

Install Guide

Serenity X-3



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Crysalli Beverage Systems a division of WPD 1739 Sabre Street, Hayward, CA 94545

www.crysalli.com

510.732.0100 05252022

CR-KIT-JRUC-X3 Install Kit Ordered Separately

Install Kit for CP-JR-UC-BH to X3 Tower

QTY		Description		Part Number	Usage	
	1		3/8 Tube x 9/26-24 Female Adapter	PSEI6012U9	Optional quick connect fitting adaptor to a 3/8" anglestop	
	4		JG 90 elbow 3/8" smooth to 3/8"	PP221212W	Water inlet and outlet connections on unit. Swival connections	
	2	Co	JG 1/2" mpt to 3/8"	CI321214S	JG fittings for Shurflo Water Reg inlet and outlet. Attached to Reg	
	3		JG Reducing union 3/8" to 5/16"	PI201210S	Reducing union, to connect product lines from faucet	
	1		9/26-24 to 3/8" Tube and 9/26-24 mpt	PASVPP6	Angle stop TEE in adaptor. For adding an outlet off the anglestop	
	1		Filter head 3/8 tube inlet & outlet	QL1	Manifold head for the water filter. Mount to cabinet wall	
	1		Water filter cartridge	2FC	Water filter, 1.5gpm, 6,000 gal capacity. Change at least once a year	
	1		Tube cutter	TSNIP	For cutting the 3/8" tube to needed lengths	
	1	-	8' Sleeve, 1/2" thick insulation	4463K133	Sleeve for insulation for 2 product lines to tower, 5/8 ID	
	1		15' Roll of Armaflex tape	1007	Insulation tape to wrap product and re-circ lines and tower	
	1		50 PSI Water Pressure Regulator	183-150-NF	Install after water filter system to regulate pressure feeding unit to 50 PSI	
	17	Ц	JG 3/8 Locking Clips	PIC1812R	Collet locking clip for 3/8" Hose to JG fittings	
	1		25' of 3/8"OD hose	PE-12-EI-25	Water Inlet and Product hose. Cut in 4 sections to needed lengths	
	1		Leak Block Sensor	CR-LBS10-JG	Leak detector to be installed before filter systems, includes fittings	
	4		15" Zip ties		For securing hose and water reg. to wall	
	1		High Pressure CO2 Regulator	CR-PC160	For connecting to CO2 tank. Controls CO2 pressure. Adjustable. Includes 1/4" nylon washer	

For questions or assistance with install contact Crysalli 510-732-0100 or your local Distributor.

Serenity System Description

Congratulations on the purchase of your Crysalli system. The Crysalli Serenity, made up of a CP-JR-UC-BH Undercounter chiller/carbonator, CR-12FC water filter system and a CP-X3PBWF faucet tower or a CBR-V2C-MINI tower is a configuration designed to dispense bottle quality cold sparkling, cold still and ambient temp still water at the press of a button or pull of a handle.

The Serenity CP-JR-UC-BH unit consists of a condensing unit (refrigeration), a manual fill water bath reservoir, water-cooling coil, a carbonator tank, a carbonator pump, an agitator pump, and cooling coils. The unit will freezer over 1/3 of the water in the reservoir/bath to create a 3 lbs ice block (bank). This ice bank is responsible for maintaining a 32-degree reservoir water temp. The cooling coils and carbonator tank are submerged in the reservoir/ bath water to chill and maintain ice cold product temperatures.

For proper function the Crysalli units must have a water supply, dedicated 120 Volt electrical supply and a full CO2 tank. The Installation kit including water filter, a high-pressure CO2 regulator, 50 PSI water pressure reducing valve, connecting lines and fittings that must be used to ensure proper operation.

WARNING: CO2 can be dangerous. Failure to connect the regulator per the instructions may result in leaks, explosions, asphyxiation and cause serious personal injury or death. Do not operate or place a Crysalli unit in a freezing ambient environment. A freezing ambient environment will cause water in unit to freeze and expand, possibly resulting in damage to pump/motor assembly, tank, water coil, water bath, valve(s), etc.

