

Technical Manual Commercial Plus Series



Models:

CP 208s OD
CP 210s OD
CP 213s OD
CP 216s OD

CP 208r OD
CP 210r OD
CP 213r OD
CP 216r OD

COMMERCIAL PLUS

manual part number: 11160 A
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About this Manual

This manual will cover information needed for the proper installation and operation of your Kinetico Softening System. We have also included information regarding the frequently asked questions about softening systems. This information may be more technical in nature, but provides further insight to the continued operation of this equipment at its highest levels.

This manual will use various icons to help highlight issues that are relevant to the safe operation of this equipment. The following icons will be used as described:



General information regarding the application of this product will be highlighted by this icon. This will include technical specifications and expected operational results.



A caution icon will be used to present any information that may hold a potential hazard or concern during the installation, use or maintenance of this product. **Should this information not be followed, it may result in damage to this equipment and its surroundings.**



The warning icon will be used to present any information that may result in a severe hazard or concern during the installation, use or maintenance of this product. **Should this information not be followed, it may result in severe physical harm.**



Any tools or materials required during the installation, use or maintenance of this equipment will be preceded by this icon. Using these specific tools will minimize time and effort. Not using the proper tool may result in damage to this equipment, its surroundings or even physical harm.

If there are any additional questions pertaining to this equipment, please contact your local Kinetico Dealer for further assistance.

The Commercial Plus Series

The CP Series provides continuous soft water for commercial applications. The unique design of Kinetico's control valve, allow for all softener functions to operate fully automatically, and non-electrically. The system has a number of options as described:

(OD) – Overdrive

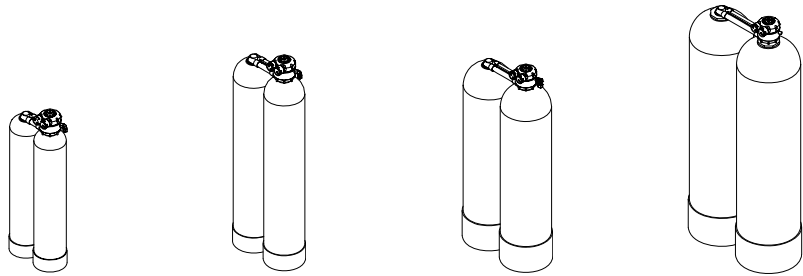
The Overdrive feature provides for both tanks on-line during service. During regeneration, one tank is in service and provides water to the regenerating tank. All CP system are shipped in the Overdrive mode. The alternating disc is also included. To apply a (s) standard flow configuration, the OD version is purchase and modified at the time of install.

(s) – Standard

The standard softener configuration provides duplex tanks and control valve. The control valve operates fully automatically, with all service and regeneration functions being performed based on operating pressure. The brining system is not included with the standard package. This allows for a variety of brine tanks to be added as an option.

(r) - Remote Start

The remote start option is similar to the standard configuration with the exception of the function of the control valve. With the remote start, the system control is only initiated by an external hydraulic signal. With allow control of the timing of regeneration by an external device.



Specifications

Product Name	CP 208s OD	CP 210s OD	CC 213s OD	CC 216s OD
Overdrive Flow (15/30 psig)	20.5 - 30.0 gpm	21.1 - 31.6 gpm	28 - 40 gpm	35.0 - 47.0 gpm
Alternating Flow (15/30 psig)	11.5 - 18.0 gpm	12.0 - 19.0 gpm	20.0 - 30.0 gpm	23.0 - 33.0 gpm
Tank Size	8" x 40"	10" x 54"	13" x 53"	16" x 65"
Resin Volume per Tank	0.7 ft ³	1.5 ft ³	2.5 ft ³	4.0 ft ³
Under Bedding	None	None	24 lbs. Gravel	24 lbs. Gravel
Upper Distributor	0.014" Slotted Hub	0.014" Slotted Hub	0.012" Slotted Hub	0.012" Slotted Hub
Lower Distributor	0.014" Slotted Hub	0.014" Slotted Hub	0.012" Slotted Hub	0.012" Slotted Hub
Service Flow Direction	Down Flow	Down Flow	Down Flow	Down Flow
Regeneration Flow Direction	Up Flow	Up Flow	Up Flow	Up Flow
Maximum Tank Capacity	16,630 grains	42,611 grains	70,000 grains	112,000 grains
Meter Gearing	3,171 gallons	3,829 gallons	8,922 gallons	15,192 gallons
Flow Nozzle	Full Louver	Full Louver	Full Louver	Open Louver
Minimum Flow Rate	0.75 gpm	0.75 gpm	0.75 gpm	1.1 gpm
Regeneration Volume	35 gallons	102 gallons	142 gallons	160 gallons

CP 208 - 8x40" Tanks

Part Number	Model	Description
11701	CP 208s OD	Commercial Plus Softener, 8x40" Tanks, Overdrive, 18x35" Brine Tank
11700	CP 208s OD	Commercial Plus Softener, 8x40" Tanks, Overdrive, No Brine Tank
11702	CP 208s OD	Commercial Plus Softener, 8x40" Tanks, Overdrive, EMPTY
11370	CP 208r OD	CP Softener, 8x40" Tanks, Overdrive, Remote Start System, No Brine Tank

CP 210 - 10x54" Tanks

Part Number	Model	Description
11704	CP 210s OD	Commercial Plus Softener, 10x54" Tanks, Overdrive, 18x35" Brine Tank
11703	CP 210s OD	Commercial Plus Softener, 10x54" Tanks, Overdrive, No Brine Tank
11705	CP 210S OD	Commercial Plus Softener, 10x54" Tanks, EMPTY
11376	CP 210r OD	CP Softener, 10x54" Tanks, Remote Start System, No Brine Tank

CP 213 - 13x54" Tanks

Part Number	Model	Description
11750	CP 213s OD	Commercial Plus Softener, 13x54" Tanks, Overdrive, 24x40" Brine Tank
11180	CP 213s OD	Commercial Plus Softener, 13x54" Tanks, Overdrive, 24x40" Brine Tank, Media Separate
11153	CP 213s OD	Commercial Plus Softener, 13x54" Tanks, Overdrive, No Brine Tank, Media Separate
11190	CP 213s OD	Commercial Plus Softener, 13x54" Tanks, Overdrive, No Brine Tank
11184	CP 213s OD	Commercial Plus Softener, 13x54" Tanks, Overdrive, No Brine Tank, No Media
11181	CP 213r OD	CP Softener, 13x54" Tanks, Overdrive, Remote Start System, 24x40" Brine Tank
11161	CP 213r OD	CP Softener, 13x54" Tanks, Overdrive, Remote Start System, No Brine Tank, No Separate
11191	CP 213r OD	CP Softener, 13x54" Tanks, Overdrive, Remote Start System, No Brine Tank
11185	CP 213r OD	CP Softener, 13x54" Tanks, Overdrive, Remote Start System, No Brine Tank, No Media

CP 216 - 16x65" Tanks

Part Number	Model	Description
11182	CP 216s OD	Commercial Plus Softener, 16x65" Tanks, Overdrive, 24x40" Brine Tank, Media Separate
11168	CP 216s OD	Commercial Plus Softener, 16x65" Tanks, Overdrive, No Brine Tank, Media Separate
11186	CP 216s OD	Commercial Plus Softener, 16x65" Tanks, Overdrive, No Brine Tank, No Media
11183	CP 216r OD	CP Softener, 16x65" Tanks, Overdrive, Remote Start Systems, 24x40 Brine Tank
11175	CP 216r OD	CP Softener, 16x65" Tanks, Overdrive, Remote Start Systems, No Brine Tank, No Separate
11187	CP 216r OD	CP Softener, 16x65" Tanks, Overdrive, Remote Start Systems, No Brine Tank, No Media

CP Brine Tanks

Part Number	Model	Description
7938	18 x 35	250 lb. Salt Capacity
10586	24 x 40	500 lb. Salt Capacity

Sizing

Continuous Service Flow Charts

#	Not recommended for 24-hour continuous flow.
#	Caution when applying in applications requiring 24-hour continuous flow.
#	Recommended for 24-hour continuous operation.

		CP208s OD																																									
		gpg	mg/l	°dH																																							
Water Hardness	30	513	17.7	8	8																																						
	29	496	17.1	8	8	8																																					
	28	479	16.5	8	8	8																																					
	27	462	15.9	8	8	8																																					
	26	445	15.3	7	7	8																																					
	25	428	14.8	7	7	7																																					
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	1	17	0.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1																										
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				Continuous Flow Rate																																							

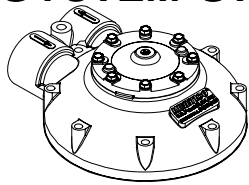
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Continuous Flow Rate

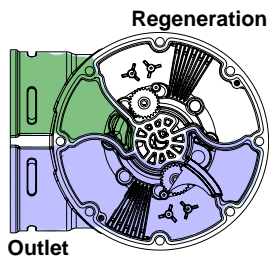
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	lpm		4	8	12	16	19	23	27	31	35	38	42	46	50	53	57	61	65	69	72	76	80	84	88	91	95	99	103	106	110	114	118	122	125	129

Continuous Flow Rate

SYSTEM OPERATION



Kinetico Water Conditioners use a twin tank design to assure that treated water is always available. When one tank regenerates, the other supplies treated water. The Kinetico Valve, controls when each tank is in service, when each tank must be regenerated and the regeneration of each tank. Two sizes of valve are available, the Mach 1000 and Mach 1250 valves. Mach 1250 valves are used with the CP Series.



