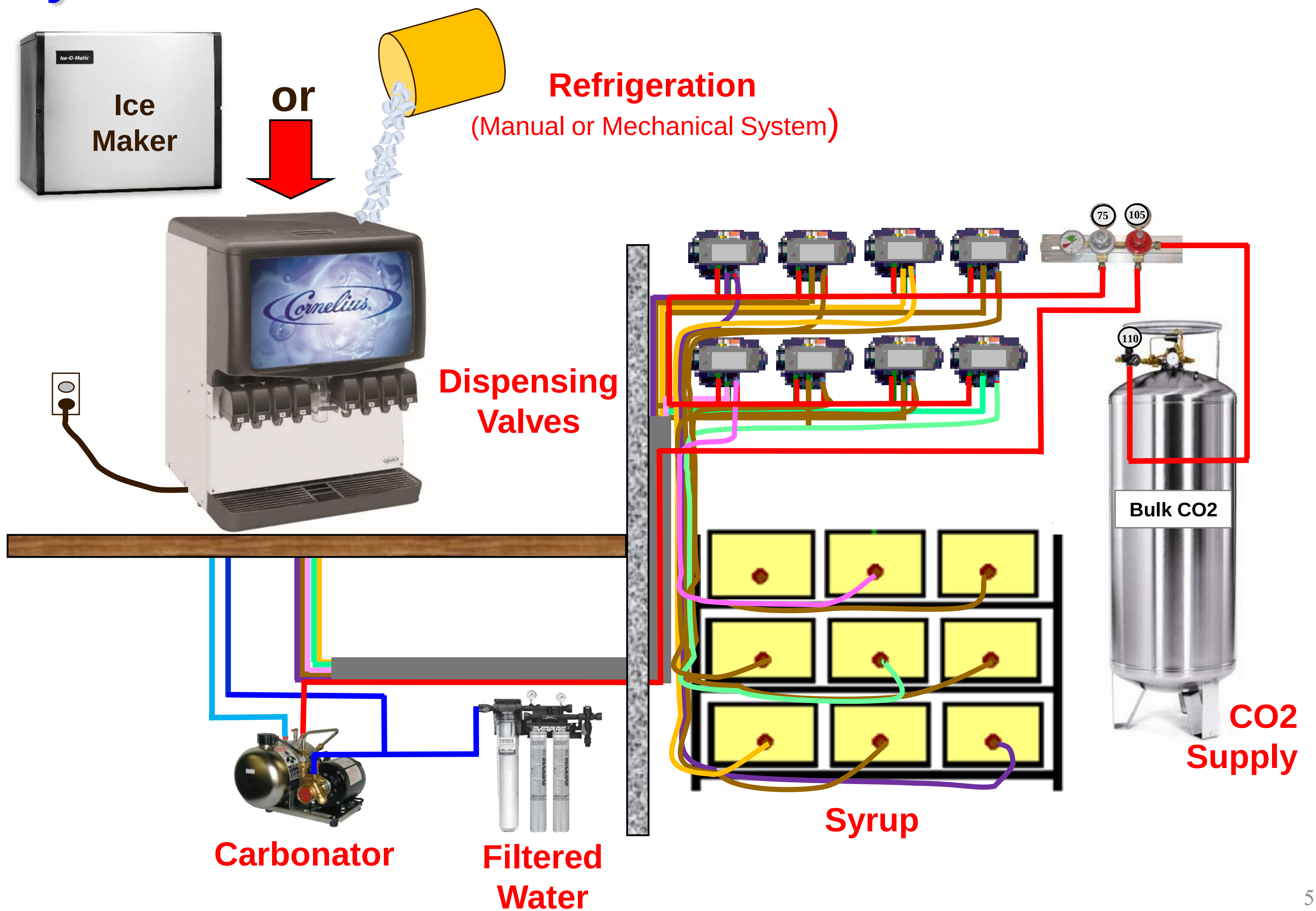
- Manufactures carbonated water
- Proportions and blends the ingredients
- Refrigerates the product and the ingredients
- Dispenses finished product at the proper flow rate

Post-Mix System

The main elements of a post-mix system are:

- **Water Supply**
- **CO2 Supply**
- **Syrup Supply**
- **Carbonation**
- **Refrigeration**
- **Dispensing Valve**

System Overview



Post-Mix System Components

Water Supply

- Shut Off Valve
- Water Filtration System
- Water Booster
- Water Flow Regulator
- Back Flow Preventer
- Carbonator

Post-Mix System Components

Water Supply

Since a soft drink is approximately 5 parts water to 1 part syrup, having an adequate, clean water supply is absolutely essential.

Areas of Focus:

- **Volume**
- **Pressure**
- **Quality**
- **Safety**

Post-Mix System Components

Water Supply

Carbonator

Volume

- Most carbonators (the component used to manufacture carbonated water) require a 100 gallon per hour water supply.
  - To assure this volume, water should fill a 5 gal bucket within 3 min’s
- A minimum 1/2” water supply line is required from the building feed to the point of connection
- A minimum of 3/8” line is required from the point of connection to the unit and carbonator
  - Copper, stainless or braided nylon supply tubing is acceptable
  - A maximum of 6 feet is recommended from supply to carbonator

Post-Mix System Components

Water Supply

Pressure

Adjustable regulator

- **High water pressure effects ability to carbonate**
  - If water pressure exceeds CO2 pressure, it will not carbonate
  - A water regulator may be necessary to control pressure
  - A maximum of 70 psi is recommended to the carbonator

Non-adjustable regulator

- **Low pressure effects both carbonated and non-carbonated beverages**
  - If the water pressure is too low, the carbonator tank may not fill
  - A water booster may be necessary to control pressure
  - A minimum of 25psi is recommended to the carbonator
  - Low water pressure can effect the ratio of non-carbonated beverages

Water Booster

Post-Mix System Components

Water Supply

Quality

Filtration System

- **Potable**
  - Dictionary Definition - *adjective*: suitable for drinking
- **Taste & Smell**
  - High sulfur or iron content can effect taste and smell of drink
  - High chlorine content may also effect taste and smell of drink
- **Filtering and Conditioning**
  - Water filters are recommended to remove unwanted silt, sand, smells and tastes from water supply
  - Water filters must be monitored and changed periodically

Post-Mix System Components

Water Supply

Safety

When carbon dioxide is mixed with water, carbonic acid, a weak acid, is formed. Post mix carbonators form such acids as they carbonate the water that is mixed with the syrups to produce a soft drink. If the acidic water is allowed to enter the building water supply, a serious condition could occur. Many soft drink locations plumb their water through copper pipes or tubing. If a copper tube comes in contact with the carbonic acid, the acid will dissolve some of the copper and could contaminate the building's water supply. Consuming this copper contaminated water could result in copper poisoning.

Copper Poisoning.

Drinking water that contains high levels of copper, could result in vomiting, diarrhea, stomach cramps, and nausea. High intake of copper could also cause liver and kidney damage, and even death. Very young children are sensitive to copper, so long-term exposure to high levels of copper water may cause liver damage and death.

Post-Mix System Components

Water Supply

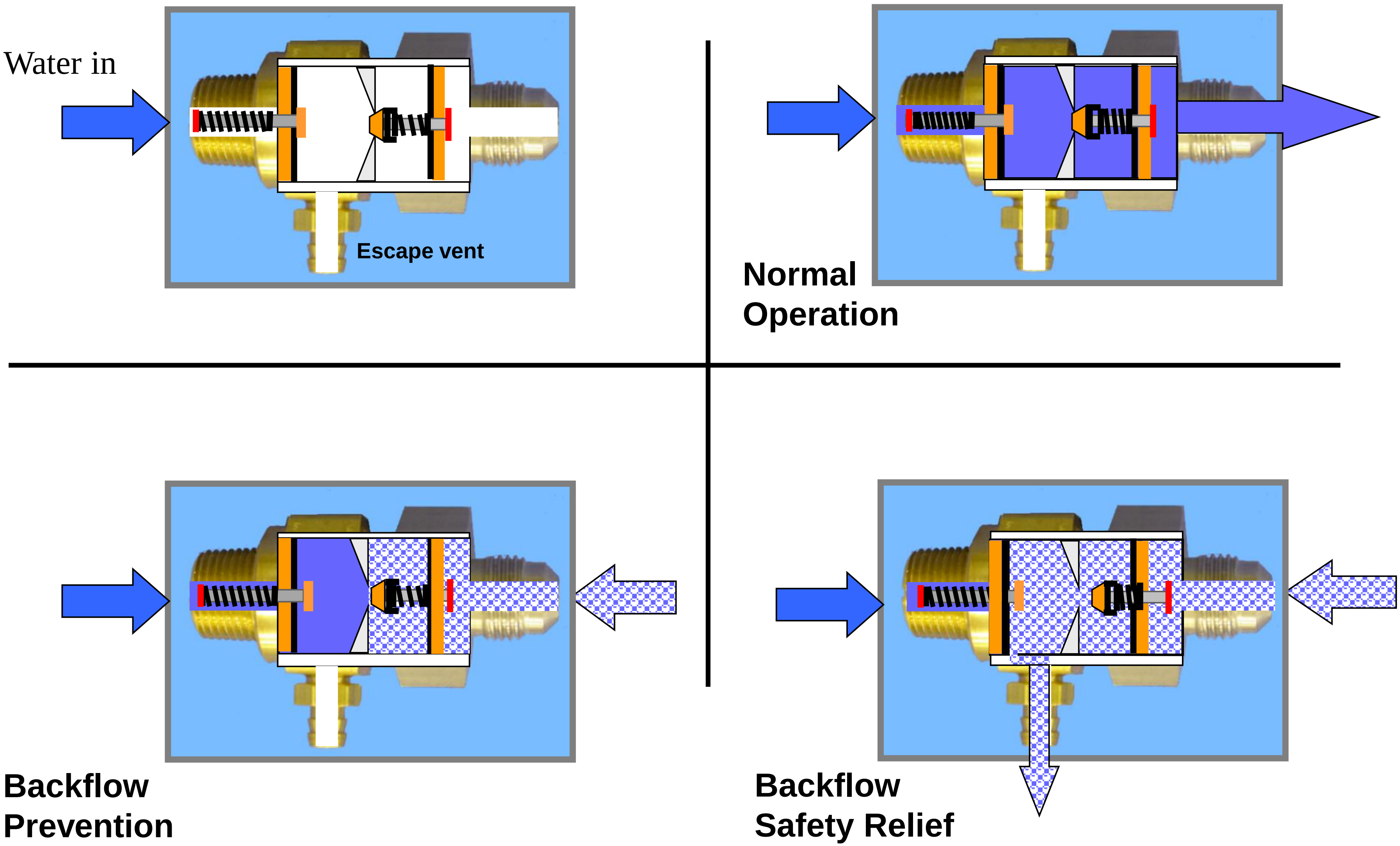
Safety

- **Backflow Preventer**

  A backflow preventer offers permanent protection against copper poisoning in a water supply system. It consists of two independent acting check valves and a atmospheric port to channel the carbonated water away from the water source. If backflow occurs, the back-pressure will cause a seat in the first check to cover water inlet orifice. In the event that the first check fails, a diaphragm in the second check lifts and directs flow to the atmospheric port where it can be plumbed to a drain.

Post-Mix System Components

Backflow Preventer Operation



Post-Mix System Components

CO_2 Supply

- CO2 Supply Delivery
- High Pressure Regulator
- Low Pressure Regulator
- Combination Regulators

CO2 Tank

CO2 Bulk System

Post-Mix System Components

CO_2 (Carbon Dioxide) Supply

The CO_2 supply performs two major functions.

- It propels the syrup from the syrup source to the valve where it mixes with water to produce a soft drink
- It is introduced and absorbed into water to produce carbonated or soda water

Areas of Focus:

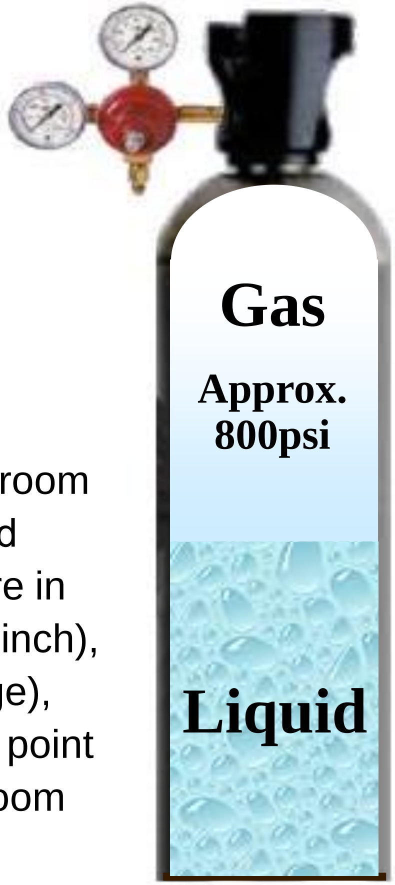
- **Container Theory**
- **Container Handling & Safety**
- **Supply Quality**
- **Pressure Regulation**

Post-Mix System Components

CO2 (Carbon Dioxide) Supply

Container Theory (Tank explanation)

- **CO_2 is stored in a tank (or bulk container)**
  - The tank is partially filled with liquid CO_2. A "full" tank usually contains about 65% liquid CO_2
  - CO_2 for a pre-mix system needs to be in a gas state
  - When compressed or pressurized, CO_2 becomes a liquid. In a tank at room temperature, some of the liquid vaporizes ("boils off"), turns into a gas and occupies space at the top of the tank. This process increases the pressure in the tank. Once the pressure reaches around 800 psi (pounds per square inch), the boiling off stops. When the pressure in the tank is lowered (CO_2 usage), the liquid begins vaporizing again to produce more gas. Since the boiling point of CO_2 is about -110 degrees Fahrenheit (below zero), normal ambient room temperatures are more than sufficient to vaporize the liquid CO_2. Room temperatures will have a major effect on the boiling process and internal tank pressure. The warmer the ambient temperature, the higher the pressure in the tank. A typical tank pressure is usually between 700 - 1200 psig.



Post-Mix System Components

CO2 Supply

Container Handling & Safety

Carbon Dioxide (CO2) is heavier than air and displaces oxygen. CO2 is a colorless, noncombustible gas with a faintly pungent odor. High percentages of CO2 may displace oxygen in the blood. Prolonged exposure to CO2 can be harmful. Exposure to high concentrations of CO2 may cause such symptoms as headache, sweating, rapid breathing, increased heart rate, dizziness, mental depression, visual disturbances, or tremors. These symptoms may be followed rapidly by a loss of consciousness and suffocation. Strict attention must be observer in the prevention of CO2 gas leaks in the entire CO2 and soft drink system. If a CO2 leaks is suspected, immediately ventilate the contaminated area and evacuate.

- **Safety precautions**
  - The tank valve has a pressure relief device "burst disk" that is designed to rupture and safely release the CO2 should the pressure rise above 1,800 to 2,500psi.
  - Keep CO2 tank cool. An extreme rise in temperature will equate to an extreme rise in pressure inside the tank.
- **CO2 tanks must be chained and stored upright**
  - A CO2 tanks is under 700 - 1200 psig of pressure and must be secured (chained) to prevent it from falling over. They also must be Inspected periodically.
  - Tanks must be stored upright so liquid CO2 will remain at the bottom of the tank.

Post-Mix System Components

CO2 Supply

CO2 Quality

There are at least three different grades of CO_2 available. Food Grade is used in beverage equipment, Industrial Grade is use in welding applications and Medical Grade for medical use.