The detailed stuff: Theory of operation

The Crysalli Serenity System was designed to manufacture and dispense carbonated and non-carbonated water much like your local bottling plant that cans or bottles your favorite carbonated or noncarbonated water.

Initially water is filtered with sub-micron filtration to remove, sediment, chlorine, taste, odor and color, while retaining the naturally occurring minerals dissolved in the water for flavor. This filtered water is chilled and then carbonated to dispense a quality drink (ice-cold temperatures are key). To chill the water, the incoming filtered water is routed through a water coil that is submerged in the ice-cold water bath. The temperature of the incoming water is at ambient (room) temperature as it enters the water coil. As the incoming water passes through the water coil the heat is removed from the water and chilled to a temperature acceptable for a quality drink (34-40 degrees target). This chilled water is now routed into the equally cold and submerged carbonator tank where it is mixed with CO2. The carbonation pump must cycle on to jet water (at a higher pressure than the CO2) into the carb tank so the two can properly mix. This water is now transformed into sparkling water and ready for dispensing and enjoying.

Most of the above happens in the water bath part of the machine. The water bath is the sealed upper area where water is constantly agitated and a certain amount of it will be transformed into ice. This water bath and ice bank acts as a reservoir for refrigeration only (none the water in the bath is used for consumption) so you can have an ice cold and properly carbonated sparkling water to drink. Your Crysalli unit will cycle itself on and off as it maintains this ice.

It should be recognized that without refrigeration your carbonation system would not produce a drink that will hold carbonation. There is a direct relationship between dispensed temperature and the volumes of CO2 that can be held in liquid form (how bubbly your sparkling water can be). Thus, your Crysalli unit should be left on even when not in use so it can maintain the ice bank and cold temperatures.

The really detailed stuff: The following will give a general overview of the flow of individual circuits and

a clearer understanding of your mini bottling plant:

An Ice Bank Control (IBC, S0513A) senses the level of the ice in the water bath and turns on or off the refrigeration system. The IBC has a sensing bulb, cap tube and controller. The bulb is submerged in the water bath. There is fluid in the bulb that expands when the bulb is covered in ice. This pushes fluid through the cap tube that pushes a diaphragm that activates the switch in an open position to shut the refrigeration off. Once ice is dissipated from the bulb the fluid backs off, deactivating the switch (closing the circuit) and turns the refrigeration back on to rebuild the ice bank. The water that does not freeze in the water bath surrounds the Water Cooling Coils and Carbonator Tank (Carb Tank) and is constantly recirculating via the submerged Agitator Pump (S0833).

Ambient filtered water enters the Crysalli through the incoming water line. The incoming water should be regulated with the use of the 50 PSI water pressure reducer from the install kit. (If the water is not regulated to 50 PSI and the water pressure is equal or greater than the incoming CO2 the act of carbonation will be greatly inhibited or completely eliminated. Also, RO water, or water with little or no TDS, less than 30 ppm, will have a hard time carbonating the water and should not be used without consulting Crysalli technical support). This water proceeds through the water coil where it is chilled prior to entering the carb tank or in the case of non-carbonated water chilled prior to going directly to a valve.

Carbon dioxide gas (CO2) passes from a CO2 cylinder through high-pressure regulator. The high-pressure regulator (CR-PC160) regulates the CO2 feeding the Crysalli unit and should be set at 75 PSI. The gas, after leaving the high-pressure regulator goes directly to the carbonator tank. This gas must be at a pressure greater than the incoming water by at least 25 PSI to assure the proper function of the carbonator. Hence the inclusion of the 50 PSI water pressure reducing valve in the install kit.

The carbonator utilizes a soda jet recirculating principle. This process

was pioneered in the early 1950's. This principle produces instantaneous carbonation at extremely large capacities. Combined with "cold carbonations" (ice cold water with the carb tank submerged in the same ice cold environment) results in a superior sparkling water with small dense bulbs that retain in a glass of water for a long time.

The standing CO2 gas pressure stops the water from entering the carb tank by itself. So during the cycle of operation the water must be pushed with a carb pump/motor (S1523). The carb pump has pistons, which drives the water through the water coil, through a dual check valve, through the soda jet and into the carb 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 cold water entering the mixing tank causes all the water within to cascade and foamesce through the carbon dioxide gas area in a continuous recirculatingmanner.