Level One Operation

Level One assembly consists of three chambers: inlet, outlet and regeneration chambers.

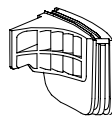
Hard water enters the inlet chamber and travels to the media tank where it is treated. Treated water moves from the media tank to the outlet chamber. Contained in the outlet chamber is a water meter turbine, which turns only when water is used. Gears connect the water meter turbine to the water meter disc. The system's meter gearing is defined as the volume of processed water needed to turn the water meter disc 360°.

Flow Nozzle

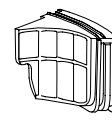
Accuracy and range of the flow meter will depend on the nozzle used with the system. Most units incorporate the half louver nozzle. This nozzle gives will a highly accurate and wide range of flow metering capability. If an alternative nozzle is used, a different meter volume per 360° on the water meter will result. To estimate this new volume, use the Meter Ratio Multiplier to determine new volume. The Half Louver Nozzle is standard with all CC Ssystems.



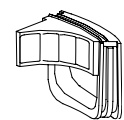
Micro



Half Louver



Full Louver

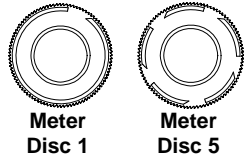


Open Louver

	10880	11018	11019	11188
Part Number	10880	11018	11019	11188
Min. Flow Range	0.05 gpm	0.5 gpm	0.75 gpm	1.10 gpm
Max. Flow Range	5.00 gpm	25.00 gpm	40.00 gpm	50.00 gpm
Meter Ratio Multiplier	<0.5 : 0.105 >0.5 : 0.428	1	2.22	3.78

Gearing Volumes	Micro	Half Louver	Full Louver	Open Louver
2-2-2-3	144	342	759	1,293
2-2-1-P5	160	381	846	1,440
2-2-7-P6	245	583	1,303	2,213
2-2-3-P4	276	657	1,470	2,497
2-1-5-P4	307	732	1,689	2,785
2-7-6-P4	470	1,119	2,520	4,280
2-3-4-P4	526	1,253	2,843	4,829
1-5-4-P4	591	1,408	3,171	5,322
7-23-23-P6	720	1,715	3,829	6,483
7-6-4-P4	911	2,168	4,873	8,195
3-4-4-P4	1,021	2,431	5,498	9,189
P20-P20-P14-P14-P14-P17	1,517	3,612	8,019	13,653
P20-P20-P14-P14-P13-P12	1,688	4,019	8,922	15,192
P20-P20-P14-P14-P15-P16	2,595	6,178	13,715	23,353
P20-P20-P14-P14-P17-P11	2,927	6,970	15,473	26,347
P20-P20-P14-P14-P13-P11	3,265	7,774	17,258	29,386
P20-P20-P14-P15-P16-P11	5,018	11,948	26,525	45,163
P20-P20-P14-P17-P11-P11	5,675	13,513	29,999	51,079
P20-P20-P13-P12-P11-P11	6,315	15,035	33,378	56,832
P20-P20-P15-P16-P11-P11	9,705	23,108	51,300	87,348

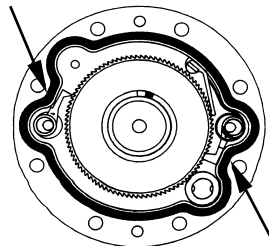
Water Meter Disc



The frequency of regeneration can be adjusted without re-gearing the system. The use of the water meter disc provides for multiple regenerations per 360° cycle on the water meter. Each regeneration notch on a water meter disc will initiate a regeneration when the regeneration start pawl drops into one of these segments and engages with the teeth of the control disc. The number of regenerations within the 360° cycle is indicated by the number of the water meter disc.

Regeneration Pawls

Regeneration drive pawl

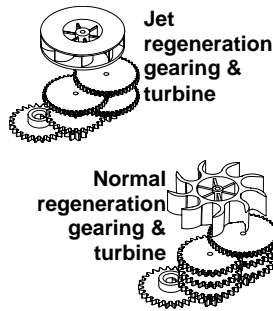


Regeneration start pawl

It is important to realize that there are two regeneration pawls: the regeneration start pawl and the regeneration drive pawl. The regeneration start pawl advances the control disc enough to open the regeneration control valve. The water meter and control disc advance together until the control disc uncovers one of the holes in the ceramic disc located directly beneath the control disc. This opens the regeneration control valve, which starts regeneration. Once the valve has opened, the regeneration drive pawl continues to advance the control disc through the regeneration cycle.

When open, the regeneration control valve allows water to pass through a nozzle where it is directed to the regeneration turbine in the regeneration chamber. As the regeneration turbine spins, it drives the regeneration drive pawl, which advances the control disc.

Jet Regeneration



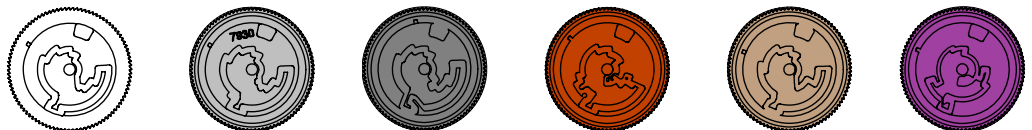
During the regeneration, water is used by the valve to control the sequence. For units equipped with *Jet Regeneration*, a 0.2 gpm regeneration flow control is used to limit the amount of water used. In addition to this small flow control, the regeneration nozzle in the level 2, and the regeneration turbine in the level one are also modified to accept these lower flow rates.

In non-Jet systems, a 0.4 gpm flow control, standard regeneration nozzle and an open regeneration turbine are used.

The Jet feature is included with all CP Systems.

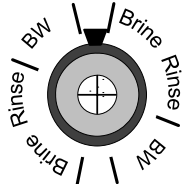
Control Disc

All internal valve positions are controlled by the Control Disc. As the control disc turns, it covers and uncovers holes in the ceramic disc (located directly below the control disc), sending pressure signals to open and close all internal valves. The sequence of regeneration and service configuration (alternating or Overdrive) is based on the type of control disc installed.



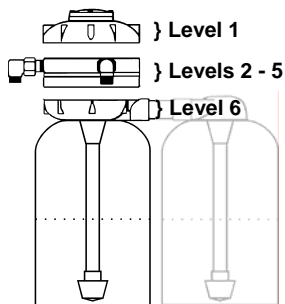
	White 4689*	Gray 7931	Black 4700	Orange 8637	Tan 5565	Purple 8635
PN	4689*	7931	4700	8637	5565	8635
Service Flow	Alternating	Alternating	Alternating	Overdrive	Overdrive	Overdrive
Regeneration Sequence:						
Backwash	--	3 %	--	12 %	--	--
Brine • Slow Rinse	75 %	60 %	60 %	57 %	76 %	--
Backwash	25 %	37 %	40 %	12 %	24 %	65 %
Purge	--	--	--	7 %	--	25 %

Control Disc Indicator



A visual indicator on top of the control disc (black dot) shows the state of the system at any time. The control disc rotates clockwise. When the indicator dot is at the 12 o'clock position, the Remote Tank is in service. When it is between the 12 o'clock and 6 o'clock positions, the Remote Tank is in regeneration. When the indicator dot is at the 6 o'clock position, the Remote Tank is in service. When it is between the 6 o'clock and 12 o'clock positions, the Main Tank is in regeneration.

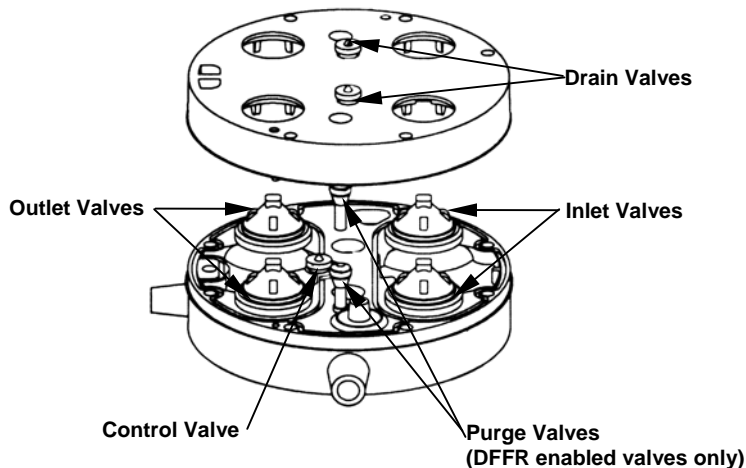
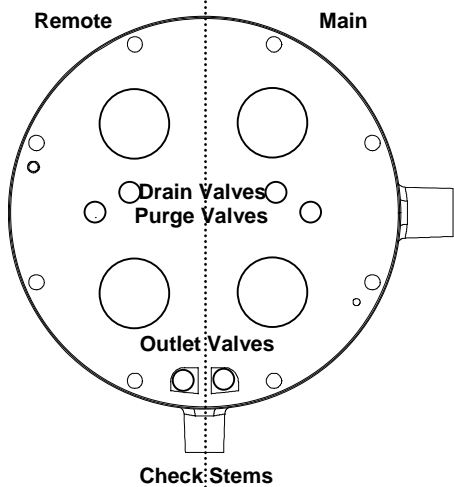
Lower Valving Section



The lower valving section consists of Level Two, Level Three, Level Four and Level Five assemblies.