Food Grade CO2 Specifications

Purity	99.9% v/v min.	Acetaldehyde	0.2 ppm v/v min.
Moisture	20 ppm v/v max.	Aromatic	20 ppb v/v max.
Oxygen	30 ppm v/v max.	Total sulfur (as S) excluding SO2	0.1 ppm v/v max.
Carbon Momoxide	10 ppm v/v max.	Sulfur Dioxide	1 ppm v/v max
Ammonia	2.5 ppm v/v max.	Odor of Solid CO2 (snow)	No foreign odor
Nitric Oxide/nitrogen dioxide	2.5 ppm v/v max. each	Appearance in water	No color or turbidity
Nonvolatile residue	10 ppm w/w max.	Odor and taste in water	No foreign taste or color
Nonvolatile organic residue	5 ppm w/w max.		
Phosphine	To pass test (0.3 ppm v/v max.)		
Total volatile hydrocarbons (as methane)	50 ppm v/v max. including 20 ppm v/v total non-methane hydrocarbons		

v/v Verification & Validation

Post-Mix System Components

CO2 Supply

Primary

Secondary

Pressure Regulation

Post mix systems typically require two types of CO2 regulators

- **Primary Regulator**
  - Supplies CO2 pressure to carbonator
  - Normal pressure settings are between 70 to 110 psig

- **Secondary Regulator**
  - Supplies CO2 pressure to syrup pumps or tanks
  - Normal pressure setting are between 30 to 80 psig

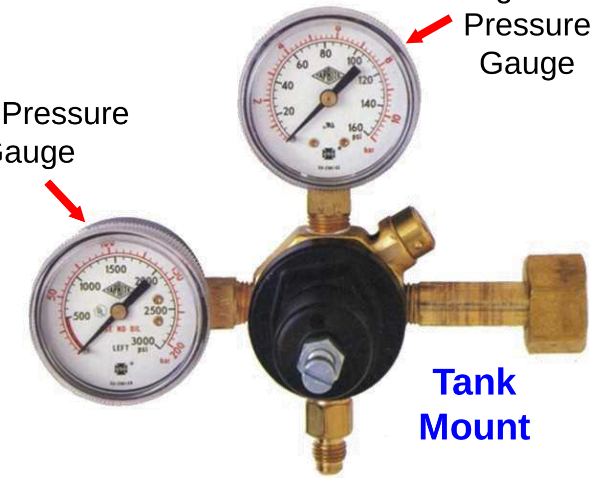
Primary & Secondary

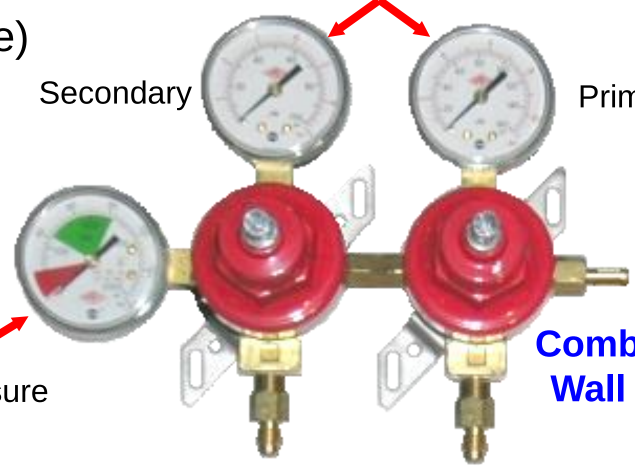
Post-Mix System Components

CO2 Supply

Pressure Regulation - Primary

- **Primary Regulator**
  - Reduces CO2 pressure from tank to working pressure
  - Can be tank or wall mounted
  - Usually includes regulated pressure gauge and tank pressure gauge (displays supply container pressure)
  - Gauge range is from 0 to 160psi or 0 to 300psi
  - Normal pressure is between 70 to 110 psig
  - Primary has a relief valve to guard against over-pressurization of system





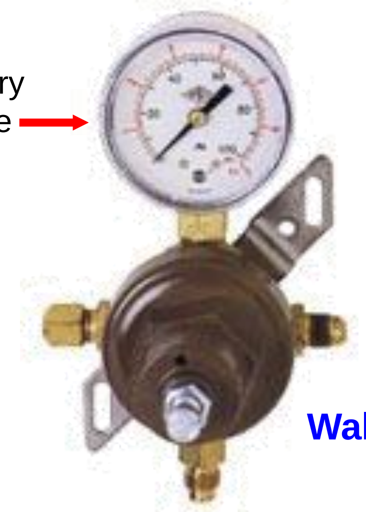
Post-Mix System Components

CO2 Supply

Pressure Regulation - Secondary

- **Secondary Regulator**
  - Can be tank or wall mounted
  - Gauge range from 0 to 100 psi
  - Normal Pressure between 30 to 80 psig
  - Secondary has a relief valve to guard against over-pressurization of system

Secondary Pressure Gauge

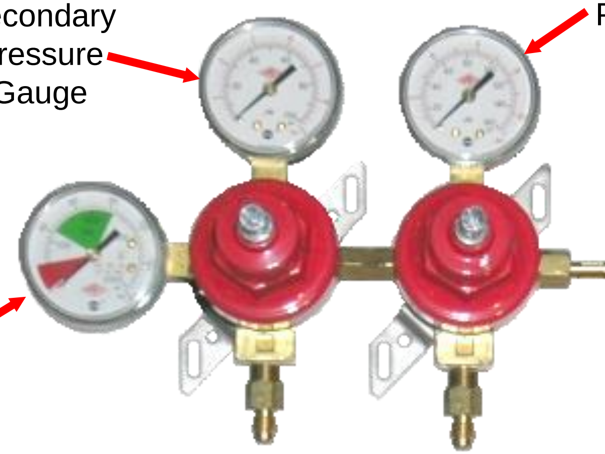


Wall Mount

Secondary Pressure Gauge

Secondary Pressure Gauge

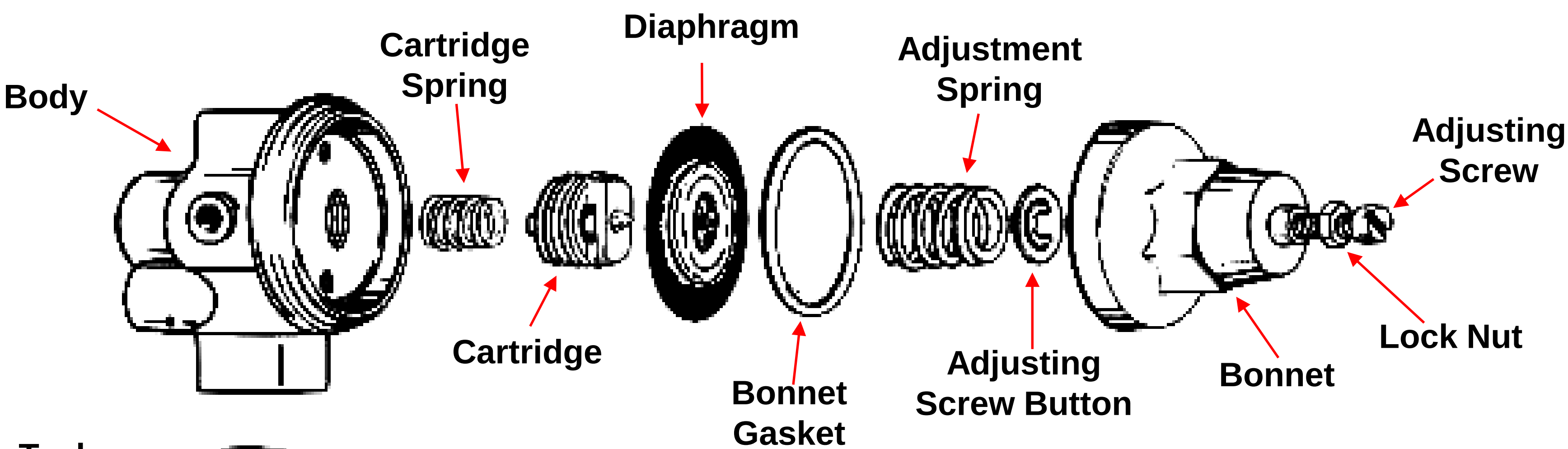
Tank Pressure Gauge

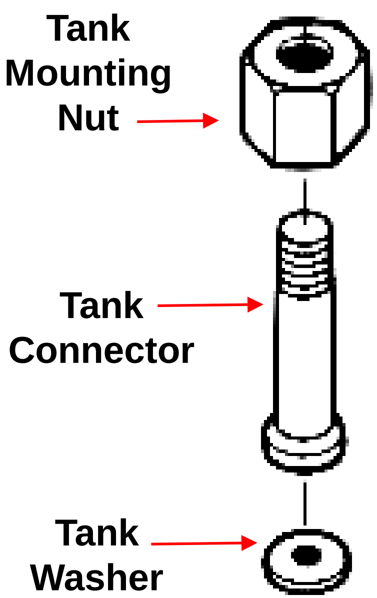


Combination Wall Mount

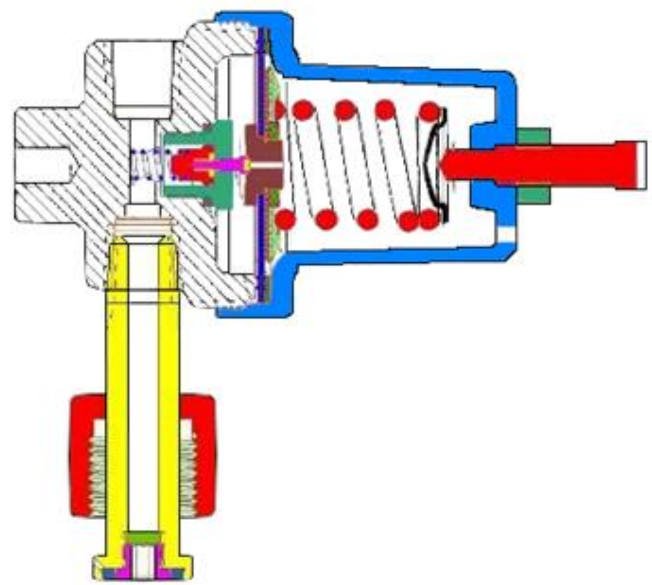
Combination Tank Mount

Post-Mix System Components



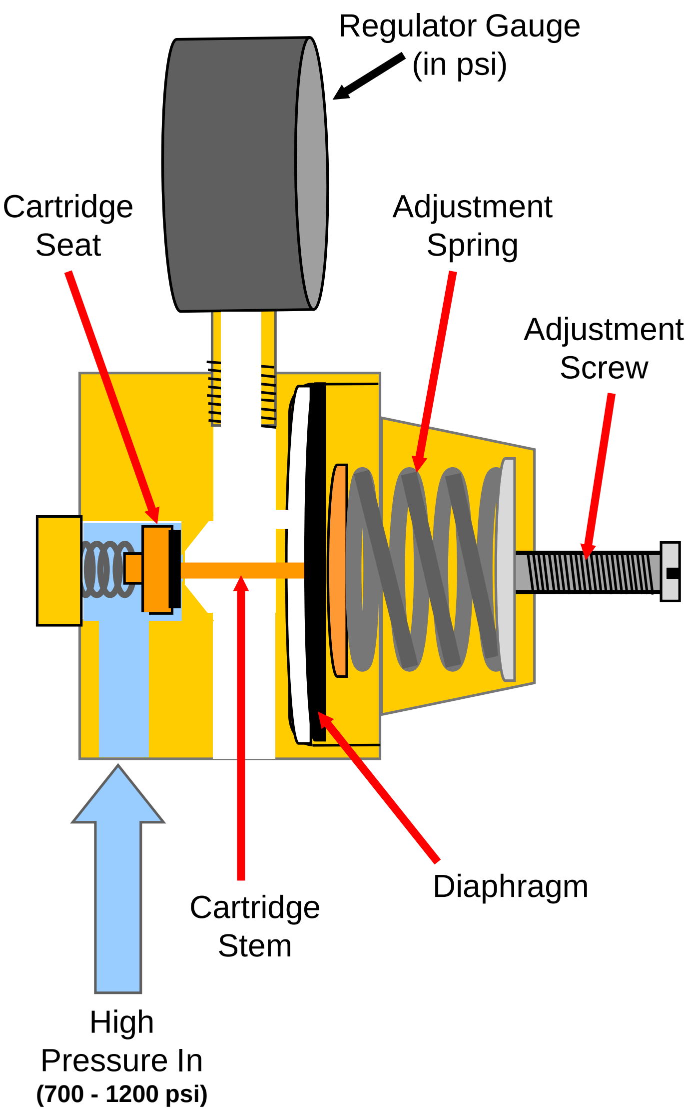


Regulator Parts Identification



Post-Mix System Components

How a Regulator Works



When a regulator is connected to a CO_2 source and the valve is opened, the CO_2 gas will flow into the regulator but will stop at the **Cartridge Seat**.

Turning the regulator **Adjustment Screw** in (clockwise), will place more tension on the **Adjustment Spring** and cause the spring to push back on the **Diaphragm**.

The **Diaphragm** will in turn push back the **Cartridge Stem** and **Seat**, thus allowing CO_2 to flow into the regulator.

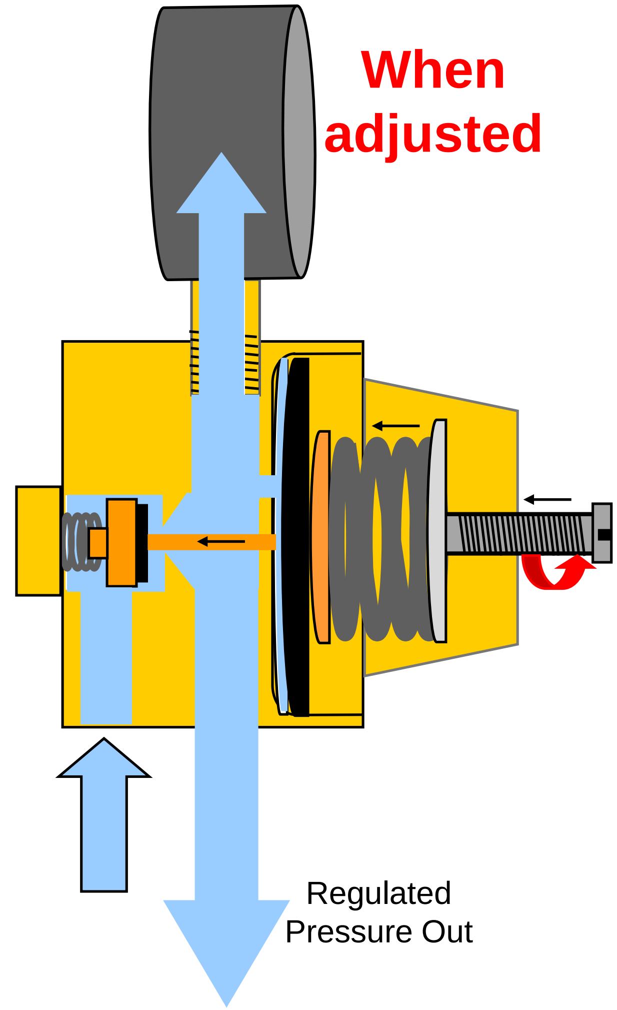
The CO_2 will flow into the regulator body until the pressure in the regulator equalizes to the tension pressure placed on the **Adjustment Spring**.

At that equalized pressure, the **Diaphragm** will move forward allowing the **Cartridge Seat** to seal the inlet opening and stop the flow of inbound CO_2.

The equalized pressure in the regulator may be read in "pounds per square inch" (PSI) on the regulator gauge.

Continue turning in on the adjustment screw until desired pressure is reached.

When there is a demand for CO_2 on the system, the pressure will lower in the regulator and begin the above process again.