This action causes a breakdown of the surface tension of the water, forming numerous minute gases filled water bubbles. The micro thin walls of these cold 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 it is monitored by a carb tank probe (S0073) that is in the carb tank. As the water level within the tank rises, it makes contact with the upper probe which will de-energize a relay on the liquid level control board and stop the motor from turning the pump. The carb pump/motor will be inactive until water within the tank recedes below the long probe tip, at which time, the relay on the liquid level control board will close, engaging the motor once again. You will notice the carb pump running as you pour sparkling water and stop soon after you are done pouring once it has finished refilling the tank.

All of the sensors and parts in your Crysalli unit are connected to and are energized by the liquid level control board (LLCB, part # S0068-U). This is the communication center for the system. telling each part when to turn itself on or off, such as the refrigeration system via the signal from the ice bank control or the carb pump/motor via the signal from the carb tank probe. The board also monitors if the carb pump/ motor runs continuously for too long, which is typically caused by starving the system of water as a result of a plugged water filter or the coils freezing over in the water bath (if the ice bank control stuck closed).

LLCB monitors the pump via a timer built into it that tracks the run time of the carb motor. If it runs for more than 4-8 minutes, the LLCB shuts the carb pump/motor down and illuminates the LED light near the on/ off switch to warn you it's in a safety for which the carb system is off. Resetting the safety, which turns the LED light off, and turns the carb system back on is achieved by toggling the on/off switch to the off position for 10 seconds, then back on.

Two items to note if your unit goes into this safety in which the LED light is on:

- 1. The refrigeration system stays on when in the safety, but since the carb system will be off, thus the machine will eventually just dispense CO2 gas and no water from the sparkling water faucet.
- 2. Also the safety being triggered can be a good indication that the water filter is plugged and needs to be changed out. The filter should be changed before resetting the safety limit.

Undercounter cooling system (the CP-JR-UC-BH only)

When installing the CP-JR-UC-BH in a cabinet, the following operations are very important:

Location of the cabinet: Since the CP-JR-UC-BH has a refrigeration system and carbonation pump in it, it will make noise when the refrigeration system cycles on and as you dispense sparkling water the carb pump will cycle on. So be aware of these ambient noises as standard function and don't place the unit in an area they are not wanted.

As the unit runs it will create heat, 585 BTU per hour (as a reference, 1 burning match creates 1 BTU, so image heat from 585 matches in the cabinet), so there should be some fresh air venation into and out of the cabinet as well enough space surrounding the chiller to ensure adequate air circulating through the refrigeration condenser. Do not block any of the vented panels on chiller.

The chiller should be located within 5' of the faucet. Water shut off valve/angle stop and dedicate 120-volt power outlet should be located as near the chiller as possible to facilitate install and service. Position the chiller so the condenser coil vent panel is closest to fresh air or the door of the cabinet.

Undercounter Chilled Water Dispenser Quick Installation Guide



How to make a Standard Connection using JG fittings Inch Polypropylene Fittings



To make a connection, the tube is simply pushed in by hand; the unique patented John Guest collet locking system then holds the tube firmly in place without deforming it or restricting flow.



Secures the collet in its position to prevent an accidental disconnection of the tube.

Locking clips should be connected only after full insertion to prevent scraping of the tube. Locking Clips are not designed for use with John Guest Stem Adapters in Swivel Combinations.

CUT THE TUBE SQUARE



Cut the tube square and remove burrs and sharp edges. Ensure that the outside diameter is free from score marks. For soft or thin-walled plastic tubing we recommend the use of a tube insert.

PUSH UP TO TUBE STOP



Push the tube into the fitting and up to the tube stop.

PULL TO CHECK SECURE



Pull on the tube to check that it is secure. Test the system before use.

TO DISCONNECT Push in collet and remove tube



To disconnect, ensure that the system is depressurized, push the collet square against the fitting. With the collet held in this position the tube can be removed.