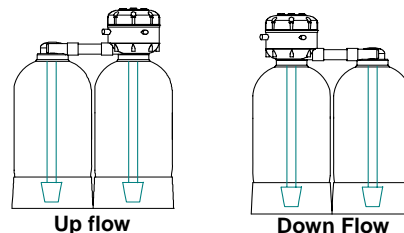
In the center, there is on regeneration control valve. This valve opens after 4 teeth on the control disc have engaged. This valve then opens, and powers the regeneration cycle.

All of the other valves are pairs: one set for the Remote Tank and one set for the Main Tank. For each media tank, there is an Inlet, Outlet, Drain and Check Stem valve (also a down flow rinse valve on DFFR enabled systems.) The Inlet, Outlet and Drain valves are all servo valves controlled by the control disc. The Check Stems are simple one-way valves (check valves). Together, these valves control the flow of water into and out of each media tank during service and regeneration.

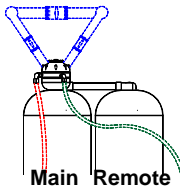


Level 6

The final level of the valve is used to direct the normal service path of the water. This can be either down-flow or up-flow. Since all regenerations are counter-current, choosing the service direction also specifies the regeneration direction. Down-flow service is used with standard, non-packed tank systems. For high efficiency, packed tank systems, Up-flow service is specified.



System By-Pass

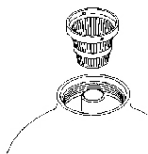


For each system, a by-pass is recommended. This can be installed using three ball valves. This allows the system to be isolated during any service operations. By-pass valving is not included as a part of the system package.

Resin Tanks

Each system uses two resin tanks. The main tank includes the Mach control valve. The secondary tank is referred to as the remote tank.

Upper Distributor



The distributor prevents channeling of the inlet stream into the top of the resin bed. A plastic molded distributor is attached to the top of the control valve. The distributor also prevents resin from backwashing out of the tanks.

Riser Tube

A riser tube is used to connect the lower distributor to the control valve. The riser tube is 1.0" in diameter.

Distributors

The lower distributors are of a slotted hub design. This cone, provides for excellent flow distribution through the resin bed.

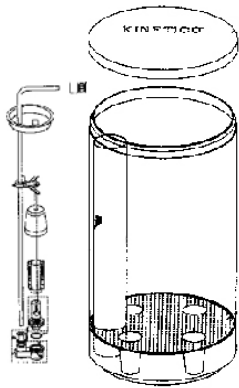
Media

High capacity, uniform bead resin is used in the compact commercial softeners. The resin has a capacity of 30,000 grains per cubic foot when regenerated at a brine setting of 15 lbs./cubic foot.

Tank Interconnection

Each twin tank system uses a set of inter-connectors to provide a water path from the main control valve to the remote tank. This interconnecting plumbing is included with the system package. It uses a double o-ring seal to provide a leak-free connection. A connector link and pins hold the tanks together under pressure.

Brine Tank



Required with a standard system is a brine make-up tank. These tanks will accommodate loading of softener grade salt and provide water to dissolve brine into a saturated liquid form.

Softened water is delivered to the brine tank by the control valve during the normal regeneration sequence.

Brine tanks include an overflow connection to allow for a safety in case of tank overflow.

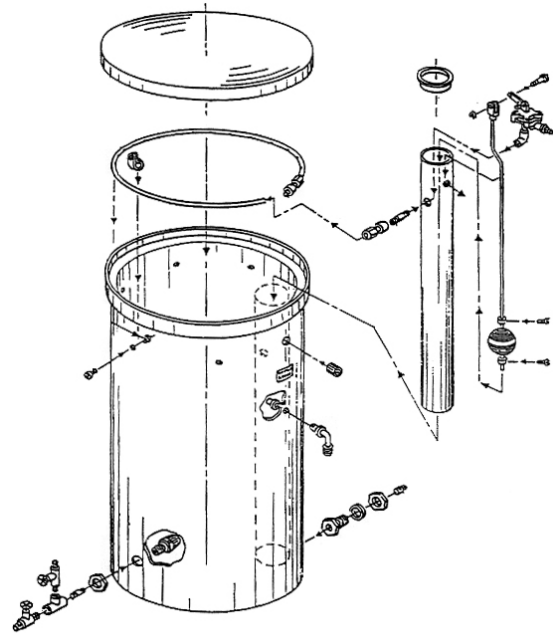
Also included with the brine tank is the brine valve. The brine valve is used to adjust the volume or brine to be produced for each cycle.

Central Brine System

For larger, multiple systems, a Central Brining System alternative is available. This will replace the need for multiple brine tanks when installing multiple units in parallel.

The Central Brining System has features similar to the independent brine tanks; however, to accommodate multiple systems, the brine refill is accomplished by a float mechanism attached to the softened water supply outlet of the system.

A check valve must be added to each softener on the brine line for the unit to operate properly with the Central Brining System.



Valve Modifications for Central Brining Operation

Depending on the CP unit selected, the Venturi Throat and Brine Flow Control may need to be changed. This will regulate the amount of salt used per regeneration.

Unit	No Modification		Recommended Valve Change	
	Throat	Salt per Cycle	Throat	Salt per Cycle
CP 208	Tan (3342)	8.5 lbs.	Dark Blue (2117)	5.5 lbs.
CP 210	White (2120)	30 lbs.	Tan (3342)	10.5 lbs
CP 213	Yellow (6016)	42 lbs.	Clear (2379)	19 lbs.
CP 216	Yellow (6016)	42 lbs.	Black (1045)	35 lbs.

Getting Started

The following procedures have been developed to assist during the installation of your Kinetico Softener.



ALL STATE AND LOCAL PLUMBING CODES MUST BE MET, including, but not limited to:

- Distances that equipment should be placed from the main panel box and electrical outlets.
- Air gaps that must be provided for all drain lines.

Pre-installation Review

Before beginning the installation of the Kinetico system, confirm system configuration to be installed and components that have been ordered. Please review Kinetico specification sheet that includes required components.

Review of the customer's facility is also recommended, especially critical operating data that could affect the operation of the system:



Water pressure to the Kinetico system affects the performance during regeneration. The Kinetico system will not operate properly if the inlet pressure fluctuates below a dynamic pressure of 25 psi. This minimum pressure must be maintained to the system at all times. Should the pressure fluctuate below this level, a booster pump may be required.



Do not use on water pressure that exceeds 125 psi or water temperature that exceeds 120° F.



Do not install the Kinetico Softener in an area where the temperature can cause the unit to freeze. Damage to the system will result.



It is recommended that a WQA certified installer perform the installation. Failure to install the system as instructed will void the warranty.



Proper ventilation must be provided when using PVC cleaner or glue.



A ladder should be used for all work overhead that would be beyond your natural reach. If working continuously at a height of six feet or more, the appropriate safety devices must be employed.



An appliance dolly should be used when transporting equipment on stairways.



When soldering, the following must be met and followed:

- LEAD FREE solder must be used.
- PVC containers and other flammable materials must be closed or removed to prevent fire or explosions.
- Loose clothing (ie: shirts tails, sleeves, etc.) should not be worn or should be addressed before using a torch for soldering.

- The customer must be notified if you will be disabling smoke alarm(s) during installation. Be sure to reconnect the smoke alarm(s).
- A scorch pad must be used to protect any surface that may be exposed to a torch flame or excessive heat. Wear protective eyewear while installing to prevent eye injury caused by splattering soldering materials or metal/plastic shavings.
- Do not solder brass adapters while inserted in the module main base. Damage to the plastic and rubber parts may occur due to the heat and may result in water damage.
- The materials used in the soldering process may attack certain types of plastics. Care should be taken during the installation process to assure that solder and flux do not come in contact with media tanks, the control module and related plastic components.



A prefilter should be used before a softener to prevent any foreign material from getting into the equipment.



VERY IMPORTANT! Where a brine drum overflow could cause damage, a 1/2" I.D. overflow line must be installed on the barbed fitting on drum and connected to a drain. Make sure the drain is not higher than barbed fitting.