Post-Mix System Components

Syrup Supply

- Product Containers
- Syrup Pumps
- Connection Devices
- Syrup Systems

Post-Mix System Components

Syrup Supply

The syrup supply adds taste and color to the post-mix beverages.

- Syrup is normally packaged in BIB (Bag in Box) containers, but may also be found in stainless steel tanks
- The syrup supply is usually propelled to the dispensing (and mixing) valves using a syrup pump or CO2 gas

Areas of Focus:

- **Delivery Systems**
- **Containers**
- **Pump Operation**

Post-Mix System Components

Syrup Supply

Delivery Systems

- **Most beverage locations in the United States now utilize the BIB (Bag in Box) system**
  - The BIB system utilizes a CO_2 or air driven pump to pull syrup from a collapsible plastic bag encased in a cardboard box, and propel the syrup to the dispenser mixing valves

- **Many parts of the world still use the five gallon (FIGAL) transfer tank system to supply their post-mix syrup needs**
  - The tank system uses CO_2 to propel the syrup from a stainless steel tank to the dispenser mixing valves

Post-Mix System Components

Syrup Supply

Delivery Systems – Tank System

The tank system utilizes a reusable stainless steel tank filled with syrup.

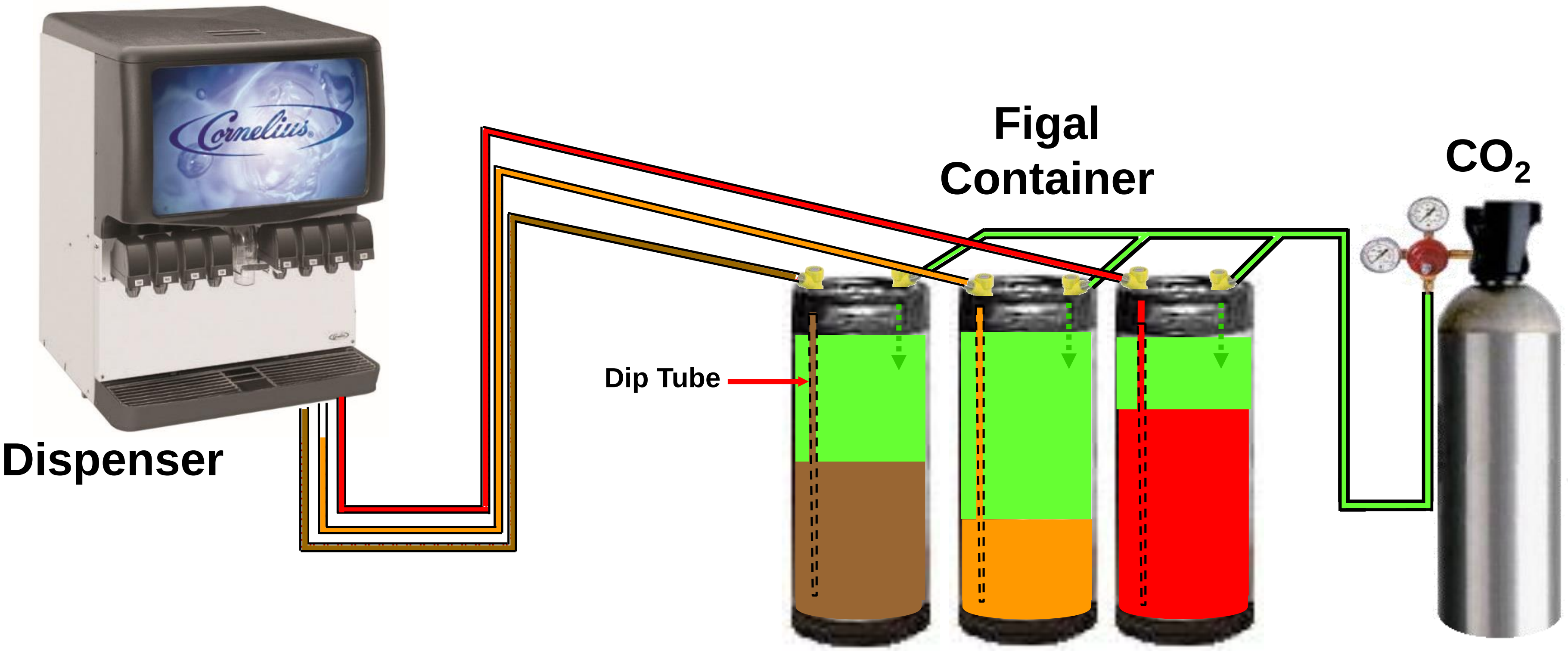
- Each tank has a “gas inlet” and a “syrup outlet” port, plus a removable lid. The tanks must be depressurized before removing the lid.
- A dip tube reaching the bottom of the tank is connected to the syrup outlet port
- When pressure is introduced to the tank, the syrup is pushed to the bottom to the tank, up the dip tube and through the syrup outlet.
- A locking connector is attached to the “gas inlet” and the “syrup outlet”
  - Pin-Lock Type - small metal pegs protruding from the posts.
  - Ball-Lock Type - Pressure Release Valve

Pin-Lock Connector

Post-Mix System Components

Syrup Supply

Delivery Systems – Tank System



Post-Mix System Components

Syrup Supply

Delivery Systems - BIB

Bag-in-Box is a bag filled with syrup, encased in a box

- There is a connection receiver at one end of the bag.
- A pump with a line and connector is attached to the bag. Syrup is pumped out of the bag, moved through the pump and to the dispensing unit. When the bag empties (collapses), the pump shuts down.
- There are three popular types of connectors
  - The Coca-Cola connector
  - The General Beverage connector
  - Pepsi connector
- A Bag Selector allows for the hook-up of two BIB containers to a single pump

Connection receiver

Coke Connector

General Beverage Connector

Pepsi Connector

Bag Selector

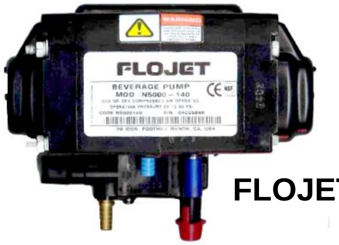
Post-Mix System Components

Syrup Supply

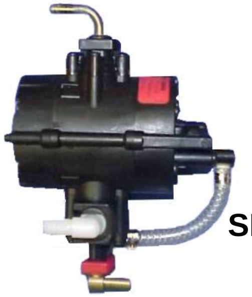
Pump Operation

The Bag-in-Box pump

- FlowJet and Shurflo are the two most widely used pumps
- The pumps may be driven with CO2 or an air compressor
- Normal pump inlet pressure settings are between 30 to 70psi
- The pump draws syrup out of the BIB bag, through the pump and then pushes it to the dispensing unit



FLOJET PUMP

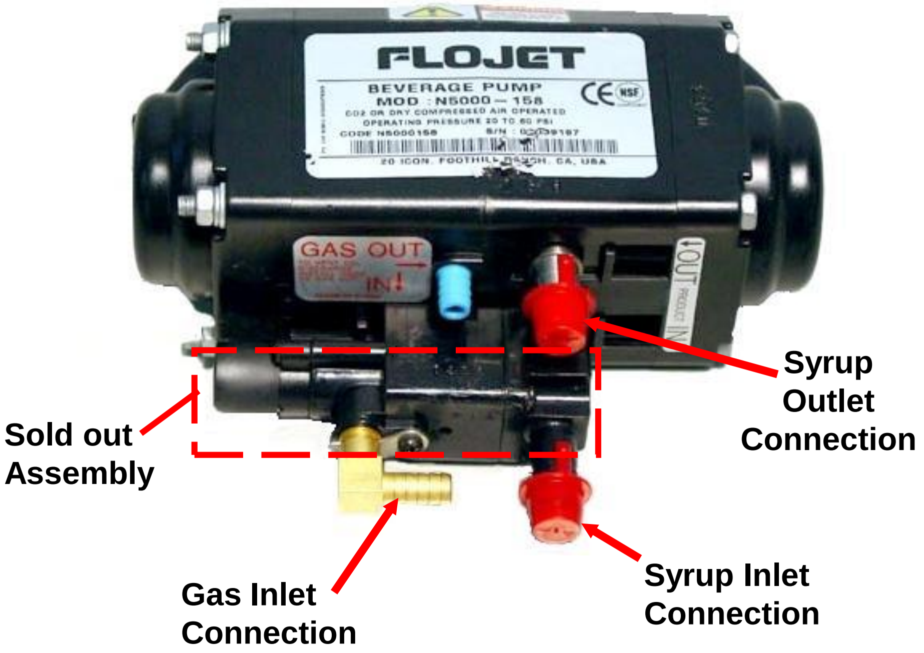


SHURFLO PUMP

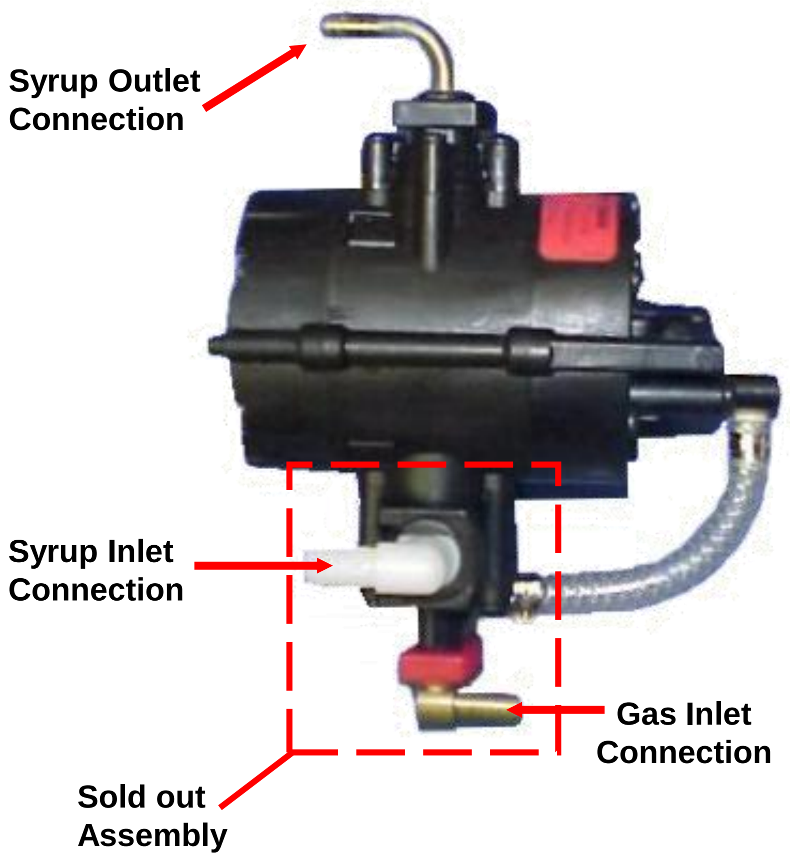
Post-Mix System Components

Syrup Supply

Pump Operation



FLOJET PUMP



SHURFLO PUMP

Post-Mix System Components

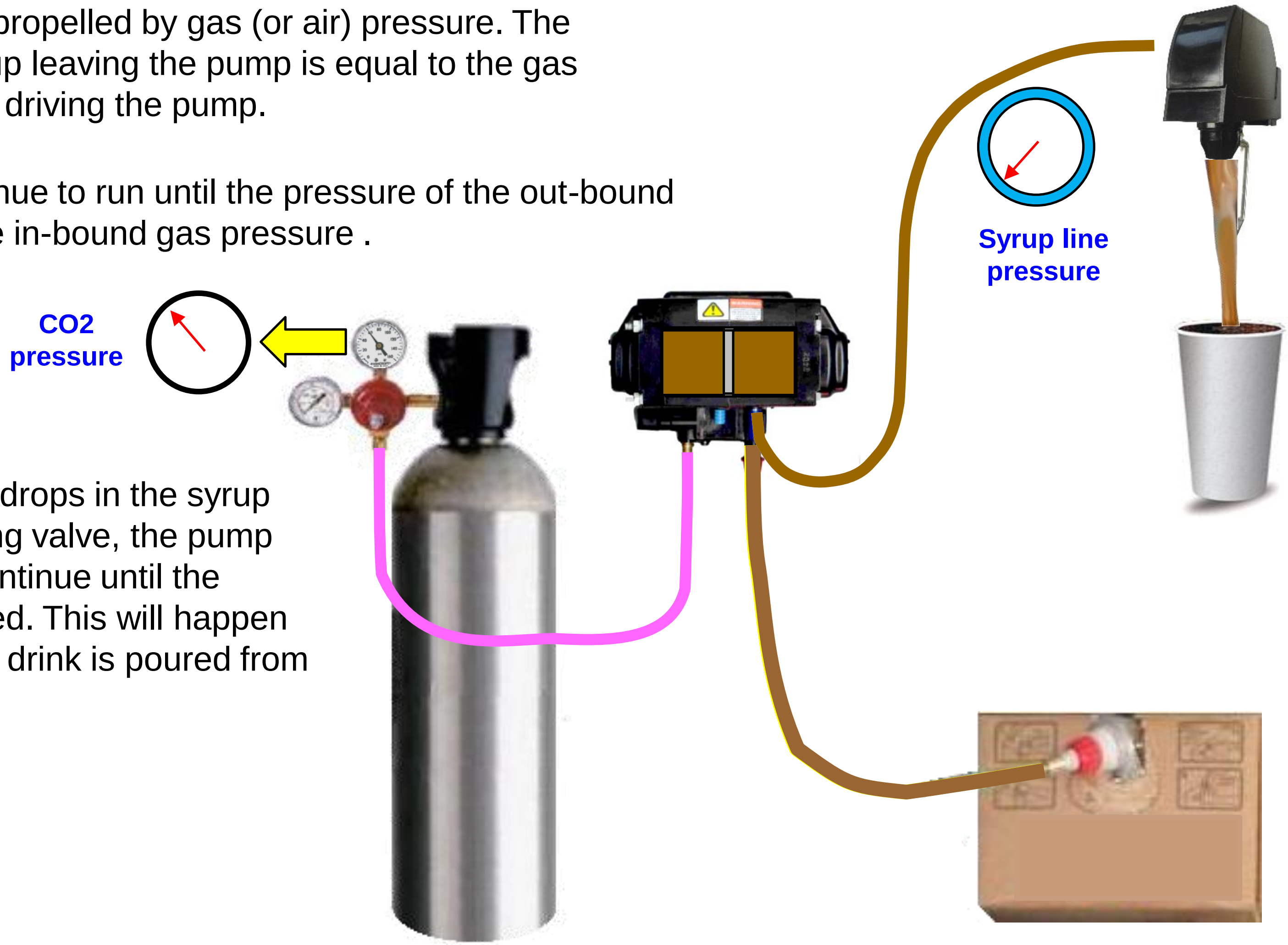
Syrup Supply

Pump Operation

The syrup pump is propelled by gas (or air) pressure. The pressure of the syrup leaving the pump is equal to the gas pressure feeding or driving the pump.

The pump will continue to run until the pressure of the out-bound syrup is equal to the in-bound gas pressure .