Connecting the Angle Stop Adaptor Valve

To tee off an angle stop water valve that is already being used, locate the PASVPP9 angle stop adaptor tee. To connect the angle stop adaptor valve:



- 1. Shut off water supply at brass/chrome supply valve.
- 2. Disconnect riser from brass/chrome supply valve.
- 3. Ensure that the sealing gasket is fully inserted into the angle stop valve female thread.
- 4. Install angle stop adaptor valve on supply valve.
- 5. Connect the riser to the angle stop adaptor valve.
- 6. Fully insert tubing into the Speedfit side of the valve.
- 7. Open valves and check for leaks.



*Conversion adaptor can be threaded to either side of the valve to make configurations of 1/2"x1/2" NPS or 3/8"x3/8" compression.





For a dedicated angle stop water valve, use the PSEI6012U9 adaptor fitting.



To use the PSEI6012U9 angle stop adaptor, identify the angle stop water valve in your cabinet that will be the water source for the system, remove the compression nut and ferule ring from it and thread the PSEI6012U9 fitting onto the valve where the nut and ferule ring were, hand tighten the fitting down.



1/4 Turn valves. These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

DO NOT USE THESE VALVES:

- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or "faucet."

CR-X3PBWF Tower Faucet



requirements for tower: 1.125" - 1.25" Note that the threaded shank is 2.30" long. So depending on thickness of the countertop and under plywood base, the plywood may need to be trimmed or cut wider than the counter hole so the nut can be threaded on.

Inlet Connections from Angle Stop



Cut three 6' lengths of 3/8" hose for the carb water, ambient water and cold water hose connections. With a permanent marker or different color tapes, mark the ends of each hose about 3" down to differentiate them. Slide your carb water and cold water hoses into the 8' length of insulated tubing. Leave about 6" worth of hose exposed.

Locate the 3 PI201210S reducer union fittings and 6 of the red clips. Once the tower is mounted to the counter, push the smaller (5/16) side of the fittings on to the faucet hose ends. Then push the blue hoses into the larger (3/8) end of the fittings. Apply the red clips to the fitting collets. After all the connections are made, slide insulation tubing over fittings and up the hose as high up as possible. Use insulated tape role to wrap exposed cold product lines after the system is leak tested.



Match your connections

Chiller Label	to	Faucet Labe
Carb water	=	Soda
Ambient water	=	Water
Plain water	=	Cold water

Use the red locking clip at all hose to fitting connections. After all connections are made turn on the water to the unit and check all connections for leaks then wrap all exposed hoses and fittings with the insulated tape. Failure to do so can result in sweating of the cold water product lines and water drips.





Draw rate	1-8 oz/min	Total drinks < 45	40
Compressor	1/8 HP	Ice bank	3 lb.
Water bath	1 gallon	Electrical	120-volt 60-hz
Carbonator	1.5 - GPM	Shipping weight	60 lb.
		Dry weight	47 lb.

Serenity CR-JR-UC Connections with X-3 Faucet

With the connections made at the faucet, cut back some the insulated tube at the other end to match the length of hose and then push it back to expose the hoses for connection to the chiller. If the total length of the two hoses is too long, it should be cut back to an appropriate length (always leave slack in the hose in case the unit needs to be moved), also re-mark the hose end to identify the matching connection at the tower.

Locate 3 swivel elbow fittings and red clips, these should be used to decrease tension on the hoses when connected to the bulkhead of the chiller. Push the fittings onto the hose ends and place the locking clips on the fitting collet just as you did at the tower end.

Push the assembled hose and fittings into the bulkhead connections for carb water, plain water (cold) and ambient water on the chiller. Pull the insulation down over the fittings. After water is turned on to the unit, go back and check fittings for leaks and wrap all exposed hose and fittings with insulated tape to prevent sweating from them.











Match your connections Chiller Label to Carb water = Ambient water =

=

- Faucet Label
- Soda
- Water
- Cold water

Use the 3 remaining PP221212W swivel elbows on the outlet connections.

Push assembled hose and fittings into bulkhead connections on chiller

Pull Insulated sleeve down fittings.

Use insulated tape to wrap over hose and the fittings and exposed hose. Wrap them well to insulate.

CR-12FC Filter System

Flow Rate: 1.5 gpm

Capacity: 6,000 gallons

Effectively filters dirt and particles as small as 1/2-micron in size by mechanical means.