NOTE:

Clear area along wall where PVC drain line will be run to floor drain. Kinetico does not recommend running flexible tubing across the floor or along walls, as it may be kicked out of discharge point at floor drain, or line may become pinched resulting in improper back washing.



When installing a plastic component in line, it is recommended that grounding straps be put in place **BEFORE** the lines are actually cut to ensure that the ground is never broken.



When installation is complete, plumbing lines must be chlorinated for sanitation. Common household bleach may be used. The amount of bleach will vary on plumbing size, lengths and fixtures.



On iron bearing water, a salt which contains resin cleaning additives is recommended. (**IMPORTANT!** This does not apply to tannin units.)

NOTE:

A clean grade of salt is strongly recommended. Do not use rock salt.



Read all steps, guides and rules carefully before installing and using the Kinetico Softener.

Kinetico Softener Installation CP 208 – CP 216

1. Determine location to install equipment. Make sure that the unit will be on a flat surface. Test the water to confirm unit is properly sized for installation. If sand/silt or turbidity is present, a separate prefilter should be installed.



A ladder should be used for all work over head that would be beyond your natural reach. If working continuously at a height of six feet or more, the appropriate safety devices must be employed.

2. FOR MODEL CP 213 & CP 216 MEDIA INSTALLATION:
(Note: the CP 208 and CP 210 units are already filled)
 - a) Remove module and remote base from media tanks.
 - b) Properly cover the distributor tubes to prevent media from getting inside.
 - c) For the Model CP 213, place 25 lbs. or 0.25 ft³ of gravel into each tank. For the Model CP 216, place 75 lbs. or .75 ft³ of gravel into each tank.
 - d) For the Model CP 213, place 2.5 ft³ (2 ½ bags) of high capacity resin into each tank. (This should leave 17" of freeboard.) For the Model CP 216, place 4.0 ft³ (4 bags) of high capacity resin into each tank.
 - e) Remove covering from distributor tubes, and replace the module and remote base onto tanks.
Note: the CP 216 has an adapter with distributor that must first thread onto the tank before the module is installed.



Verify installation complies with state and local plumbing codes before continuing.

3. Install with by-pass valving. Note the inlet and outlet arrows on valve head.
4. Connect the inlet/outlet adapters leading to the softener using the proper size plumbing. Plumb as necessary to accommodate the by-pass valve and to complete the installation.



A scorch pad must be used to protect any surface that may be exposed to a torch flame or excessive heat.



When installing a plastic component in line, it is recommended that grounding straps be put in place before the lines are actually cut to ensure that the ground is never broken.



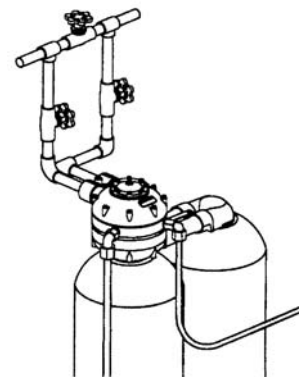
Do not solder brass adapters while inserted in the module main base. Damage to the plastic and rubber parts may result due to the heat. Also, the materials used in the soldering process may attack certain types of plastics. Care should be taken during the installation process to assure that solder and flux do not come in contact with media tanks, the control module and related plastic components.



Proper ventilation must be provided when using PVC cleaner or glue.



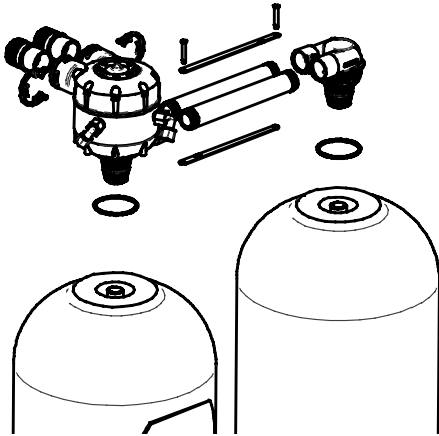
Loose clothing (ie.- shirt tails, sleeves, etc.) should not be worn or should be addressed before using a torch for soldering or a drill for drilling.



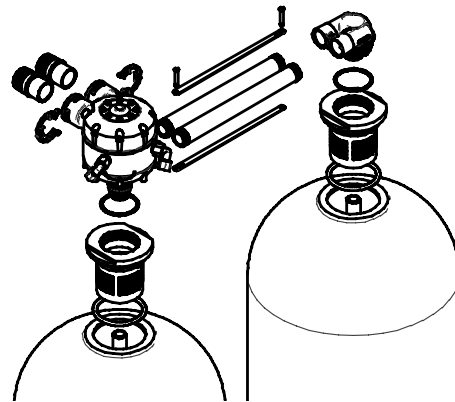
5. After all plumbing is completed, but before connecting equipment, flush both the inlet and outlet lines by opening the by-pass valve and allowing water to rinse out any debris in the lines.
6. Locate the enclosed kit containing: four o-rings, two pipes with o-rings, and a silicone packet. Apply a liberal amount of silicone to the four o-rings and the o-rings on the two pipes. Install the four o-rings on the inlet/outlet adapters.
7. Connect the main tank with softener valve to the inlet/outlet adapter. The inlet/outlet adapter is inserted into the Mach™ Control Valve and locked in place by the plastic e-clips.



It is important that the e-clips are fully inserted into the Mach™ Control Valve. Check that all 3 tabs on the e-clips are fully inserted. **Do not** reuse the old e-clips replace with new e-clips.



CP 208 - 213



CP 216

8. Connect the remote tank to the main tank using connector pipes, connector links and connector pins. (Always use both links.)



An air gap must be provided for all drain lines. Check local and state plumbing codes for the proper setup of drain line air gaps.

9. Run a drain line to the discharge point. **FOLLOW STATE AND LOCAL CODES.** Before connecting unit, check for any obstructions or kinks. Apply Teflon tape to pipe threads on side of softener valve, and install the two fittings supplied. Connect drain line to valve.



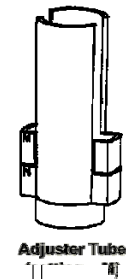
On drain lines for the CP 213 & 216 that must travel more than 8 feet up and 30 feet over, it is best to take the 5/8" drain line that fits the valve and attach it in a larger diameter line or pipe. The CP 208 & 210 will use 1/2" drain line. This will eliminate chances of restrictions.

10. Position the brine drum. In Kinetico Softeners, the brine drum mixes and stores a solution of salt or potassium chloride for regeneration of the softener media. During the brine rinse cycle, this solution is drawn from the brine drum and through the media to regenerate it.

The brine drum contains an adjustment to draw the correct amount of salt or potassium chloride solution for each cycle. This adjustment is made in two places: the adjuster tube and the float cup. The adjuster tube measures the amount of solution that is drawn from the brine drum into the softener during the brine rinse cycle. The float cup height determines how much softened water flows back into the brine drum to prepare for the next regeneration.

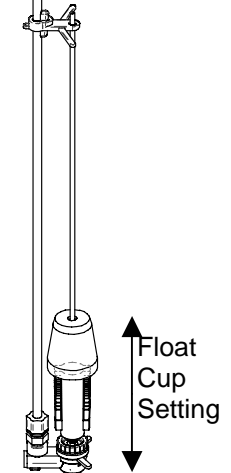
Adjuster Tube Setting

The adjuster tube is set by cutting and removing tabs on both sides of the tube. Using a pocket-knife, cut across each tab horizontally, following the channel in the plastic, and break off each tab individually until the proper setting is reached. The remaining number or letter imprinted on the tab determines the correct setting. The drawing at right shows an adjuster tube at setting "M".



Float Cup Setting

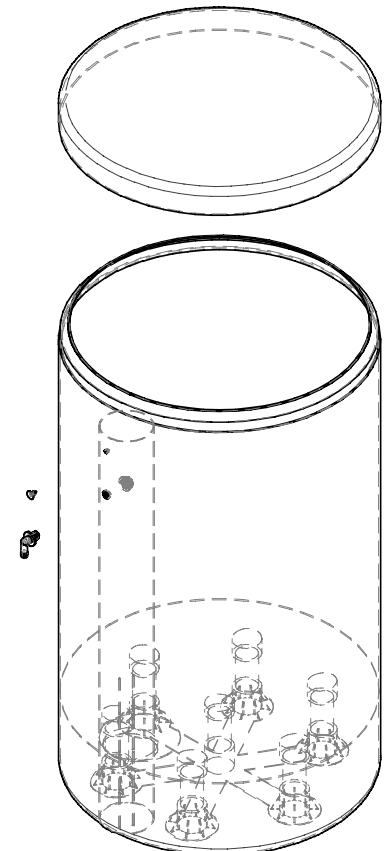
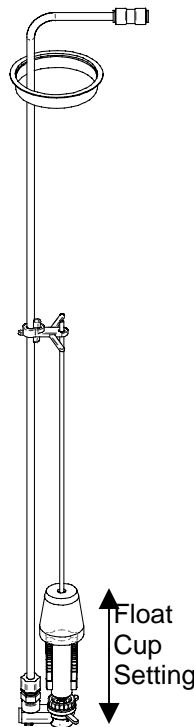
The float cup is set by adjusting its height above the bottom of the brine valve assembly. By removing the brine valve assembly and resting it on a flat surface, the height of the float cup can be measured with a ruler. The height is measured from the base of the brine valve assembly to the top of the float cup (see drawing at right). Note that standard settings are defined by markings on the rod of the brine valve assembly. The settings on the rod are listed in the tables at the end of this section. Where the predefined settings are not adequate, the actual float cup height, in inches, is listed, and the setting must be measured and set according to the measured float cup height.