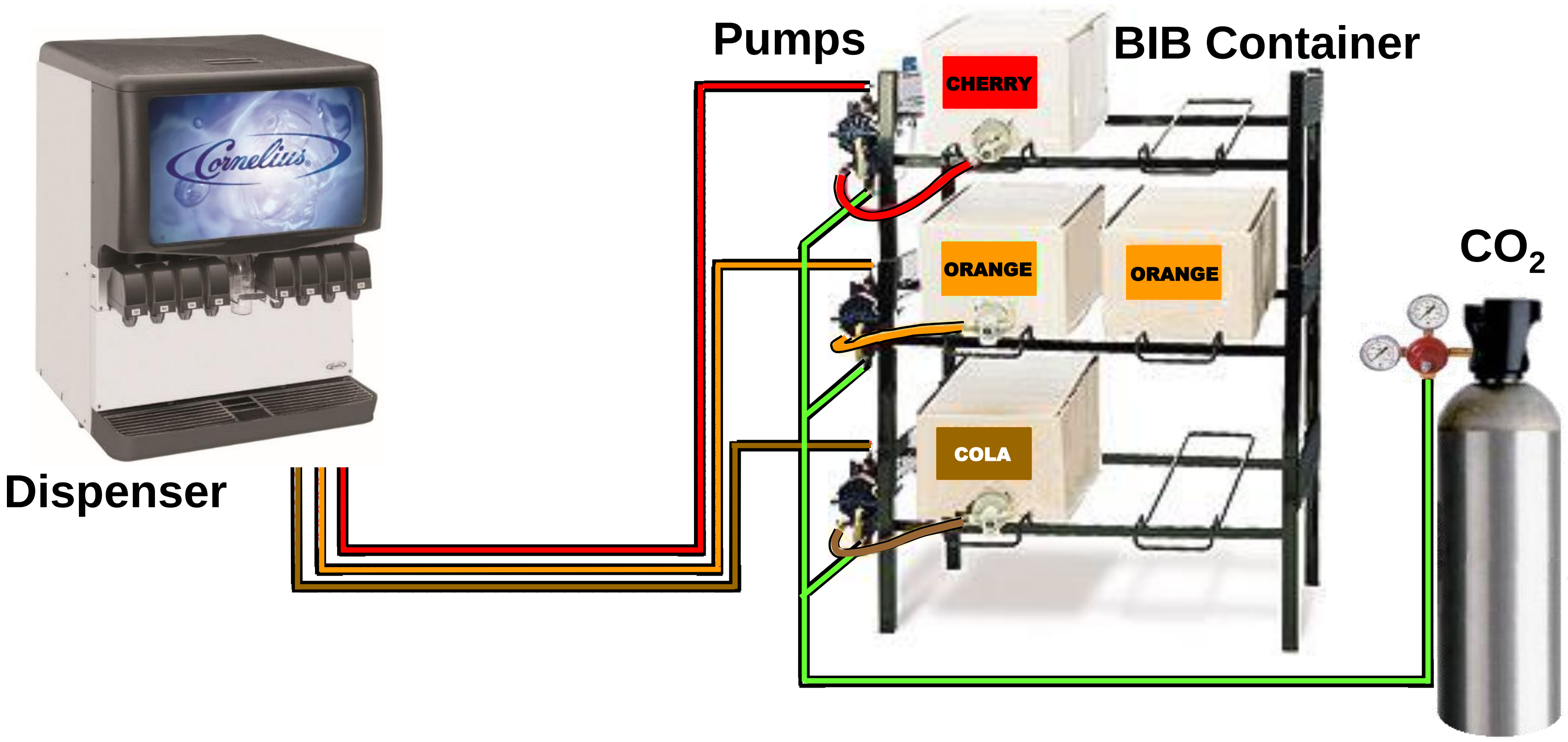
When the pressure drops in the syrup line to the dispensing valve, the pump will activate and continue until the pressure is equalized. This will happen almost every time a drink is poured from the valve.



Post-Mix System Components

Syrup Supply

Delivery Systems - BIB



Post-Mix System Components

- **Water Supply**
- **CO_2 Supply**
- **Syrup Supply**
- **Carbonation**

Post-Mix System Components

Carbonation

Carbonated water (or soda water), is plain water into which carbon dioxide gas has been absorbed.

The process of absorbing carbon dioxide gas into water is called carbonation.

Areas of Focus:

- **Carbonation Characteristics**
- **Carbonator Operation**

Post-Mix System Components

Carbonation

Carbonation Characteristics

- **Carbonation is a key ingredient in soft drinks It helps to define the taste, scent and level of visual appeal**
  - Carbonation enhances the flavoring of the beverage
  - Carbonation carries the aroma of beverage
  - Carbonation is often used to give the drink a "bite". However contrary to popular belief, the fizzy taste is caused by the diluted carbonic acid inducing a slight burning sensation, and is not caused by the presence of bubbles.

Post-Mix System Components

Carbonation

Carbonation Characteristics

- **Carbonation is effected by a number of factors:**

Time The longer water sits under CO_2 pressure the more gas it will absorb until it reaches it's saturation level. Conversely, the longer carbonated water sits unpressurized, the more gas will break-out into the atmosphere.

Pressure The higher the CO_2 pressure is on water, the more gas it will absorb until it reaches it's saturation level.

Agitation Agitating a carbonated drink will hasten the break-out of CO_2 into the atmosphere.

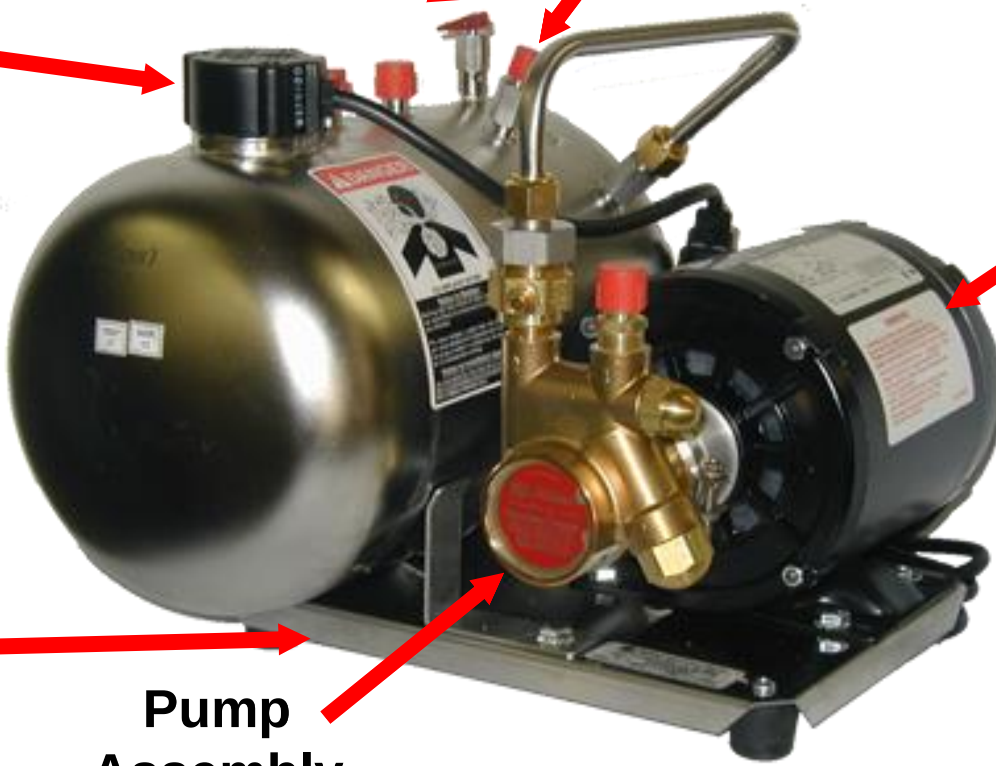
Temperature The colder the temperature of water, the more readily the CO_2 is absorbed until it's saturation point is reached. Also the colder the drink, the longer the CO_2 stays in the liquid.

Post-Mix System Components

Carbonation Chart

Temperature of Beverage	Carbonation Level	Loss of Carbonation
36°	100%	0%
38°	96%	4%
40°	92%	8%
42°	88%	12%
44°	84%	16%
46°	81%	19%
48°	78%	22%
50°	75%	25%

Post-Mix System Components



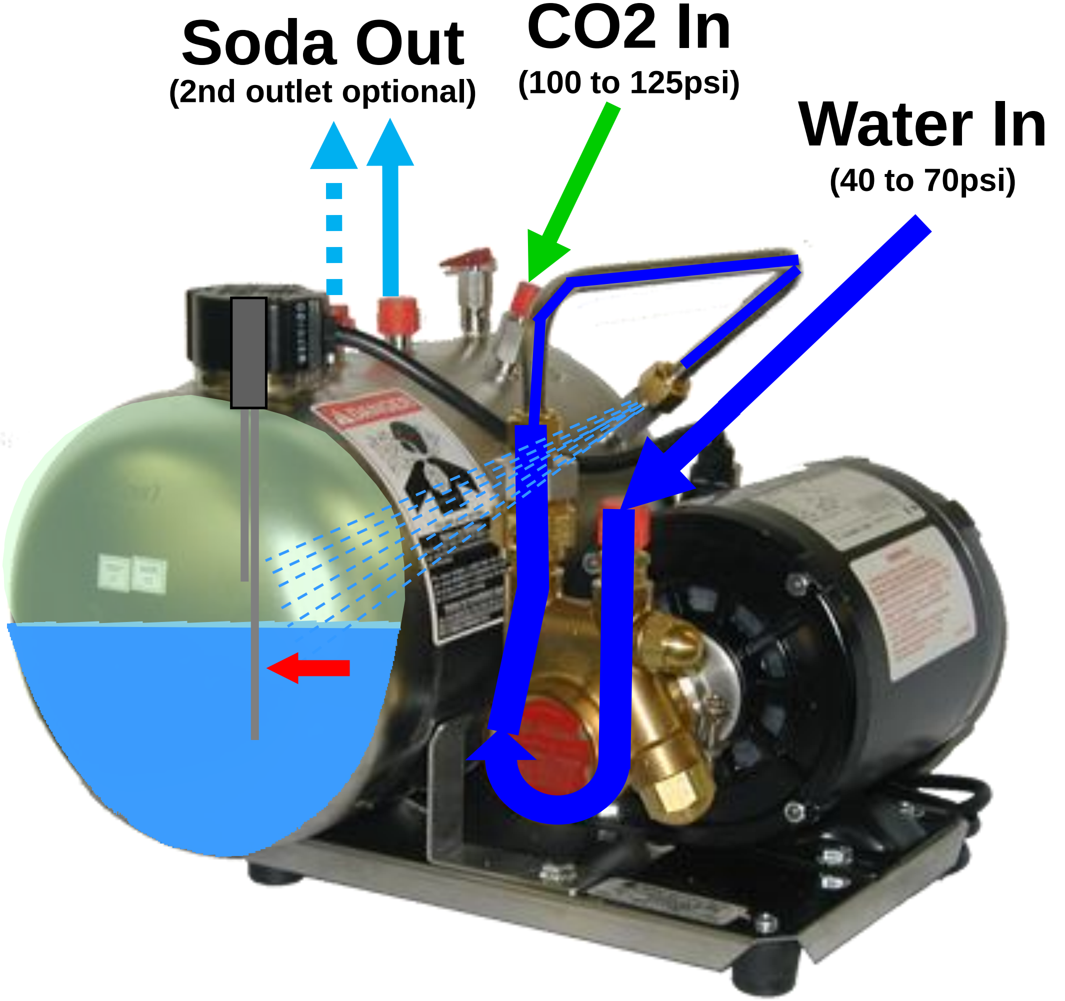
Carbonator Operation

Post-Mix System Components

Carbonation

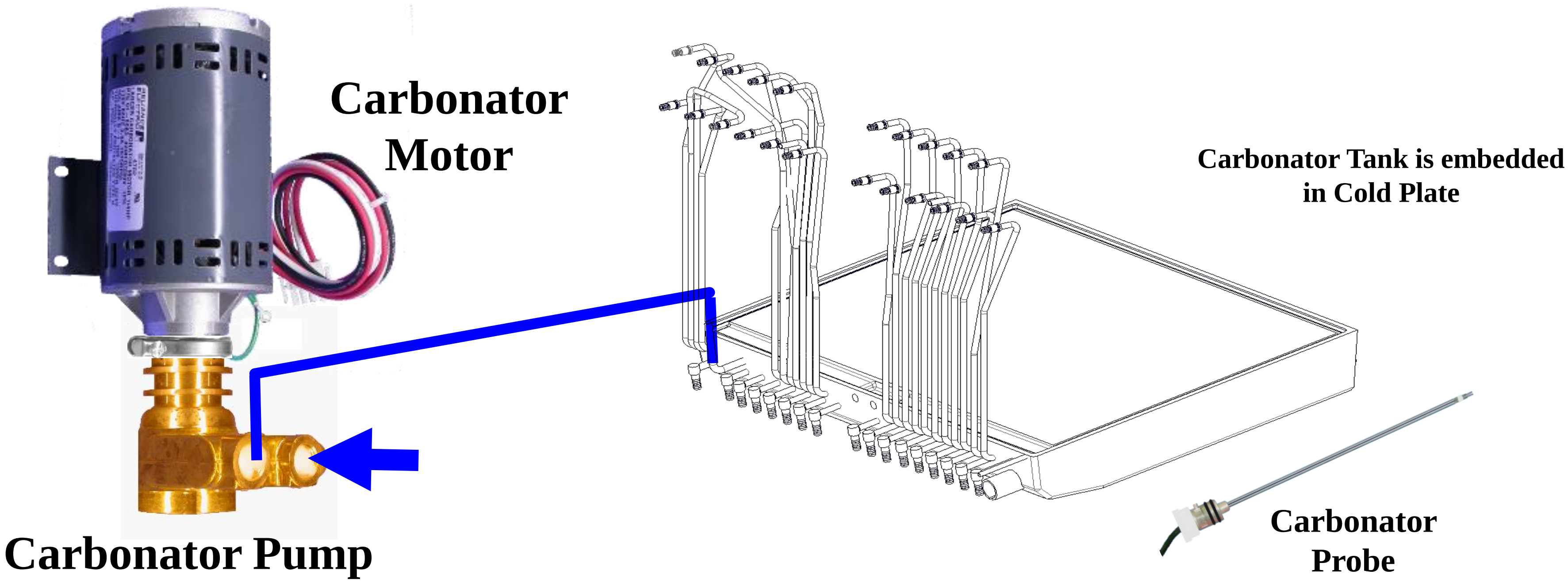
Carbonator Operation

1. CO2 gas pressure of 100 to 125psi is maintained in the carbonator tank.
2. Water pressure of 40 to 70psi enters the carbonator pump.
3. When lower probe recognizes low water level in tank, pump motor cycles to fill tank.
4. Water is pumped into tank through an orifice (to create a spray for maximum CO2 absorption) until water level reaches upper probe level, then pump motor shuts off.