Reduces chlorine taste & odor and other offensive contaminants that can adversely affect the taste and quality of sparkling and still water.

NSF/ANSI standard 42 class I and 53 certified to reduce cysts such as Cryptosporidium and Giardia by mechanical means.

Replace cartridge when flow rate becomes inconveniently slow from faucet or at least once per year.

50 PSI Water Pressure Reducer Valve

Install after the water filter system close to the chiller.

Reducer valve is directional. Arrow on valve indicates water flow direction. Failure to install in the correct direction will result on no water flow.

Do not over tighten fittings. Fittings have an O-ring gasket, so Teflon tape is not required.





*Always reference local plumbing codes to determine if a backflow preventer is required and to check the type/style of backflow preventer that is accepted as well as the plumbing location it needs to be placed in.

Crysalli does not include backflow preventers in the install kits because of variability in requirements.

Backflow devices should be sourced from local plumbing stores.

CR-LBS10JG Kit



Leak block control unit sensor Solenoid latch valve 9V battery John Guest fittings

Operating Instructions Installation:

- Install the 3/8" fittings to the solenoid valve inlet and outlet ends. The thread of solenoid valve is 1/2" BSP male. Then connect a 3/8" OD tube from the angle stop to the inlet fitting on the solenoid valve (indicated by position of the arrow). Then connect a 3/8" OD tube from the outlet end of the solenoid to the water treatment system that is feeding your Crysalli CP2000 unit.
- 2. Put the 9V battery in the control unit and activate it by holding the check/reset button for 4 seconds (see operation instructions for more details).
- 3. Place the control unit next to your Crysalli unit, ideally between the filter system and chiller.
- 4. Turn on water and check for leaks at your connection points.

Operation:

- Reset to work

 a) Keep pressing button for
 4 seconds, the control unit
 activates solenoid valve to
 open the inlet tube of water
 treatment system, and
 generates a long beep sound.
- 2. Auto shut-off when water leak is detected.

a) The control unit shuts activate solenoid valve to shut off the inlet tube of the water treatment system to block water flow, and generates an acoustic signal, "beep-beep," and blinks the blue light continuously to notify the water leak is detected. After the leakage problem is solved, keep pressing button for 4 seconds, the control unit activates solenoid valve to open the inlet tube of water treatment system again with a long beep sound.

Low power shut-off

 When the battery power
 is low, the control unit shuts
 off the inlet tube of the water
 treatment system, blinks red
 light and generates an acoustic
 signal "beep" to notify that the
 battery needs to be replaced
 to keep water leak protection
 functional.

Connecting CO2 and Filling Water Bath

Step 1: The hose for the CO2 connection is 6' long, 1/4" braided hose with a 1/4" flare nut on the end extending out from the chiller near the water inlet. Route this hose to the location of the CO2 tank. Locate the CR-PC160 primary high pressure CO2 regulator. Unbox it and be careful to locate the 1/4" nylon washer taped to the packaging. Insert this washer into the flare nut on the end of the hose and thread it on to the 1/4" mpt flare on the CO2 reg. Use a wrench to tighten it on. Locate paper washer with CO2 tank and thread CO2 reg to tank, making sure its tight.



Step 2: Remove the lid of the unit to expose the water bath. This is a sealed chamber designed to hold 1 gallon of water that is used to chill the product water hoses and carb tank.

Manually fill the water bath up with 1 gallon of water, up to the White stand pipe.

Overflow of water will drip into the SS drip tray as water freezes.

Once turned on the water bath will freeze a block of ice over the refrigeration coils on the side.

Give the unit an 1.5 –2 hours to freeze a full ice bank. Unit will cycle on and off to maintain ice bank. Empty any water that drained into the SS drip tray.

Check water bath every 6 months and top off it needed. Once a year, drain, clean and refill.

Start-up sequence:

- 1. Make all connections to unit and from unit to faucet.
- 2. Place battery in leak detector and position sensor near chiller and water filter.
- Connect the CO2 reg to the CO2 hose (use the 1/4" nylon washes supplied with the regulator, for the flare fitting on the braded hose). Connect the reg to a CO2 tank. Do NOT turn the CO2 on yet.
- 4. Fill the water bath with 1 gallon of water and replace lid on unit.