The CP units require the Adjuster Tube and float cup to be set.

24 x 40 Brine Drum Valve Adjustment

Salt Setting	15 LBS	25 LBS	30 LBS	40 LBS
Adjuster Tube	1.25	K	N	N
Float Cup	10.5 in.	12 in.	11 in.	16 in.

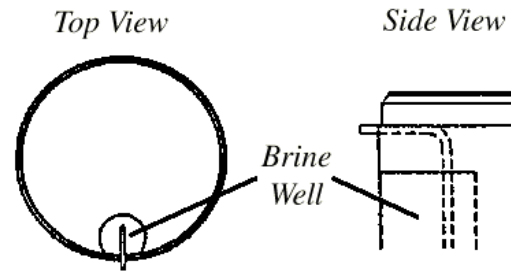


Installing the Brine Valve

After the adjustments have been made to the adjuster tube and the float cup, the brine valve assembly must be installed in the brine drum. Locate the brine valve in the brine well so that the bent tube is along the back of the brine well away from the brine drum wall. The bent tube snaps into a notch and extends from the brine drum about 1".



Do not drop the brine valve into the drum! Dropping may lower the float cup, resulting in an improper setting.



**Brine Valve
Installation**

11. Add a clean grade of softener salt at this time. **DO NOT USE ROCK SALT.**



On iron-bearing water, a salt that contains resin cleaning additives is recommended.

12. Open the inlet valve and the allow tanks to fill slowly with water. Water will run at the drain until unit is full and pressurized.
13. With the unit in service and under pressure, allow the brine drum to fill with water until the brine valve shuts off.
14. After the unit is fully pressurized, purge air from the lines by opening soft water outlet.



When installation is complete, plumbing lines must be chlorinated for sanitation. Common household bleach may be used. The amount of bleach will vary on plumbing size, length and fixtures.

15. **VERY IMPORTANT!** Where a brine drum overflow could cause damage, a 1/2" I.D. overflow line must be installed on the barbed overflow fitting on drum and connected to a drain. Make sure drain is not higher than barbed fitting. **FOLLOW STATE AND LOCAL CODES.**
16. Before leaving installation, check plumbing for leaks.

Central Brining System Installation



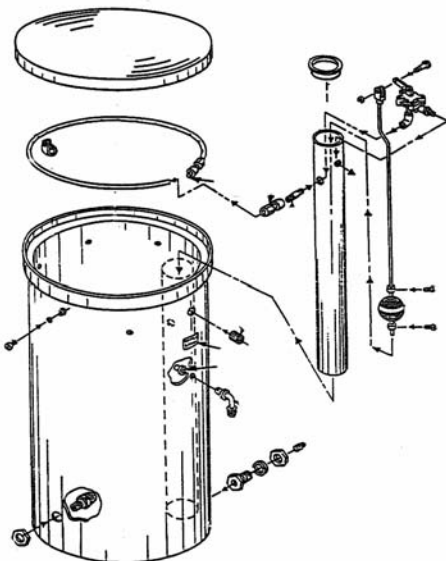
Use teflon tape for all threaded pipe connections

For 39" and 50" Diameter Drums

1. Assemble bulkhead fittings to brine drum as shown, with the rubber washer on the inside. Be sure the washer does not "squeeze" out while tightening.
2. Mount the brine well (Part #4758) to the drum using overflow fitting (Part #1138) and nut (Part #1139).
3. Assemble 90° elbow (Part # 3407) and nipple (Part #3406) to refill valve (Part #4967).
4. Install top collar (Part #2360) on bent float rod and position it 14 inches from straight end and secure. Slide ball on rod. Position lower collar (Part #2360) on rod, and secure it approximately 2 inches from end of rod.
5. Screw "float to valve" adapter fitting (Part #3408) to float rod - DO NOT OVERTIGHTEN.
6. Using pin (Part #3411) and "E" ring (Part #3413), attach rod and float assembly to valve (Part #4967) activator arm.
7. Lower float rod and valve assembly into brine well. Mount valve to tank through hole in brine well.
8. Assemble tube to nipple fitting (Part #4761) to nipple (Part #3406) through hole in brine wall.
9. Connect spray tube (Part #3431) to fitting (Part #4761) leading to valve and add end "plug" fitting to spray tube. Plug fitting consists of (Part #4761) hose to female thread fitting and ¼ inch pipe plug (Part #4762).
10. Using the 8 hangers (Part #3431), screws (Part #1869) and nuts (Part #3430) mount spray tube to drum using holes provided. Spray holes should be angled down towards salt.

For 24" Drum

The procedures are identical to those listed, except the shorter 46½ inch brine well is used. Also, only 6 hangers are needed to mount the spray tube (Part #4756).



Valve Modifications for Central Brining Operation

Depending on the CP unit selected, the Venturi Throat and Brine Flow Control may need to be changed. This will regulate the amount of salt used per regeneration.

Unit	Standard Throat	Standard Brining	Recommended Throat	Recommended Brining
CP 208	Tan (3342)	8.5 lbs.	Dark Blue (2117)	5.5 lbs.
CP 210	White (2120)	30 lbs.	Tan (3342)	10.5 lbs
CP 213	Yellow (6016)	42 lbs.	Clear (2379)	19 lbs.
CP 216	Yellow (6016)	42 lbs.	Black (1045)	35 lbs.

Troubleshooting

Ten steps to determine the problem...

1. Gather Information

Ask the customer questions. Any information obtained can reduce your time on the job. Many times the customer's response to questions will allow you to skip directly to the next section.

2. Test the Water

Test hot, cold and raw.

- ❑ *Hot water, stored in the water heater, can tell you what the water was like yesterday.*
- ❑ *Cold water, directly from the softener, tells you what the water is like right now.*
- ❑ *Raw water, before treatment, tells you if the water to be treated has changed and if the correct meter disc was installed originally.*

Test water at the brine fitting while water is running to determine if the softener is producing soft water.

Is there really a problem with the softener? Or does the problem lie elsewhere at the customer site?

3. Observe the installation

Look for customer related problems.

- ❑ *Is the bypass open or leaking?*
- ❑ *Is the softener out of salt?*
- ❑ *Is there bridged salt in the drum?*
- ❑ *Is the prefilter clogged?*

Look for obvious installation mistakes

- ❑ *Is the meter disc and salt setting correct according to raw water?*
- ❑ *Is the bypass disc correct?*
- ❑ *Are the inlet and outlet lines reversed?*
- ❑ *Drain installation – Are there any kinks, restrictions or T's from other appliances using water?*

Is the unit running water to drain?

Refer to the section for problems and solutions.

4. Run a soft water faucet wide open Watch the meter disc.

- Is it turning?*

Watch the no back pawl.

- As the meter disc turns clockwise, the no back pawl should drop into the next tooth, preventing the meter disc from turning backwards. Does it?*

Measure the metering rate.

- Wait for the no back pawl to drop into a tooth. Place a bucket under the faucet to catch the water. Let the meter disc turn for another tooth or two, then measure the water captured in the bucket. The approximate metering rate for all models is shown below.*

CP Softeners

Model Number	CP 208s	CP 208s OD	CP 210s	CP 210s OD	CP 213s OD	CP 216s OD
Gallons/Tooth	12.5	44	17.5	62	93	158

5. Place the unit in manual regeneration in the brine position

Check if unit is drawing brine by disconnecting the brine line from the elbow on the L-3.

- Is the brine suction elbow screen clogged?*
- Is the suction sound smooth and continuous with no water blow back?*
- Moisten a finger and place it on the open end of the elbow. Can you feel a smooth continuous suction?*

6. Remove the brine valve

Check the brine valve setting.

- Is it set according to the brine valve installation sheet?*

7. Look for leaks in the house

Make sure the customer is not using any water.

- Is the meter disc still turning?*

Some leaks may be so slow that the meter disc will not turn.

- Are there any leaky faucets?*
- Are there any toilets that run continuously?*

Place the unit in service position (6 o'clock or 12 o'clock).

Close the soft water side of the bypass and leave it closed for one minute. On a Kinetico bypass, turn it to the off position.

Open it.

- Did you hear a surge of water through the valve when it was opened? If so, there is a leak somewhere in the house.*

8. Measure water pressure

Low water pressure can cause hard water and/or salty water.

Measure the water pressure:

1. Adapt a pressure gauge to the brine fitting port on level 3.
 2. Turn on one cold water faucet wide open.
 3. Place either tank in the backwash portion of cycle.
- Did the pressure drop below 15 psi at the brine fitting for the CP208 and CP210 (25 psi for the CP 213 and CP 216)?*

The Kinetico valve requires a minimum of 15 psi for the CP 208 and CP 210 to function properly. The CP 213 and 216 require 25 psi to operate properly.

9. Measure backwash flow rate

Too little backwash flow can cause salty water.

Measure the amount of water coming out of the drain line during the backwash portion of cycle.

- Is it less than the backwash rate on the specification sheet?*

10. Check unit shut-off

The drain should be dry at the service positions (12 o'clock and 6 o'clock).

An occasional drip may occur. Measure the drip rate. There should be less than 5 ml of water collected in 22 seconds.

- *Is the drain running or dripping excessively in the service positions?*

Solving the Problem

Having run through the above 10 steps, you are now ready to solve whatever problems have been uncovered. The next section tells specifically how to resolve common complaints and problems with water treatment systems.

Hard Water

Problem	Reason	Solution
1. Water meter disc is not turning.	<ul style="list-style-type: none"> <input type="checkbox"/> Non-conforming meter drive pawl. <input type="checkbox"/> Meter drive spring installed wrong. <input type="checkbox"/> No back pawl not installed. <input type="checkbox"/> Damaged tooth on the meter disc. <input type="checkbox"/> Damaged gear in the gearing stack. 	<ul style="list-style-type: none"> ▪ Replace meter drive pawl. ▪ Reinstall meter drive spring. ▪ Install no back pawl. ▪ Replace meter disc. ▪ Regear Level 1 Assembly and check allowable flow rates.
2. The unit will not go into automatic regeneration.	<ul style="list-style-type: none"> <input type="checkbox"/> Water meter disc is not turning. <input type="checkbox"/> Control disc will not automatically advance out of service position. <input type="checkbox"/> Damaged teeth on control disc. 	<ul style="list-style-type: none"> ▪ See number 1 above. ▪ Replace regeneration start pawl. ▪ Replace control disc.
3. No vacuum in brine position.	<ul style="list-style-type: none"> <input type="checkbox"/> Check stems missing or not working correctly. <input type="checkbox"/> Plugged venturi. <input type="checkbox"/> Plugged backwash flow control. <input type="checkbox"/> Plugged brine elbow screen. 	<ul style="list-style-type: none"> ▪ Replace or add check stems. ▪ Clean out Level 3 venturi throat and molded venturi nozzle (Do <i>not</i> use a paper clip!). ▪ Clean out backwash flow control. ▪ Clean out brine elbow screen.
4. Short salting.	<ul style="list-style-type: none"> <input type="checkbox"/> The brine drum is not level. The grid system allows a water level no more than 1" above the grid. If the brine drum is not level, it may exceed this. 	<ul style="list-style-type: none"> ▪ Level the brine drum.
5. Bridged salt in the brine drum.	<ul style="list-style-type: none"> <input type="checkbox"/> Salt has solidified in the drum. 	<ul style="list-style-type: none"> ▪ Carefully move the salt around to break up the mass of solidified salt.
6. The bypass is open.	<ul style="list-style-type: none"> <input type="checkbox"/> An open bypass allows water to flow around the system without any treatment at all. 	<ul style="list-style-type: none"> ▪ Close the bypass.

7. The bypass is leaking.

- This can be determined by testing the water at a soft water tap. With the water still running, disconnect the brine line at the valve and test the water. Water that tests soft at the brine fitting and hard at the tap indicates a bypass that is leaking.
- Repair or replace the bypass.

8. Brine drum does not refill or overfills.

- The brine valve is set incorrectly.
 - Set the brine valve according to instructions on the brine valve installation sheet in the owner's pack or tech manual.
- The brine valve is non-conforming
 - Replace the brine valve.
- The brine drum is dirty.
 - Clean out the brine drum.
- The venturi nozzle is plugged.
 - Clean out Level 3 venturi throat and molded venturi nozzle (Do *not* use a paper clip!).
- The brine elbow screen is plugged.
 - Remove and clean brine elbow screen.

Frequent Regeneration

Problem	Reason	Solution
1. The customer does not understand Kinetico units.	<ul style="list-style-type: none"> □ If customers previously owned an electric unit with timer based regeneration, they may not realize that Kinetico units can regenerate at any time of the day or night. 	<ul style="list-style-type: none"> ▪ Explain to the customer how the Kinetico softener works. Emphasize that regeneration is controlled by the measurement of water use rather than on an arbitrary timed basis.
2. High water usage.	<ul style="list-style-type: none"> □ The customer may be using more water than he realizes. 	<ul style="list-style-type: none"> ▪ Obtain a water-bill (if customer is on a city water system) and determine how much water should be used. Average water consumption is 75 gallons per day per person.
3. The unit does regenerate too frequently.	<ul style="list-style-type: none"> □ Incorrectly labeled meter disc. Verify that the number of slots on the disc match the number molded on the disc. 	<ul style="list-style-type: none"> ▪ Install the correct meter disc.

High Salt Consumption

Problem	Reason	Solution
1. Regenerates too frequently.	<ul style="list-style-type: none"> □ See the section entitled Frequent Regeneration. 	<ul style="list-style-type: none"> ▪ See the section entitled Frequent Regeneration.
2. Water level in the brine drum is too high.	<ul style="list-style-type: none"> □ The brine valve is set wrong or non-conforming. □ The brine valve or the brine drum is dirty. □ The brine valve leaks. 	<ul style="list-style-type: none"> ▪ Verify the brine valve setting. Replace non-conforming brine valve. ▪ Clean brine valve and drum. ▪ Tighten the connectors on the brine valve.

Salty Treated Water

Problem	Reason	Solution
1. Restricted drain line.	<ul style="list-style-type: none"> □ The drain is kinked or clogged. 	<ul style="list-style-type: none"> ▪ Clear any obstructions. Make sure that the drain line flows smoothly and unrestricted.
2. Low water pressure.	<ul style="list-style-type: none"> □ The unit should not see water pressure drop below 15 psi on the outlet at any time. During the backwash portion of the regeneration cycle, it must hold at least 15 psi or the brine may not rinse out completely. □ The prefilter cartridge is plugged. 	<ul style="list-style-type: none"> ▪ Test the outlet pressure with the unit in backwash and one faucet at high flow. Measure the pressure by placing a gauge on the brine fitting. Raise pressure if below 15 psi. ▪ Replace prefilter cartridge.
3. The backwash flow control is plugged.	<ul style="list-style-type: none"> □ Without enough backwash flow to the drain, the unit cannot wash all the salt from the media tanks. 	<ul style="list-style-type: none"> ▪ Clean the backwash flow control.
4. The drain is extremely long or placed higher than 8 feet above the floor.	<ul style="list-style-type: none"> □ Such drain runs can put back-pressure on the unit and restrict the drain flow. This causes the same result as number 3 above. 	<ul style="list-style-type: none"> ▪ Locate a closer drain or use a larger diameter drain line.
5. The upper distributors are plugged. (This does not apply to High Efficiency softeners)	<ul style="list-style-type: none"> □ Foreign material that finds its way into the media tanks may be collected around the upper distributors during backwash, clogging them. 	<ul style="list-style-type: none"> ▪ Clean upper distributors. ▪ Install a prefilter.
6. Water level in the brine drum is too high.	<ul style="list-style-type: none"> □ The brine valve is set wrong or non-conforming. 	<ul style="list-style-type: none"> ▪ Verify the brine valve setting. Replace non-conforming brine valve.

Iron Bleed-through

Problem	Reason	Solution
1. Customer plumbing.	<ul style="list-style-type: none"> ❑ Previous iron buildup inside existing plumbing after the water softener. 	<ul style="list-style-type: none"> ▪ Verify that customer plumbing is the problem by testing the water quality at the brine fitting with water running.
2. The water meter disc is not set properly for current raw water conditions.	<ul style="list-style-type: none"> ❑ The composition of raw water can change with time. 	<ul style="list-style-type: none"> ▪ Check the hardness and iron content of raw water. Install the correct disc for current raw water conditions.
3. The salt setting is not set properly for current raw water conditions.	<ul style="list-style-type: none"> ❑ The composition of raw water can change with time. 	<ul style="list-style-type: none"> ▪ Check the hardness and iron content of raw water. Set the brine valve for current raw water conditions.
4. The iron may be ferric iron.	<ul style="list-style-type: none"> ❑ Ferric iron is not removable by ion exchange. ❑ The iron may be finer than the micron rating of the installed prefilter cartridge. 	<ul style="list-style-type: none"> ▪ Verify by using the demo softener to determine if iron is removable by ion exchange. Add additional equipment if needed. ▪ Install a cartridge with finer micron rating.
5. The customer's plumbing may include a galvanized pressure tank.	<ul style="list-style-type: none"> ❑ A galvanized pressure tank will create oxidized iron. 	<ul style="list-style-type: none"> ▪ Replace the galvanized pressure tank with a bladder style pressure tank.

Pressure loss

Problem	Reason	Solution
1. Reduced pressure entering the unit.	<ul style="list-style-type: none"> ❑ The prefilter is clogged. 	<ul style="list-style-type: none"> ▪ Replace the clogged prefilter.
2. The upper and/or lower distributors are plugged.	<ul style="list-style-type: none"> ❑ Foreign matter from the input lines is accumulating in the distributors. 	<ul style="list-style-type: none"> ▪ Clean the distributors. Add a prefilter to eliminate the foreign matter before it enters the unit. *

Water Running to Drain

Note: With softeners and filter/softeners, start by testing the drain water. If the drain water is hard, the tank currently in service has a problem with its drain valve. If the drain water is soft, start with number 1 below.

Problem	Reason	Solution
1. The balance piston O-ring is not seated properly.	<ul style="list-style-type: none"> □ Water will leak past an improperly seated balance piston O-ring and out the drain. 	<ul style="list-style-type: none"> ▪ Depress the actuator several times to seat the O-ring. Replace worn or non-conforming O-ring.
2. Bad control disc.	<ul style="list-style-type: none"> □ A scored control disc will allow a fast drip to a pencil sized stream to flow through the drain. 	<ul style="list-style-type: none"> ▪ Replace the control disc.
3. The drain or control valve seals are not seating properly.	<ul style="list-style-type: none"> □ Foreign matter under the seals will not allow them to seat properly. 	<ul style="list-style-type: none"> ▪ Disassemble and remove the foreign matter from seals.
4. Low water pressure.	<ul style="list-style-type: none"> □ If the water pressure is less than 15 psi (CP208-210) or 25 psi (CP213-216) at the brine fitting the system may not operate properly. □ Test Backwashing Filters with the unit in Backwash and 1 faucet (cold) running water. 	<ul style="list-style-type: none"> ▪ Increase water pressure.
5. The Main Valve piston quad rings or Level 4 internal quad rings are not sealing.	<ul style="list-style-type: none"> □ The quad rings may be rolled, pinched, torn or just dirty. □ The quad rings may be chloramine or chlorine damaged if on a chlorine treated water supply. 	<ul style="list-style-type: none"> ▪ Replace and re-silicone the quad rings. ▪ Replace quad rings with silicone seals. Order chloramine kit, part number 10534.

Taste, Color & Odor

Problem	Reason	Solution
1. Treated water has a metallic or iron taste.	<ul style="list-style-type: none"> □ See the section entitled "Iron Bleed-Through". 	
2. Treated water has chlorine odor and/or taste.	<ul style="list-style-type: none"> □ This is due to heavily chlorinated raw city water. 	<ul style="list-style-type: none"> ▪ Install a carbon filter.

3. Treated water has a salty taste.

- ❑ In high TDS (1000+) applications, salt taste may be present due to the ion exchange process or sodium chloride in the raw water.
- ❑ See the section entitled "Salty Treated Water."
- Inform the customer of the Kinetico Drinking Water System or Commercial RO System.

4. Treated water has a yellow tint.

- ❑ The raw water may have traces of tannins present.
- ❑ See the section entitled "Iron Bleed-Through."
- If tannins are present, use tannin softener.

5. Treated water has an odor (hot water only).

- ❑ The magnesium rod in hot water tanks can cause a reaction that gives off an odor of rotten eggs.
- Remove this rod from the hot water heater. An alternative rod may be installed.

Leaks

Problem	Reason	Solution
1. Water leaks from any of the assembly levels.	❑ Main Valve screws are not tightened.	▪ Depressurize the unit and tighten the Main Valve screws.
	❑ One of the seals between assembly levels (L-1 through L-4) is pinched or missing.	▪ Replace the non-conforming seal.
	❑ One of the screw holes is stripped or cracked.	
	❑ There is a crack on the seal area near a screw hole.	▪ Replace the base. ▪ Replace the level.
2. Water feed pressure is too high (125 psi maximum).	❑ No pressure regulator installed.	▪ Install pressure regulator.
	❑ The pressure regulator is broken.	▪ Replace pressure regulator.
3. Water leaks at the main base or remote base.	❑ The base is not tightened properly.	▪ Tighten base.
	❑ The O-ring on the base is pinched or missing.	▪ Replace base O-ring.

Equipment Noise

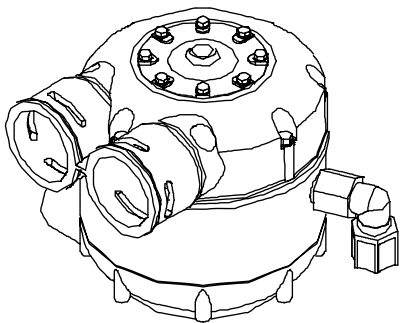
Problem	Reason	Solution
1. The unit makes a squealing noise.	<ul style="list-style-type: none"> ❑ The control disc is not flat on the ceramic, causing the drain valve to flutter. 	<ul style="list-style-type: none"> ▪ Replace the control disc, balance piston spring and the balance piston O-ring. You may also want to change the drain valves and seals.
2. The unit makes a gurgling, hissing or bubbling sound.	<ul style="list-style-type: none"> ❑ On new installations, there may be some air trapped in the unit initially. ❑ Air is being drawn into the plumbing. ❑ The brine line and/or the brine valve are not air checking. 	<ul style="list-style-type: none"> ▪ Run through an entire cycle to allow the air to escape. ▪ Identify air leaks in the plumbing and fix them. ▪ Identify and replace the faulty part(s).

Unit Sticks in Cycle

Problem	Reason	Solution
1. The unit sticks in regeneration or backwash cycle.	<ul style="list-style-type: none"> ❑ The regeneration flow path is plugged at the regeneration nozzle or flow control. ❑ The regeneration drive pawl and/or spring is weak or broken. ❑ There is a damaged tooth on the control disc. ❑ The eccentric pinion is worn. ❑ On backwashing filters, low pressure or poor backwashing may cause a plugged bed. 	<ul style="list-style-type: none"> ▪ Clean the regeneration flow path. ▪ Replace the regeneration drive pawl. ▪ Replace the control disc. ▪ Replace the eccentric pinion (snap fit). ▪ Increase inlet pressure or the frequency of backwash. Unit may need re-bedding.
2. The unit sticks in service cycle.	<ul style="list-style-type: none"> ❑ The regeneration start pawl is broken or missing. ❑ The control disc has a worn or missing tooth. 	<ul style="list-style-type: none"> ▪ Replace or install regeneration start pawl. ▪ Replace control disc.

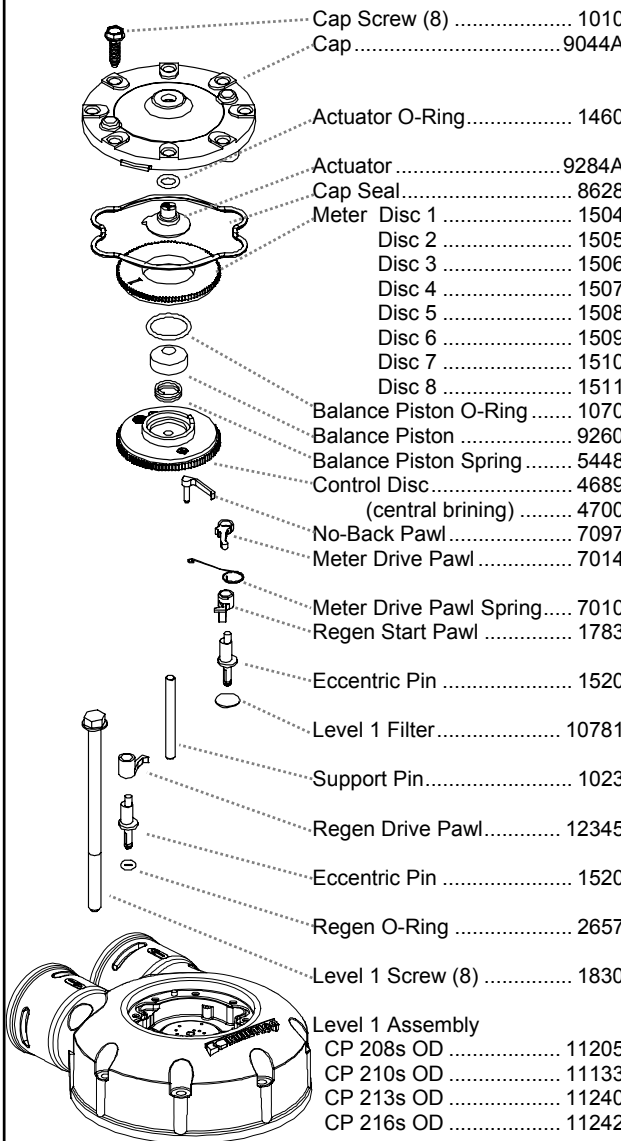
PARTS

Complete Valve



CP 208s OD	11203
CP 210s OD	11131
CP 213s OD	11156
CP 216s OD	11170
CP 208r OD	11368
CP 210r OD	11372
CP 213r OD	11163
CP 216r OD	11177

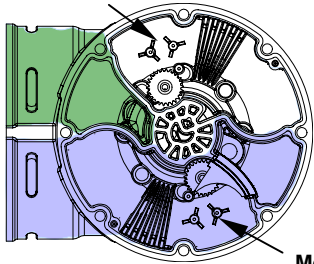
Level One



Cap Screw (8)	1010
Cap	9044A
Actuator O-Ring	1460
Actuator	9284A
Cap Seal	8628
Meter Disc 1	1504
Disc 2	1505
Disc 3	1506
Disc 4	1507
Disc 5	1508
Disc 6	1509
Disc 7	1510
Disc 8	1511
Balance Piston O-Ring	1070
Balance Piston	9260
Balance Piston Spring	5448
Control Disc	4689
(central brining)	4700
No-Back Pawl	7097
Meter Drive Pawl	7014
Meter Drive Pawl Spring	7010
Regen Start Pawl	1783
Eccentric Pin	1520
Level 1 Filter	10781
Support Pin	1023
Regen Drive Pawl	12345
Eccentric Pin	1520
Regen O-Ring	2657
Level 1 Screw (8)	1830
Level 1 Assembly	
CP 208s OD	11205
CP 210s OD	11133
CP 213s OD	11240
CP 216s OD	11242
CP 208r OD	11369
CP 210r OD	11373
CP 213r OD	11241
CP 216r OD	11243
Level 1 Seal (Red LSR)	8471
(not shown)	

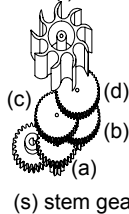
Gearing

Regeneration Gearing



Meter Gearing

turbine (t)



Unit (gallons)	short hand
CP 208s (3200)	s-1-5-4-P4-t
CC 210s (3850)	s-7-P23-P23-P6-t
CC 213s (8930)	s-p2-p20-p14-p14-p13-p12-t
CC 216s (15,200)	s-p2-p20-p14-p14-p13-p12-t
CC 208r (0)	none
CC 210r (0)	none
CC 213r (0)	none
CC 216r (0)	none

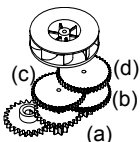
Part Number

Gear Stem.....	1521
Gear 1	1437
Gear 2	1523
Gear p2	7886
Gear 4	1525
Gear 5	1526
Gear P6.....	7889
Gear 7	1528
Gear P12.....	7892
Gear P13.....	7893
Gear P14.....	7894
Gear P20.....	7898

Turbine (PP9).....9258

Regeneration Gearing

turbine (t)



Unit (time)	Short hand
CP 208 (45 min.)	s-2-1-5-4-j8
CP 210 (90 min.)	s-2-3-4-4-j8
CP 213 (90 min.)	s-2-3-4-4-j8
CP 216 (90 min.)	s-2-3-4-4-j8

Part..... Number

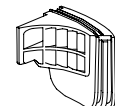
Gear Stem.....	1521
Gear 2	1523
Turbine (#8 jet).....	11011
Turbine (#10 jet).....	8781E

Stem Gear	1521
Washers	1773
E-Ring.....	1022
Meter Turbine Retainer.....	7859

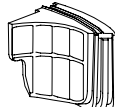
Nozzles



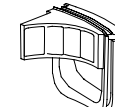
Micro Nozzle
0.05 gpm – 5 gpm 10880



1/2 Louver Nozzle
0.3 – 25 gpm 11018



Full Louver Nozzle
CP 208s OD
CP 210s OD
CP 213s OD
0.7 – 40 gpm 11019



Open Louver Nozzle
CP 216s OD
1.1 – 50 gpm 11188

Inlet / Outlet Adapters



1 1/2" - 1 1/4" Brass - Solder 11048
(included with CP systems)



3/4" Copper, Solder..... 10748



1" Brass, Solder 11049



1 1/4" PVC, Glue 11615



1 1/4" Noryl - MNPT 10739



1 1/4" Noryl - BSP.....



1" Noryl - MNPT



1" Brass, FNPT 10749



Adapter O-Ring..... 10733



Adapter E-Clip..... 11098

Level 2

- Vent Tube 1480
- Level 2 8784B
- Brine Flow Control
 - CC 208 (0.4 gpm) 1036
 - CP 210 (0.7 gpm) 1419
 - CP 213 (0.7 gpm) 1419
- Level 2 Seal (Red, LSR)..... 8630

Level 3

- Drain Elbow (1/2") 1850
- Drain Elbow (5/8) 7873
- Level 3 (208/210) 8914B
- Level 3 (213/216) 8916B
- Brine Elbow 1840
(3/8" NPT x 3/8" Tube)
- Level 3 Seal (Red, LSR) 8631
- Throat, CP 208 (tan) 3342
- Throat, CP 210 (white) 2120
- Throat, CP 213/216 (ylw) 6016
- Venturi Throat O-Ring 1460
- Regeneration Flow Control
(0.2 gpm) 9183A

Level 4

- 208/210 213/216
- Main Piston with Quad Ring
..... 2464 9751
- Main Piston Quad Ring
..... 1550 8186A
- Control Valve Quad Ring
..... 1590 8187A
- Control Valve (w / Quad)
..... 7868 8193A
- Level 4 5268 10542
- Control Valve Seal
..... 7869 8193A
- Backwash Flow Control
 - CP 208 (2.0 gpm) 1054
 - CP 210 (3.0 gpm) 1055
 - CP 213 (5.0 gpm) 1583
 - CP 216 (7.0 gpm) none
- Main Valve Seat (w/ seal)
..... 2465 9741
- Main Valve Seal
..... 7865 8185A
- Level 4 Seal (Red, LSR) 8632

Level 5

- 208/210 213/216
- Drain Valve Quad Ring ... 1590 8187A
- Drain Valve w Quad 7871 9749
- Interlock 1660 9261
- Level 5 (check stem) 7866A 7866A
- Drain Valve Seal 7869 8193A

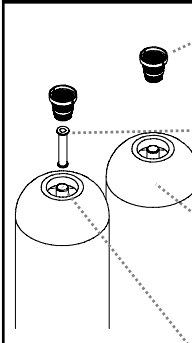
Level 6

- Main Base Seal 8620
- Check Stems 8627
- Main Base 8651B
- Main Base O-Ring 8925
- Upper Distributor
 - 208/210/213 9251
 - 216 11155

Remote Base

- Remote Base 1343A
- Main Base O-Ring 8925
- Upper Distributor
 - 208/210/213 9251
 - 216 11155

Media Tanks, Distributors and Riser Tubes



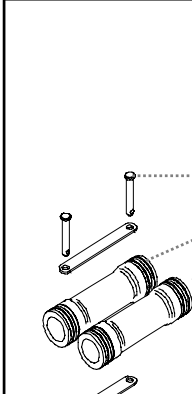
Upper Distributor
 208/210/213 9251
 216 11155

Flow Restrictor (main tank)
 208/210 5567A
 213/2116 none

Media Tank
 208 1091a
 210 9823
 213 8086
 216 11174

Distributor Tube
 208 1087B
 210 10526B
 213 8322A
 216 11166

Tank Connectors



Connector Kit
 208 11014
 210 11029
 213 11042
 216 11167

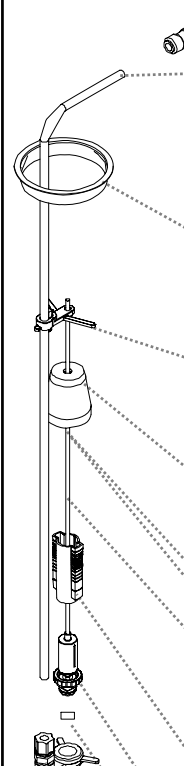
Connector Pin 4742

Connector O-Ring 1328

Connector Pipe
 208 (8") 11097
 210 (10") 11030
 213 (13") 8081
 216 (16") 9213

Connector Link
 208 (8") 2845
 210 (10") 2846
 213 (13") 8079
 216 (16") 9212

Brine Valve



$\frac{3}{8}$ " x $\frac{3}{8}$ " Tube Union 9210

Bent Tube (18x35 Brine Tank) 7802

Well Cover (18x35 Brine Tank) 7815A

Rod Lock (18x35 Brine Tank) 7796

Float Cup (18x35 Brine Tank) 7821

Float Cup Grommet 7789
 Float Cup Retainer 7820A

Rod Guide (18x35 Brine Tank) 7798

Adjuster Tube (18x35 Brine Tank) 7787B

Brine Valve Assembly 7786

Brine Valve Quad Ring 9804

Brine Valve Body with connector 7783

Connector, $\frac{3}{8}$ " Tube x $\frac{1}{4}$ " MNPT 7781

Complete Brine Valve Assemblies
 18 x 35 Brine Tank 7805
 24 x 40 Brine Tank 10591

Media

Softening Resin (1 ft³ bag) 68073
 Gravel (1 ft³ bag) 1226A

COMMERCIAL PLUS

manual part number: 11160a
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