Post-Mix System Components

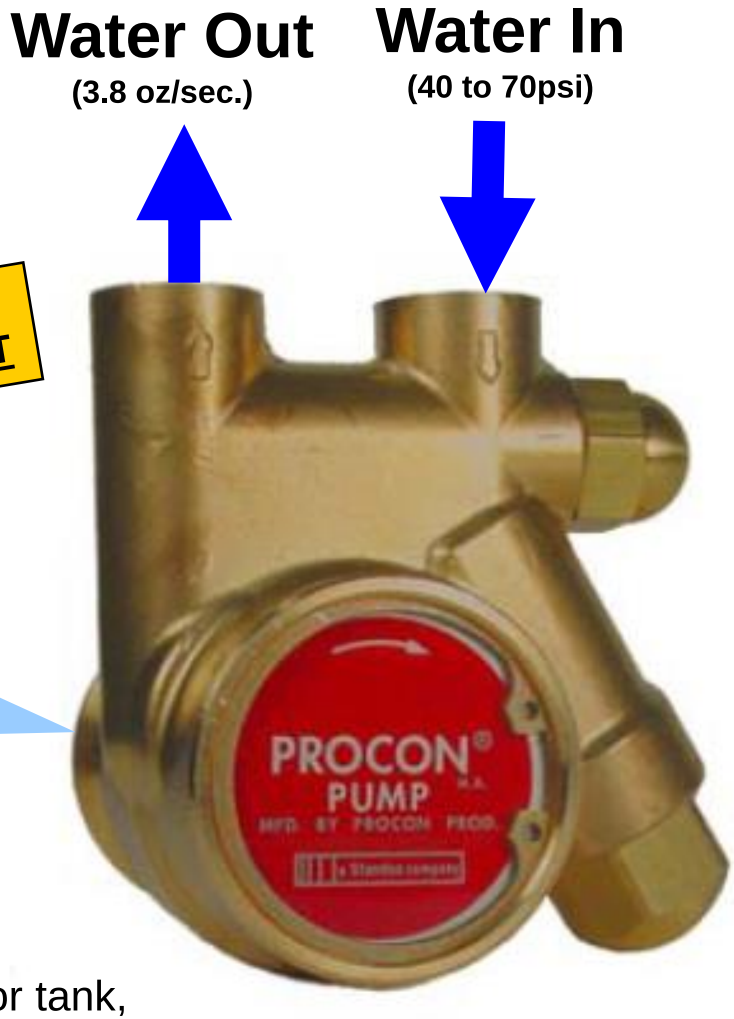
Cold Carbonation



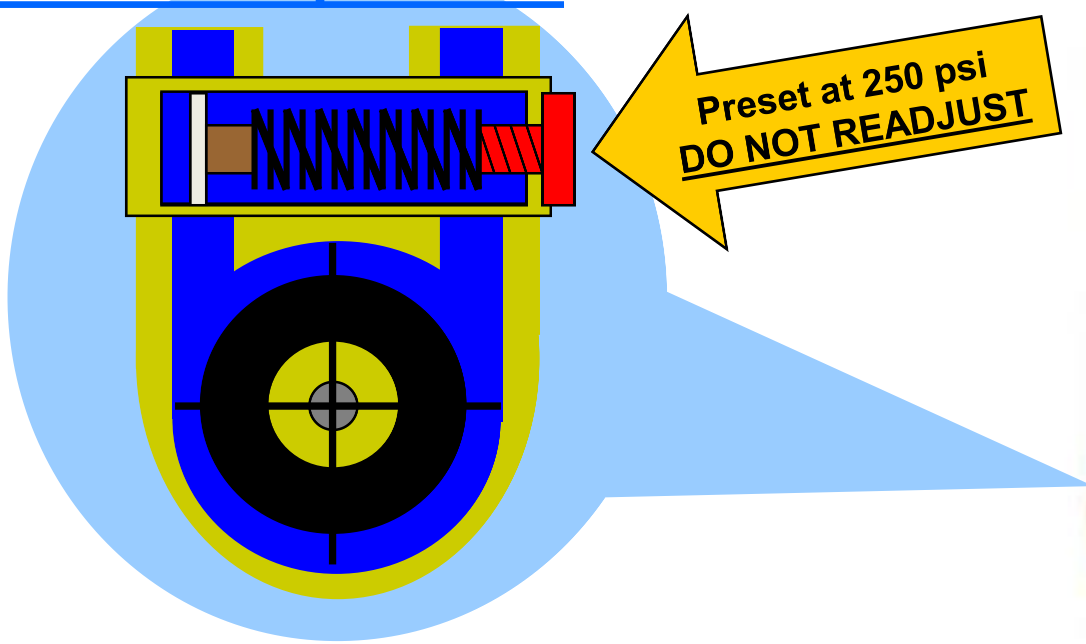
An alternative, and more effective way to carbonate is through "Cold Carbonation". In this method the carbonator tank, plus pre and post chill circuits, are embedded within a cold plate that is covered with ice. This not only allows for maximum absorption of CO_2 within the water, but it also assures that the gas remains in the water. Since cold water absorbs CO_2 more efficiently then ambient water, a lower CO_2 pressure can be used, typically 70 to 75 psig.

Post-Mix System Components

Carbonation



Carbonator Operation



To prevent the pump from over-pressurizing the carbonator tank,
the pump has a built in by-pass chamber to circulate water in excess of 250psi.

Post-Mix System Components

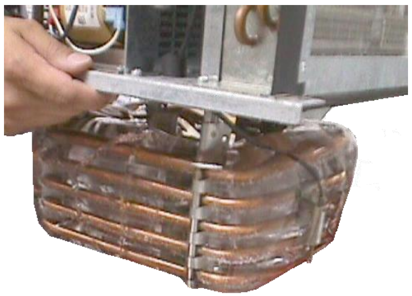
Carbonation

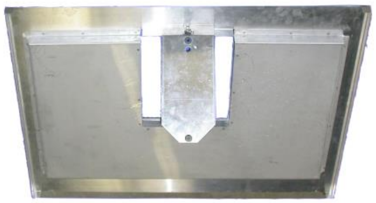
Carbonator Operation -Start-up Procedure

1. Turn on water.
2. Purge air from carbonator tank by pulling relief valve until water comes out.
3. Purge air from dispensing valves by activating dispensing valves until water comes out.
4. Turn on CO_2.
5. Purge water from tank and lines by activating dispensing valves until CO2 comes out.
6. Plug into Electric Supply (Properly grounded).
7. Allow Carbonator to run until tank is full, then activate vales until a steady stream of carbonated water is flowing.

Post-Mix System Components

- **Water Supply**
- **CO_2 Supply**
- **Syrup Supply**
- **Carbonation**
- **Refrigeration**





Post-Mix System Components

Refrigeration

Refrigeration is essential to a post mix system as it preserves carbonation and assures the dispense of a refreshingly cold drink. It is also necessary to prevent foaming and to maintain a drink quality.

Areas of Focus:

- **Cooling Options**
- **Ice Cooling**
- **Mechanical Refrigeration**
- **Adding Ice to Maintain Drink Quality**

Post-Mix System Components

Refrigeration

Cooling Options

Dispensers with beverage cooling, use either an **Ice Cooled** (cold plate) or **Mechanically Cooled** (water-bath) system to cool the beverages.

Ice Cooled

(IBD – Ice Beverage Dispenser)

Mechanically Cooled

(CED – Counter Electric Dispenser)

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

The Ice Cooled is the most common system for beverage cooling. It consist of an aluminum cold plate located inside the dispenser’s ice storage bin, through which the carbonated water and syrups are run before flowing to the dispensing valves. Dispensers with this system are available as a counter top unit, with the ice stored in an ice bin behind the valves, or an under-counter unit, with the ice stored below the counter.

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

The advantages to the Ice Cooled method of cooling are:

- It is an effective method of cooling
- It is a simple and reliable cooling method
- It's easy to maintain
- Less expensive than mechanical systems to operate
- As long as ice is available, there is endless cooling capacity

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

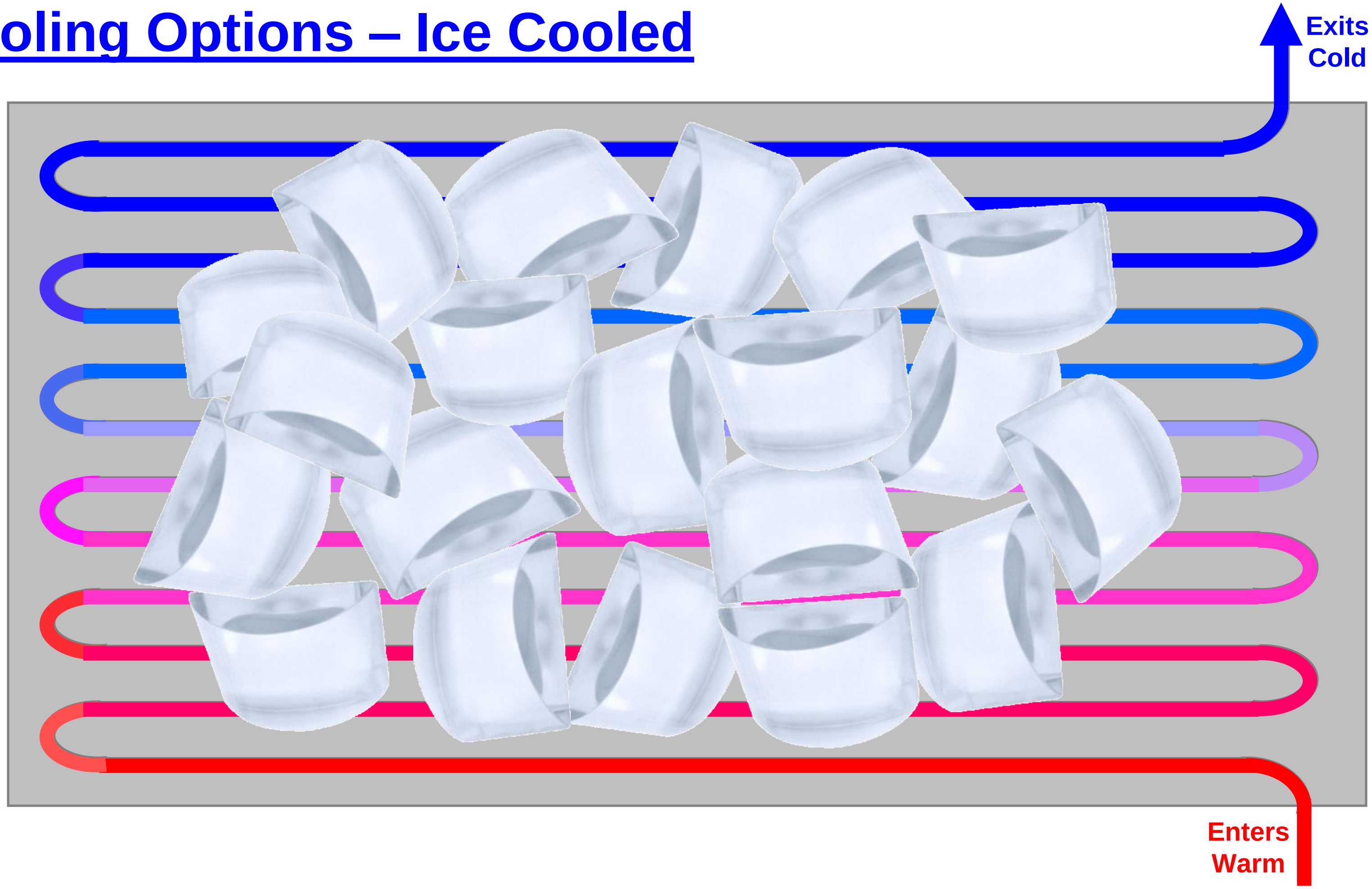
Factors that must be considered when choosing an ice cooled system are:

- The number of drinks to be served and capacity of ice bin (about 20 lbs. for each 100 12-oz drinks).
- The temperature of incoming water and syrup
- 50% for cooling, 50% for cups
- Ability to drain melted ice

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled



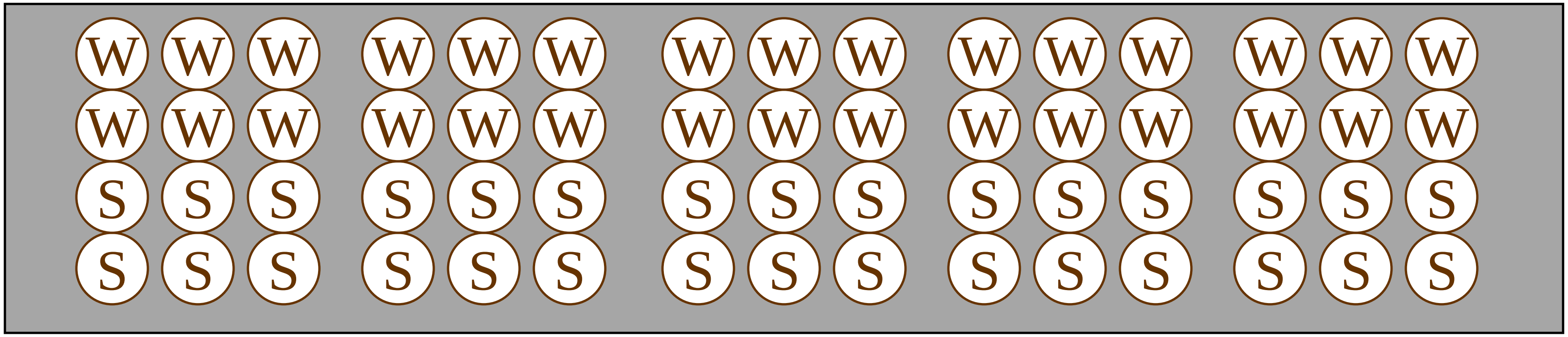
Cold Plate Cooling Circuits

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

Cold Plate Cross Section



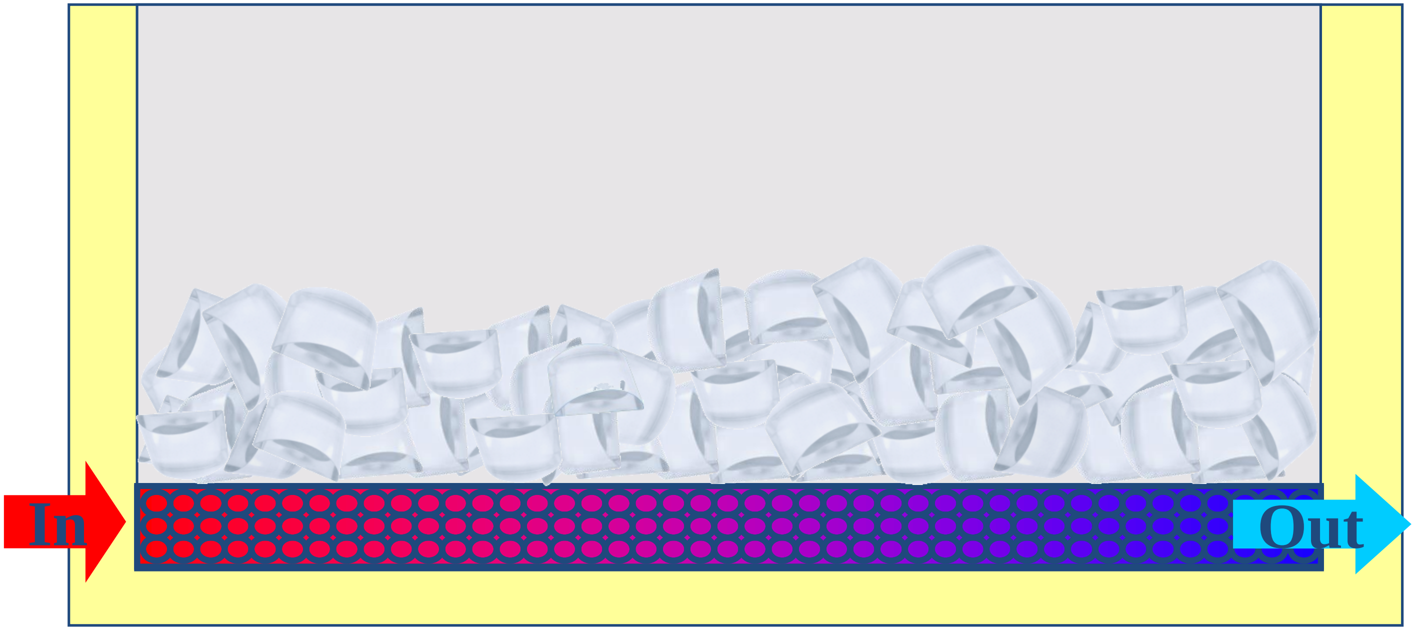
Water coils on top for maximum heat transfer

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

Cold plate theory:



Heat is removed as the water and syrup travel through the cold plate.

Post-Mix System Components

Refrigeration

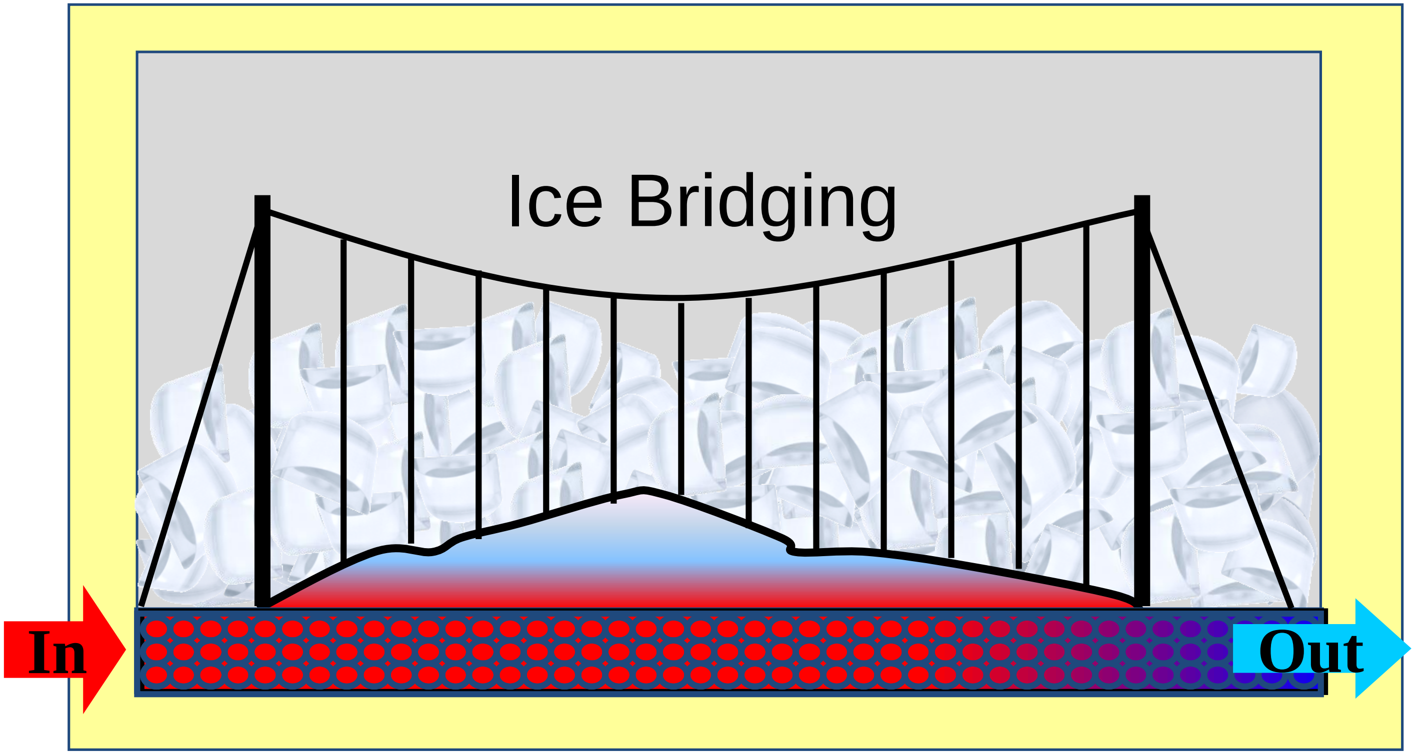
Cooling Options – Ice Cooled

Heat transfer occurs between the warm product inside the cold plate beverage circuits and the ice in contact with the top of the aluminum cold plate. Because the cooling will take place only with ice on the cold plate surface, the system requires constant contact between ice and the cold plate. A disadvantages to ice cooled systems is that sometimes a “Bridge” can form on the cold plate. A “Bridge” is defined as an area where the ice melts away from the plate and ice forms. This condition creates uneven cooling and warm spots in the cold plate. New ice will fall on top of the “Bridge” and cannot reach the cold plate. The result will be warm, foaming drinks and a loss of carbonation. Most beverage dispensers are equipped with ice bin agitator assemblies to break down the bridges to assure ice and cold plate contact.

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

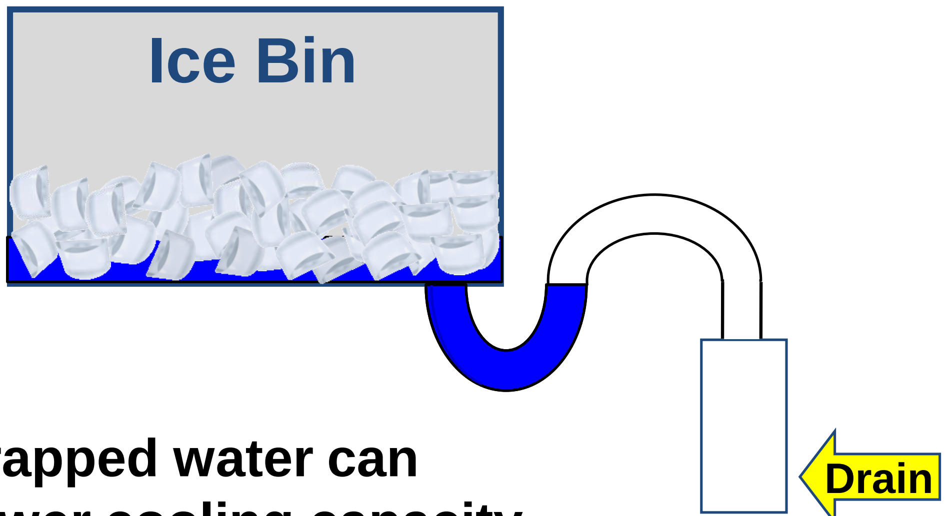


Bridging reduces heat transfer

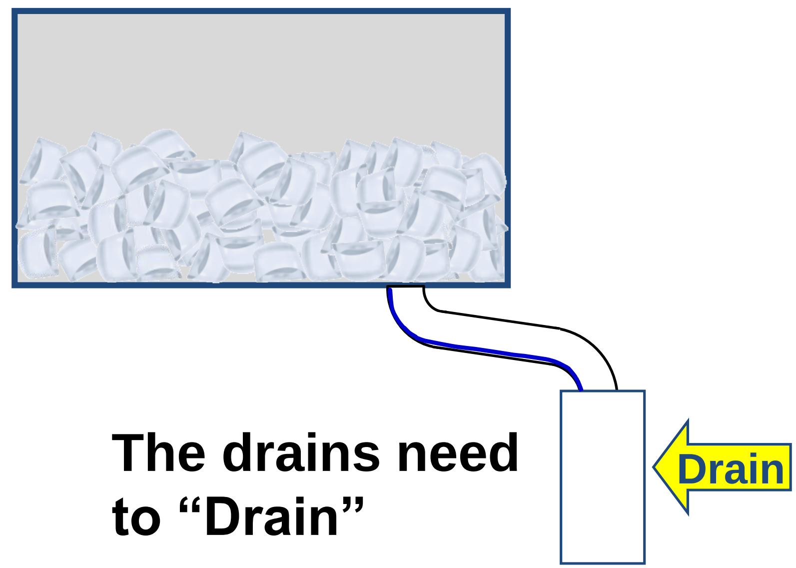
Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled



Trapped water can lower cooling capacity



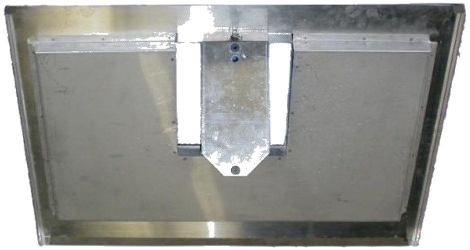
The drains need to "Drain"

Post-Mix System Components

Refrigeration

Cooling Options – Ice Cooled

Some dispenser manufacturers, like Lancer, offer a bin adapter kit that allows ice maker manufacturer’s to mount their units on top of the dispenser. The ice made by the ice machine, drops into the storage area of the dispenser and is then dispensed when the lever or button for ice is pushed. However, the level of ice in the dispenser bin must be controlled to avoid any damage. If the ice level is too high, the movement of the ice by the agitator could raise up the ice machine off the unit or damage the agitator assembly. To prevent this, an electronic or mechanical “bin stat” should be installed to control the ice level. Lancer recommends ice levels to be 6” for cube and 9” for cubelet below the top of the ice bin.



Adapter Plate

Post-Mix System Components

Refrigeration

Cooling Options – Mechanically Cooled

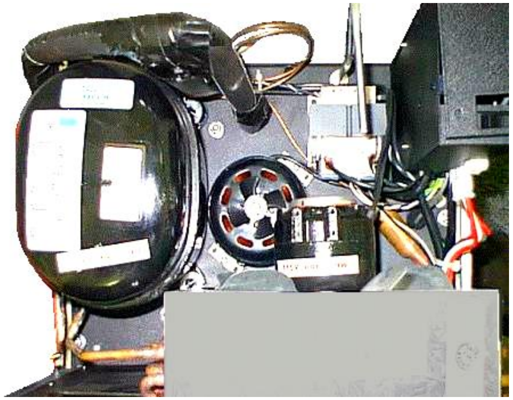
The most popular mechanically cooled drink dispensers contain a water-bath system. With this system, a water filled tank (bath) is located in the dispenser cabinet and is refrigerated by a compressor deck cooling system.

Post-Mix System Components

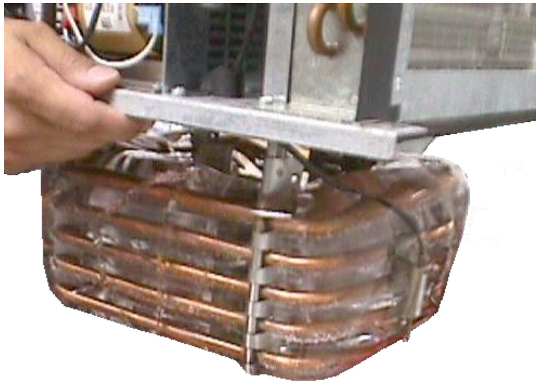
Refrigeration

Cooling Options – Mechanically Cooled

The compressor deck has a set of evaporator coils that are submerged in the water and freeze to form an ice bank. The ice bank is controlled by an electronic probe that cycles the compressor on and off to maintain the ice bank size. All the syrup and water lines are totally immersed in the 28°to 32° water. An agitator motor and propeller circulates the water in the bath to ensure that the product lines are cooled consistently.



Compressor Deck

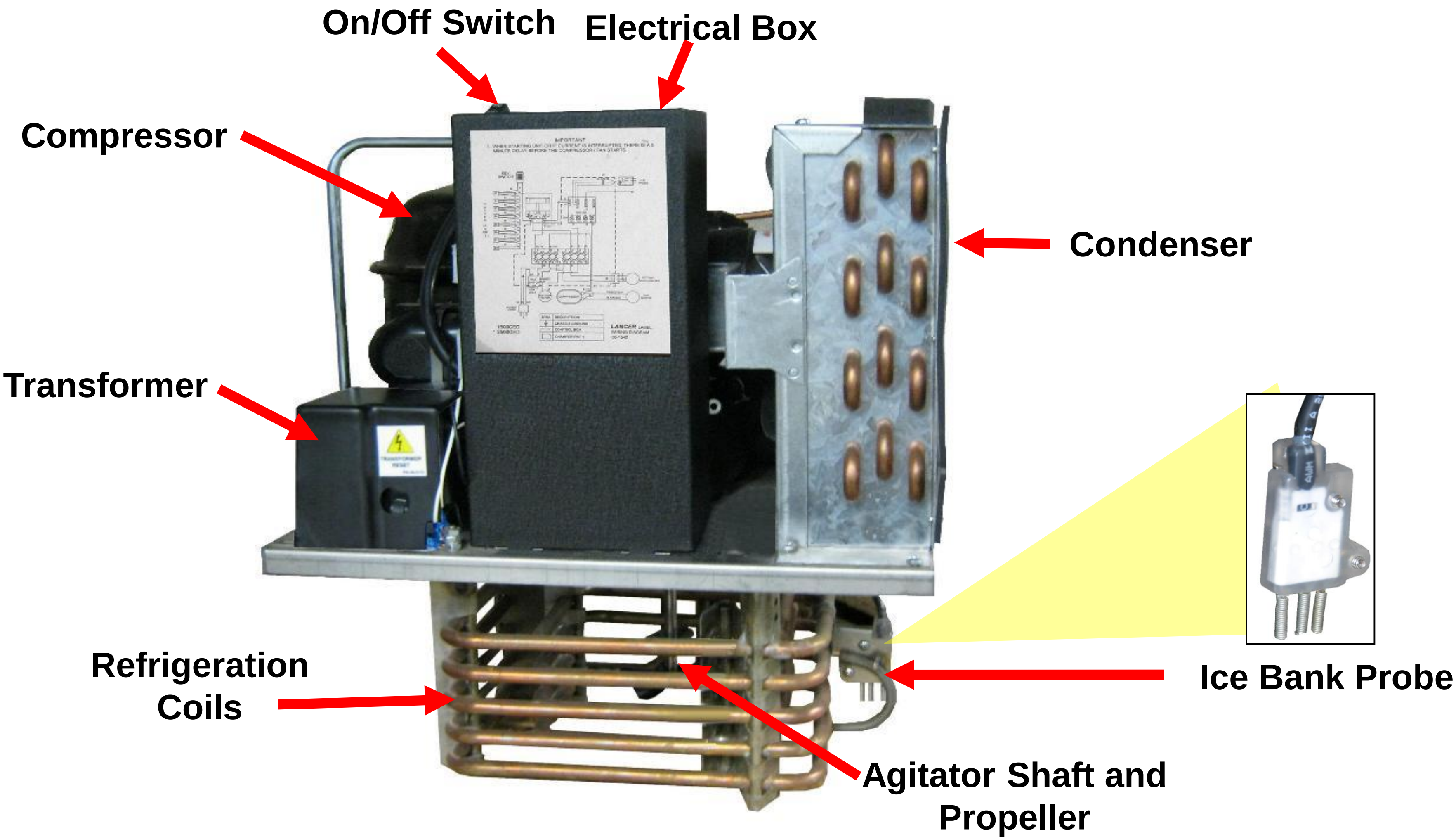


Ice Bank

Post-Mix System Components

Refrigeration

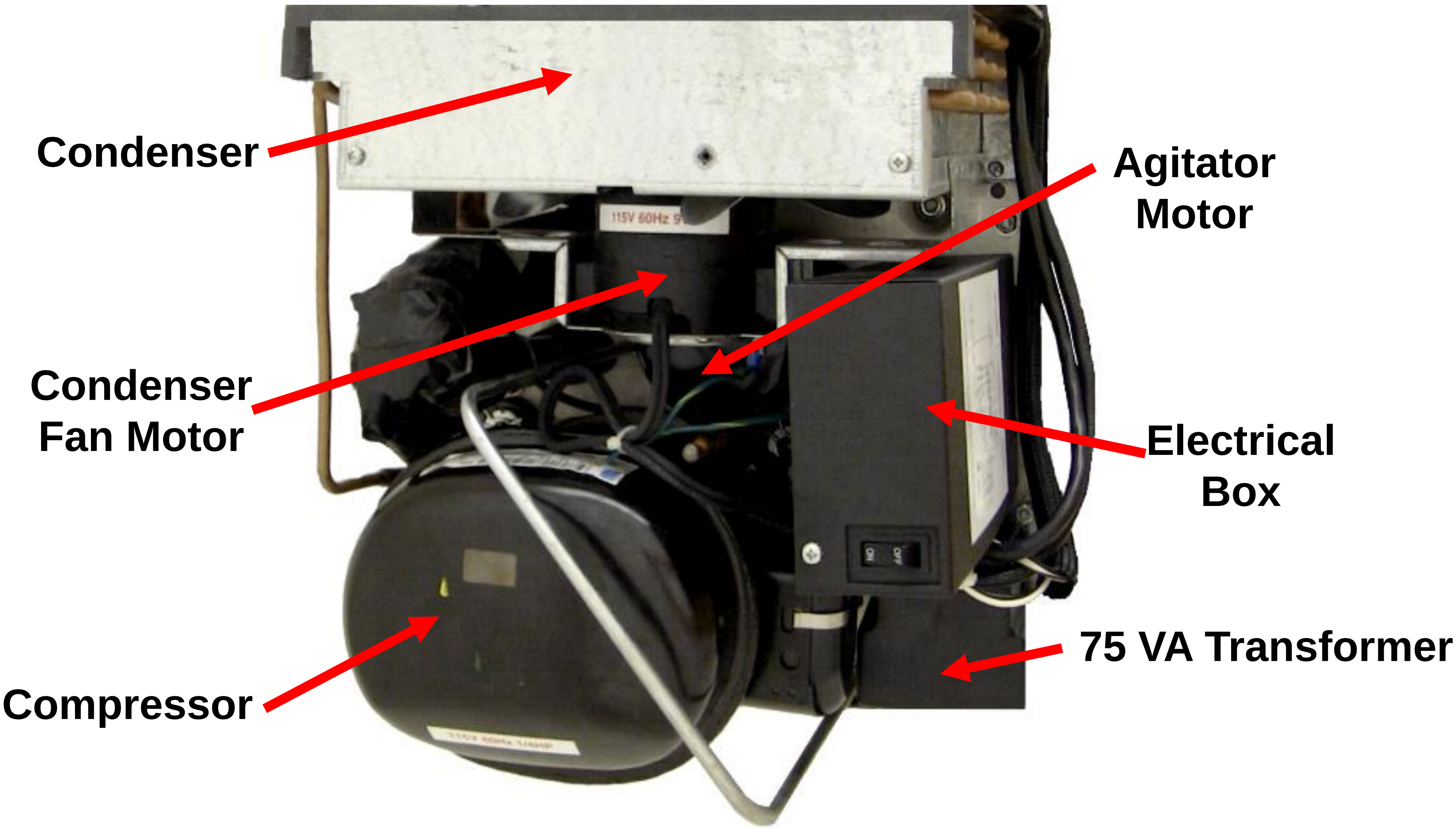
Cooling Options – Mechanically Cooled



Post-Mix System Components

Refrigeration

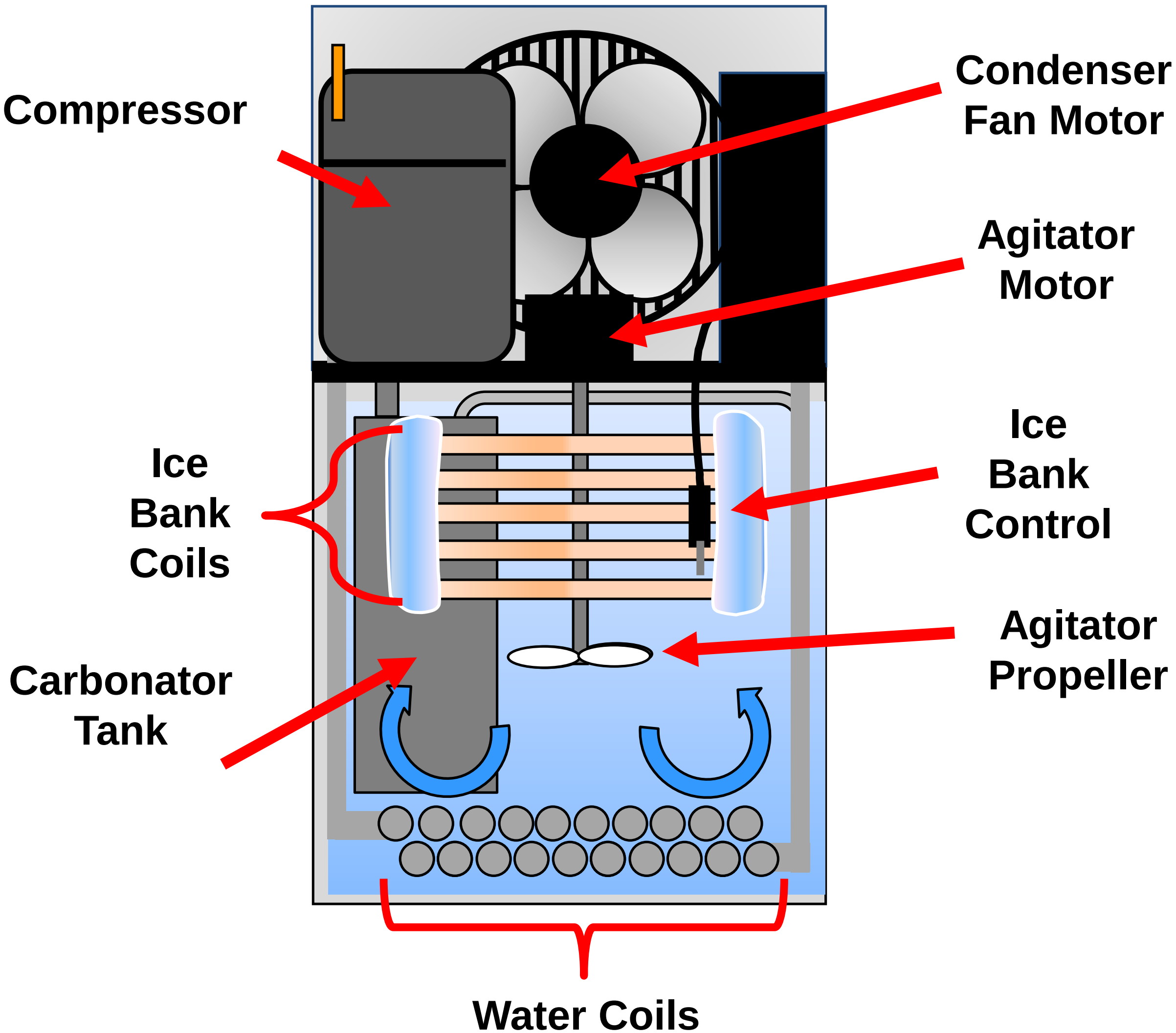
Cooling Options – Mechanically Cooled

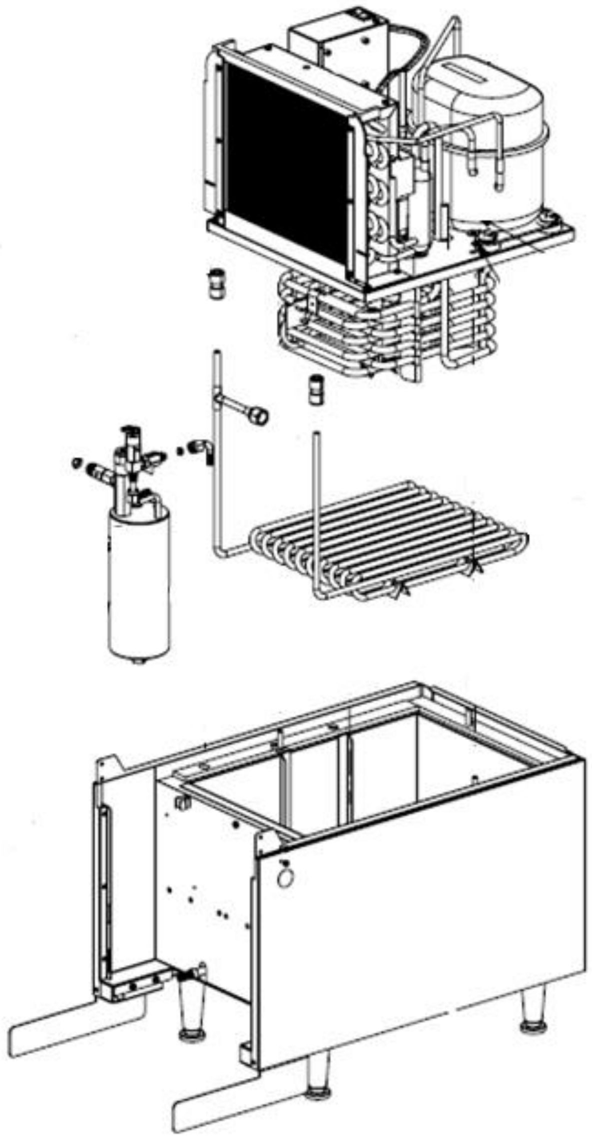


Post-Mix System Components

Refrigeration

Cooling Options – Mechanically Cooled



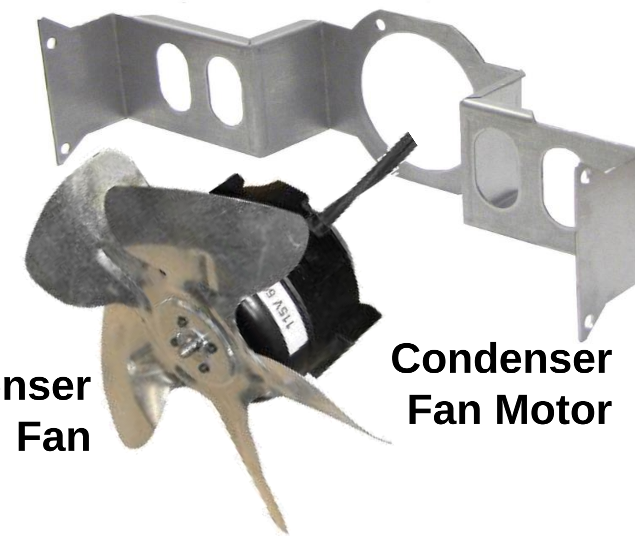


Post-Mix System Components

Refrigeration

Cooling Options – Mechanically Cooled

Condenser Assembly

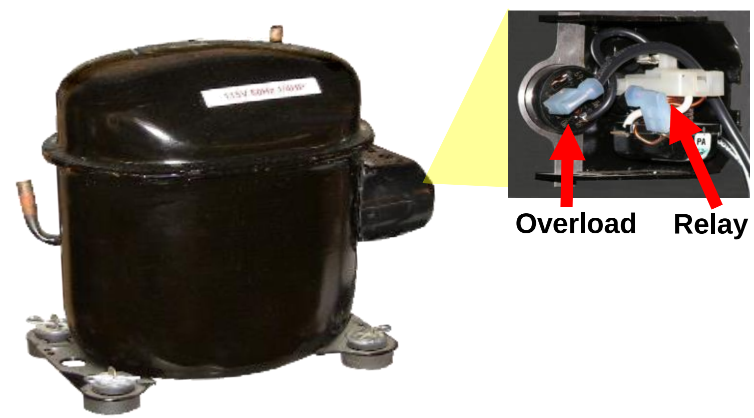


Fan Motor Bracket

Condenser Fan

Condenser Fan Motor

Evaporator Coil Assembly



Overload

Relay

Compressor

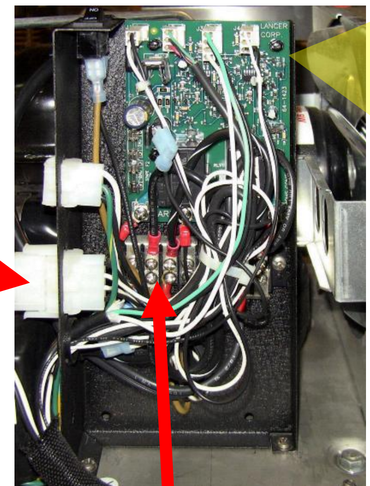
Post-Mix System Components

Refrigeration

Cooling Options – Mechanically Cooled

Agitator Motor

Agitator Propeller



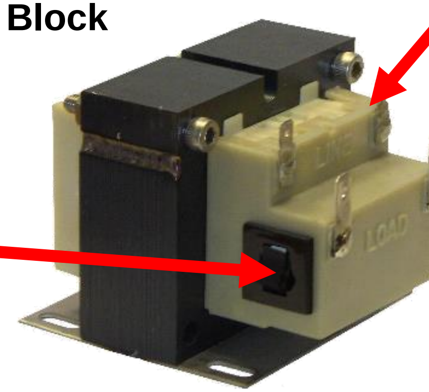
Electrical Box

Pump power plug

Terminal Block

Ice Bank Control PCB

Ice Bank Control Probe

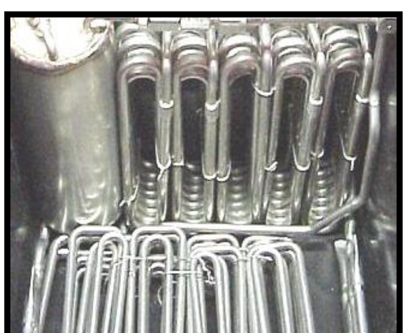


115 vac input

24 vac output

Resettable Breaker

75 VA Transformer



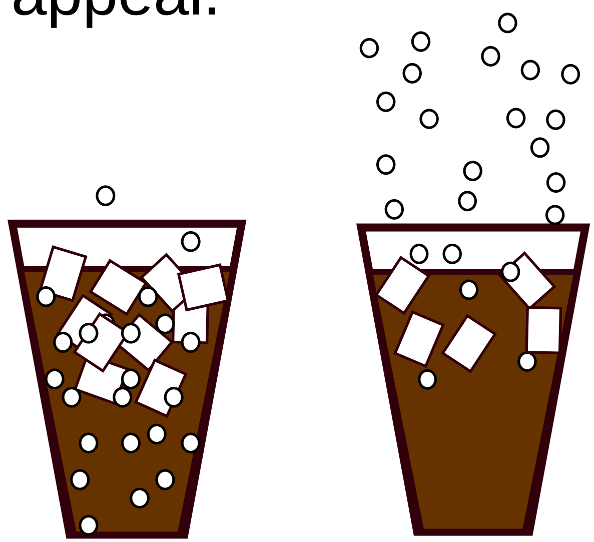
Water & Syrup Circuits

Post-Mix System Components

Refrigeration

Adding Ice to Maintain Drink Quality

- Adding ice to a post mix drink maintains the carbonation, preserves the drink taste and keeps the beverage cold during the consumption period. It also helps to preserve the level of visual appeal.



Less than 40 F

More than 40 F

Post-Mix System Components

The main elements of a post-mix system are:

- **Water Supply**
- **CO2 Supply**
- **Syrup Supply**
- **Carbonation**
- **Refrigeration**
- **Dispensing Valve**

Post-Mix System Components

Dispensing Valve

The main function of the post-mix dispensing valve is to mix the syrup and water (carbonated or plain) at a set ratio.

Valves may include optional activation features such as push-button, lever activation or portion control.

Areas of Focus:

- **Valve Components & Functions**
- **Setting Drink Water to Syrup Ratio**
- **Check the Drink**

Post-Mix System Components

SFV-1 Dispensing Valve

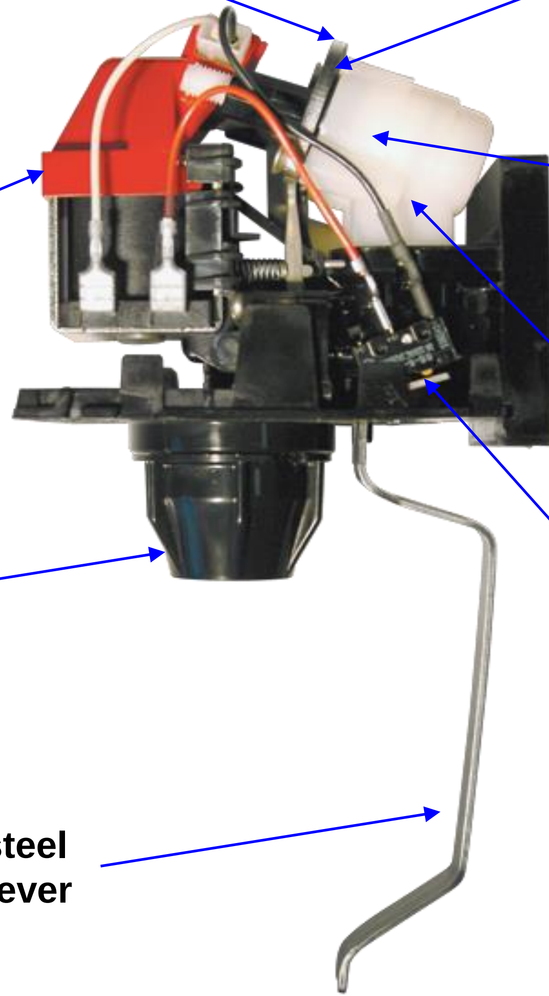
Valve Components

Specially designed retaining system for reliability improvement

Thicker retaining plate for improve durability

Brand color-matching solenoid cover with modified design to improve durability

Specific translucent flow control body for quality improvement



Specific water ceramic set designed to provide consistent performance over a wide range of H_2O pressure (30 to 110 psi).

Nozzel & Diffuser

Micro Switch

Stainless steel (Sanitary) lever

Post-Mix System Components

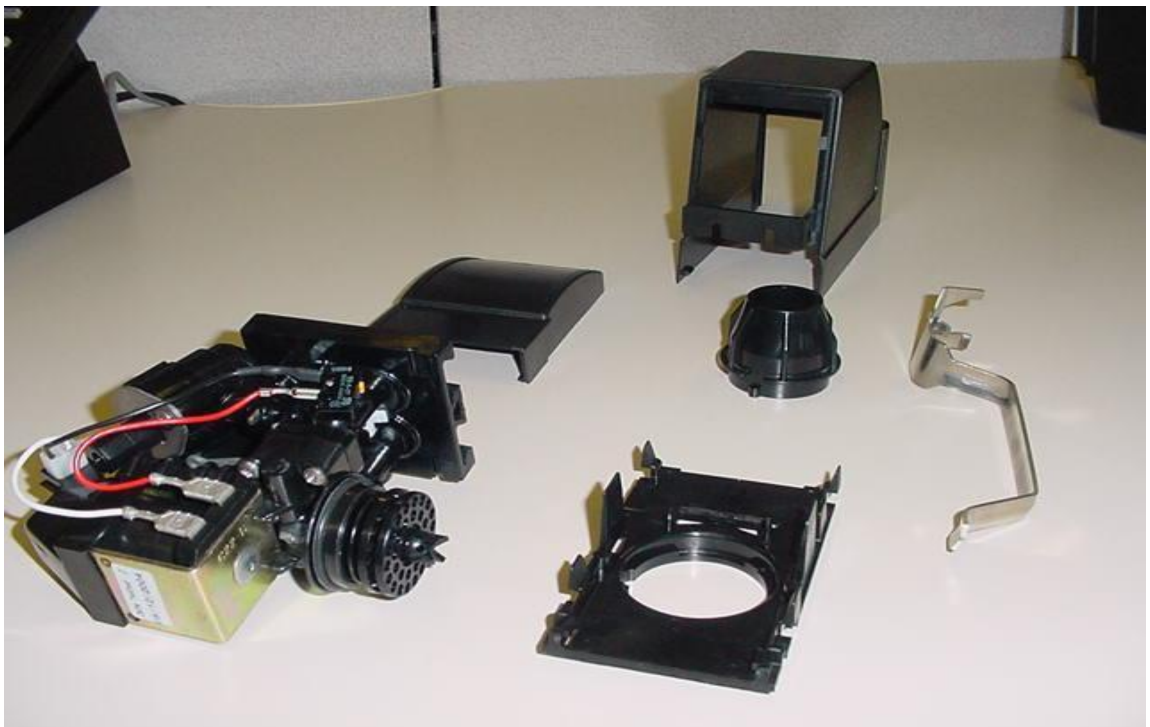
SFV-1 Features and Benefits

- Simplified installation and maintenance
  - Front access to flow regulators allow for quick and accurate brixing with superior repeatability
  - Modular snap-fit design for simplified maintenance
  - Easy to change flow rate and activation methods
  - Minimum number of fasteners allows for quick service
  - Self-contained flow control module and simple-to-adjust flow controls reduce set-up time
  - Improved warranty coverage for ice bev unts
  - Seamless warranty claims processing

Post-Mix System Components

SFV-1 Features and Benefits

Ease of Service (Example: replacing lever)



- 5 steps
- No tools required
- Time: approx. 35 seconds to disassemble and reassemble

Post-Mix System Components

SFV-1 Dispensing Valve Improvements

- Reliability / Serviceability
  - Heavy duty retaining plate (water hammer)
  - Longer/Stronger body screws (water hammer)
  - Improved Ratio Adjustment screws (Ease of Service)
  - Stronger ceramic materials (Durability)
- Drink Quality
  - Translucent flow control body (Durability and Taste due to discontinuance of Mold release agent)
- Performance
  - Improved Ceramic set design (Versatility / 30 – 110 psi)
  - Improved Solenoid design w/ red cover (Durability & ID)
  - Piston improved w/ wear additive to 1.2M+ cycles (Life Cost)

Post-Mix System Components

Dispensing Valve

Setting Water to Syrup Ratio

To assure that a post mix drink tastes the way the manufacturer intended, it is necessary to verify that the drink has the correct syrup to water ratio. This is accomplished by separating the syrup and water that is dispensed from the valve into a compartmentalized cup. The volume of the compartments will correspond to desired syrup to water ratio. For example, if a 5 part water to 1 part syrup ratio is desired, the water compartment in the cup will be five times larger that the syrup side.

We must also assure that the dispensing valve is set to the proper flow rate. Verifying the flow rate should be completed prior to setting the ratio.

Syrup Separator

Ratio Cup

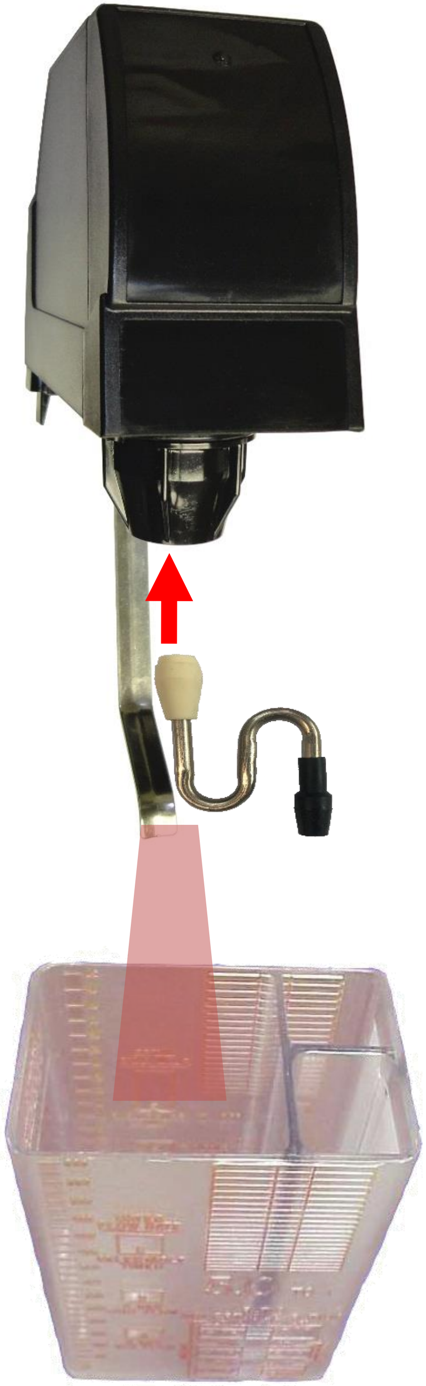
Post-Mix System Components

Dispensing Valve

Setting Water Flow Rate

To check the water flow rate:

1. Install syrup separator
   (push up, then twist clockwise)
2. Draw sample for designated time interval
   and check volume



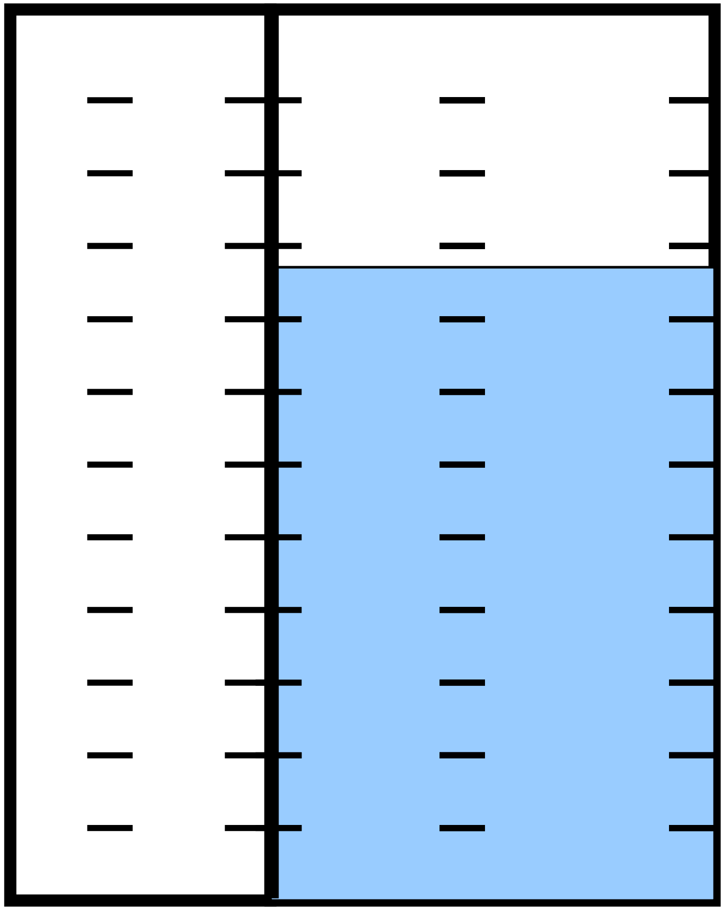
Post-Mix System Components

Dispensing Valve

Setting Water to Syrup Ratio

To achieve desired water flow rate:

- Turn adjustment screw clockwise to raise water level
- Turn adjustment screw counter-clockwise to lower water level



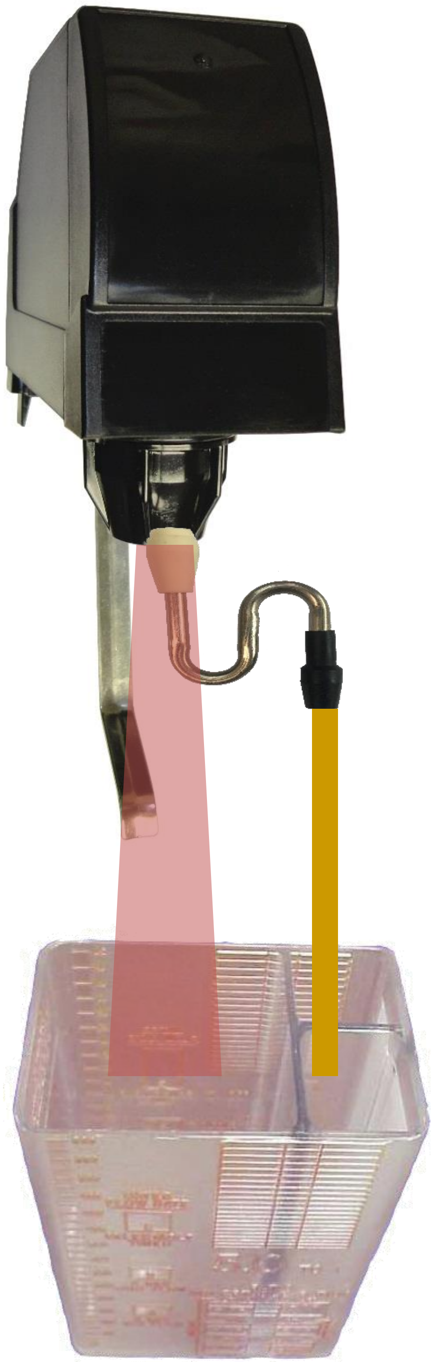
Post-Mix System Components

Dispensing Valve

Setting Water to Syrup Ratio

To check the ratio:

1. Dispense sample into correct compartment as shown



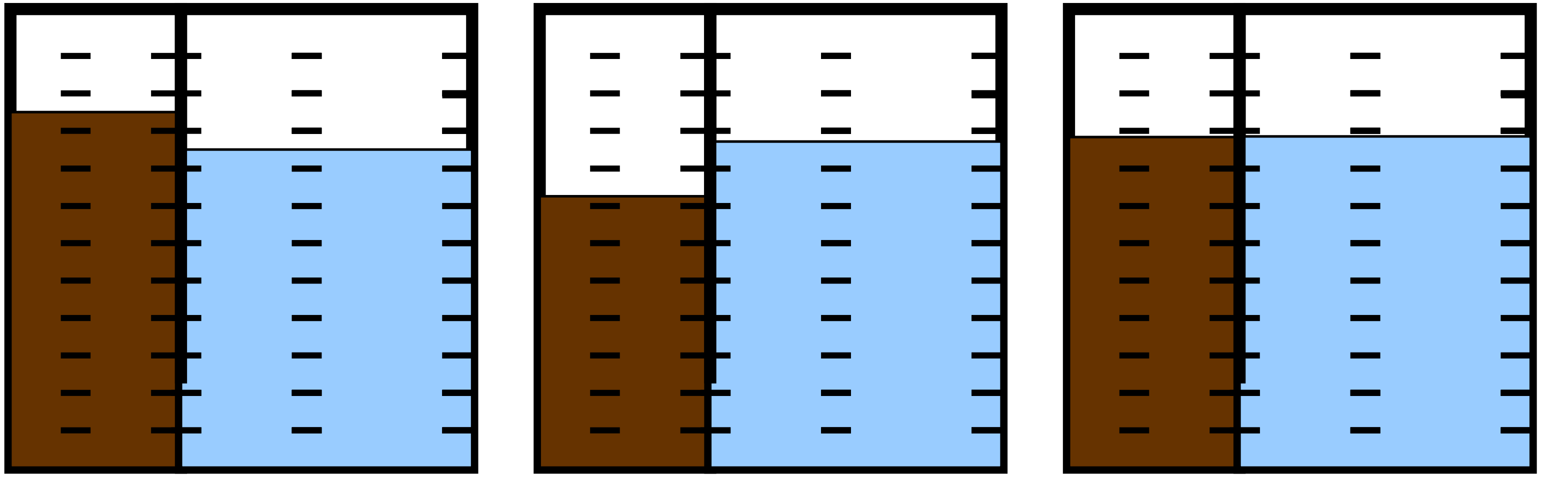
Post-Mix System Components

Dispensing Valve

Setting Water to Syrup Ratio

To achieve desired ratio, both syrup and water levels must be equal

- To raise level turn syrup adjustment screw clockwise
- To lower level turn syrup adjustment screw counter-clockwise



Too much syrup   Too little syrup   Just right

Post-Mix System Components

Dispensing Valve

Setting Water to Syrup Ratio

Some drink manufactures recommend different ratios for different products and conditions.

	Sugar	Sugar Free
No Ice	5.00:1	5.50:1
Hard Ice	4.75:1	5.25:1
Soft Ice	4.50:1	5.00:1

Post-Mix System Components

Dispensing Valve

Check the drink

Make sure the drink looks and tastes refreshing, then enjoy!

This concludes the seminar of

UNDERSTANDING POST-MIX SYSTEMS