- 5. Turn the water on to the unit. Check for leaks.
- 6. Draw about a gallon of water from the still chilled or ambient water valves until water is flowing without sputtering to flush the water filter of air.
- 7. Plug the unit in and toggle the power on.
- 8. Turn the CO2 on at the tank. Set CO2 pressure to 75 psi. Tighten any CO2 fittings that are leaking.
- 9. Draw water from the sparkling button on the faucet. Run about a

gallon of water till you visually see carbonation in the water. The carb pump will run as you draw carb water.

ACTURED R. 2013

Flare nut with nylon

washer in it

CR-PC160

CR-S115

- 10. Water bath will need an 1.5-2 hours to form full ice bank. At this point run more sparkling water to check carbonation level of the water and make your flow rate adjustments at the chiller to meter down the force of flow.
- 11. Enjoy fresh cold sparkling and still water at a push of the button.



CO2 Information

CO2 tanks can be sourced and refilled from local beverage CO2 companies (both bulk and/or tank) and welding supply companies. On average, 1lb of CO2 will be used for every 5 gallons of sparkling water. A 20lb tank should carbonate 100 gallons (12,800oz or 378 liters) of sparkling water.





WARNING: CO2 can be dangerous. CO2 cylinders contain high pressure gas which can be hazardous if not handled properly. Follow all CO2 regulator instructors (found with CO2 regulator) and other handling instructions from the CO2 tank supplier.

Attaches to 5-100lb CO2 tanks. Set at 75 PSI as a starting point.

Note: Low-pressure beer regulators 0-60 PSI will not work properly with Crysalli.

Output pressure gauge: Shows CO2 output pressure settig. Set to 75 PSI.

Fill level gauge: Volume of CO2 in tank. Tank is empty when needle is in the red zone or zero.

Threaded connection to CO2 tank.

1/4" Male flare connection to Crysalli chiller. Use nylon washer supplied with regulator in fitting. Pressure adjustment screw and locking nut.

CR-PC160 High Pressure CO2 Regulator 0-160 PSI



<u>Crysalli Serenity Cleaning and Maintenance</u> <u>Recommendations</u>

Daily:

- Wipe down the unit or draft tower, cleaning and drying all surfaces. (Use window cleaner on mirrored and chrome finishes).
- □ Check flow from faucet, loosen, readjust, and tighten flow control knob as needed. Note that the sparkling water can come out more forceful after prolonged non-use.
- □ Check that flow, temperature and carbonation of water poured from the unit are consistent to average use.

Monthly:

□ Check CO2 level at CO2 tank. A 5 lbs CO2 tank can last up to 3 months with moderate volume use. If sparkling water is no longer carbonated, this is an indication the CO2 tank is empty and should be replaced.

Quarterly:

- □ Inspect and clean any dust from the condenser coils on chiller (use compressed air or a wire brush, avoid any damage to the coil fins).
- □ Check the water bath level, either top off or drain, clean and refill.

Semianually:

- Drain water bath, clean and refill with new water (pull white stand pipe inside water bath to drain water. Be sure have a container under the ss drain spout at the front of the unit to catch the draining bath water). Remember to replace the dip tube before refilling the bath.
- □ Check for drop off in water pressure from the cold and ambient water at the faucet. This will be an indication that the water filter is plugging with debris and should be changed. Use only 2FC replacement filter cartridges. (The sparkling water should not slow down its flow as the filter begins to clog. A plugged water filter will result in the sparkling water gassing out as it is pouring. Or only dispensing CO2 gas. If the system does not dispense water and only gas then check if the LED light is on at the chiller. This is a safety warning that the water flow is plugged. Check the water filter or ice bank in water bath. Turn the unit off for 10 seconds then back on once water flow issue is resolved to reset safety).

Annually:

- □ Inspect internal water bath components such as agitator pump, CO2 and water inlet. Check valves on carb tak, bleed valve on carb tank and all hose connections.
- □ Change water filter. Use only 2FC replacement filter.



Crysalli Beverage Systems a division of WPD 1739 Sabre Street, Hayward, CA 94545

510.732.0100

Model Number:

Install Date:

Serial Number:

Installer/Servicer: