



Owners Manual

Commercial Plus Softener Series



Models:

CP 213s OD
CP 216s OD

TABLE OF CONTENTS

1.0 General Information

About this Manual.....	4
The Kinetico Commercial Plus (CP) Product Line.....	4
System Specifications	5
Disc Selection	6

2.0 Operating Specifications

Kinetico Valve Components	8
Level 1.....	8
Flow Nozzle.....	8
Meter Gearing.....	9
Regeneration Pawls	9
Jet Regeneration	9
Control Disc.....	9
Control Disc Indicator	12
Levels 2 through 6.....	12
Additional System Components	13
Brine Tanks.....	14

3.0 Installation

Getting Started	15
Pre-installation Review	15
Kinetico Softener Installation CP213 – CP216.....	16
CP213s OD Data Sheet.....	19
CP216s OD Data Sheet.....	20
DA 213 OD Data Sheet.....	21
NR 213 OD Data Sheet	22
Brine Drum Settings	23
Central Brining System Installation	25

4.0 Troubleshooting

Ten Steps to Determine the Problem	27
Hard Water	30
Frequent Regeneration / Backwashing	31
High Salt Consumption.....	32
Salty Treated Water.....	32
Iron Bleed-through.....	33
Pressure loss	33
Water Running to Drain	34
Taste, Color & Odor.....	35
Leaks	36
Equipment Noise	37
Unit Sticks in Cycle.....	37

5.0 Parts

Complete Valve / Level 1.....	38
Gears	39
Nozzles	39
Inlet / Outlet Adapters.....	39
Level 2-6.....	40
Media Tanks, Brine Tanks, Brine Valves and Media	41

GENERAL INFORMATION

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 allows for all softener functions to operate automatically and non-electrically. The system has a number of options as described:

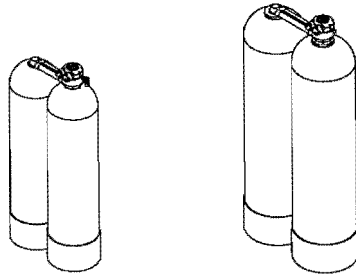
(OD) – Overdrive

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

(s) – Standard or Alternating Service

This is where one tank is in service and the other tank is regenerating or in stand-by. The (s) standard feature allows for higher hardness levels to be removed, but offers lower service flow rates.

SYSTEM SPECIFICATIONS



Product Name	CP 213s OD	CP 216s OD
Overdrive Flow (15/30 psig)	28 – 40 gpm	35.0 – 47.0 gpm
Alternating Flow (15/30 psig)	20.0 - 30.0 gpm	23.0 - 33.0 gpm
Tank Size	13" x 54"	16" x 65"
Resin Volume per Tank	2.5 ft ³	4.0 ft ³
Under Bedding	24 lbs. Gravel	75 lbs. Gravel
Upper Distributor	0.012" Slotted Hub	0.012" Slotted Hub
Lower Distributor	0.012" Slotted Hub	0.012" Slotted Hub
Service Flow Direction	Downflow	Downflow
Regeneration Flow Direction	Upflow	Upflow
Maximum Tank Capacity	70,000 grains	112,000 grains
Meter Gearing	8,922 gallons	15,192 gallons
Flow Nozzle	Full Louver	Open Louver
Minimum Flow Rate	0.75 gpm	1.1 gpm
Regeneration Volume	142 gallons	160 gallons

CP 213 – 13" x 54" Tanks

Part Number	Model	Description
11750	CP 213s OD	Commercial Plus Softener, 13" x 54" Tanks, Overdrive, 24 x 40" Brine Tank
11153	CP 213s OD	Commercial Plus Softener, 13" x 54" Tanks, Overdrive, No Brine Tank, Media Separate
11184	CP 213s OD	Commercial Plus Softener, 13" x 54" Tanks, Overdrive, No Brine Tank, No Media

CP 216 – 16" x 65" Tanks

Part Number	Model	Description
11182	CP 216s OD	Commercial Plus Softener, 16" x 65" Tanks, Overdrive, 24 x 40" Brine Tank, Media Separate
11168	CP 216s OD	Commercial Plus Softener, 16" x 65" Tanks, Overdrive, No Brine Tank, Media Separate
11186	CP 216s OD	Commercial Plus Softener, 16" x 65" Tanks, Overdrive, 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

DISC SELECTION

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.

			CP213s OD																																		
			Water Hardness																																		
gpg	mg/l	°dH																																			
50	855	29.5																																			
49	838	28.9	8																																		
48	821	28.3	8	8																																	
47	804	27.7	8	8																																	
46	787	27.1	8	8	8																																
45	770	26.5	8	8	8																																
44	752	25.9	8	8	8	8																															
43	735	25.3	7	8	8	8	8																														
42	718	24.8	7	7	8	8	8																														
41	701	24.2	7	7	7	8	8	8																													
40	684	23.6	7	7	7	7	8	8																													
39	667	23	7	7	7	7	8	8																													
38	650	22.4	6	7	7	7	7	8																													
37	633	21.8	6	6	7	7	7	7																													
36	616	21.2	6	6	6	7	7	7	7																												
35	599	20.6	6	6	6	6	7	7	7																												
34	581	20	6	6	6	6	6	7	7																												
33	564	19.5	6	6	6	6	6	6	7																												
32	547	18.9	5	6	6	6	6	6	6																												
31	530	18.3	5	5	5	6	6	6	6	6																											
30	513	17.7	5	5	5	5	6	6	6	6	6																										
29	496	17.1	5	5	5	5	5	6	6	6	6																										
28	479	16.5	5	5	5	5	5	5	5	6	6																										
27	462	15.9	5	5	5	5	5	5	5	5	6																										
26	445	15.3	4	4	5	5	5	5	5	5	5	5																									
25	428	14.8	4	4	4	4	5	5	5	5	5	5	5																								
24	410	14.2	4	4	4	4	4	4	5	5	5	5	5																								
23	393	13.6	4	4	4	4	4	4	4	4	5	5	5	5																							
22	376	13	4	4	4	4	4	4	4	4	4	4	4	5																							
21	359	12.4	4	4	4	4	4	4	4	4	4	4	4	4																							
20	342	11.8	3	3	4	4	4	4	4	4	4	4	4	4	4																						
19	325	11.2	3	3	3	3	3	4	4	4	4	4	4	4	4																						
18	308	10.6	3	3	3	3	3	3	3	3	3	4	4	4	4																						
17	291	10	3	3	3	3	3	3	3	3	3	3	3	3	4																						
16	274	9.5	3	3	3	3	3	3	3	3	3	3	3	3	3																						
15	257	8.9	3	3	3	3	3	3	3	3	3	3	3	3	3																						
14	239	8.3	3	3	3	3	3	3	3	3	3	3	3	3	3																						
13	222	7.7	2	2	2	2	2	2	2	3	3	3	3	3	3																						
12	205	7.1	2	2	2	2	2	2	2	2	2	2	2	2	2																						
11	188	6.5	2	2	2	2	2	2	2	2	2	2	2	2	2																						
10	171	5.9	2	2	2	2	2	2	2	2	2	2	2	2	2																						
9	154	5.3	2	2	2	2	2	2	2	2	2	2	2	2	2																						
8	137	4.8	2	2	2	2	2	2	2	2	2	2	2	2	2																						
7	120	4.2	1	1	1	1	1	1	1	2	2	2	2	2	2																						
6	103	3.6	1	1	1	1	1	1	1	1	1	1	1	1	1																						
5	86	3	1	1	1	1	1	1	1	1	1	1	1	1	1																						
4	68	2.4	1	1	1	1	1	1	1	1	1	1	1	1	1																						
3	51	1.8	1	1	1	1	1	1	1	1	1	1	1	1	1																						
2	34	1.2	1	1	1	1	1	1	1	1	1	1	1	1	1																						
1	17	0.6	1	1	1	1	1	1	1	1	1	1	1	1	1																						
			gpm	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			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	

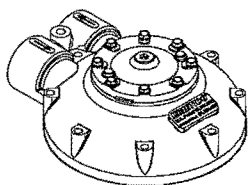
NOTE: Number (1 through 8) within the graph represent meter disc setting.

			CP216s OD																																		
gpg	mg/l	°dH																																			
Requires Alternating Operation	50	855	29.5																																		
	49	838	28.9																																		
	48	821	28.3	8																																	
	47	804	27.7	8	8																																
	46	787	27.1	8	8	8																															
	45	770	26.5	8	8	8	8																														
	44	752	25.9	8	8	8	8	8																													
	43	735	25.3	8	8	8	8	8	8																												
	42	718	24.8	7	7	8	8	8	8	8																											
	41	701	24.2	7	7	7	8	8	8	8																											
	40	684	23.6	7	7	7	7	8	8	8	8																										
	39	667	23	7	7	7	7	7	8	8	8	8																									
	38	650	22.4	7	7	7	7	7	7	8	8	8	8																								
	37	633	21.8	6	7	7	7	7	7	7	8	8	8																								
	36	616	21.2	6	6	7	7	7	7	7	7	8																									
	35	599	20.6	6	6	6	6	7	7	7	7	7	7																								
	34	581	20	6	6	6	6	6	6	7	7	7	7	7																							
33	564	19.5	6	6	6	6	6	6	6	7	7	7	7	7																							
32	547	18.9	6	6	6	6	6	6	6	6	6	7	7	7	7																						
31	530	18.3	5	6	6	6	6	6	6	6	6	6	6	7	7																						
Water Hardness	30	513	17.7	5	5	5	5	6	6	6	6	6	6	6	6	6																					
	29	496	17.1	5	5	5	5	5	6	6	6	6	6	6	6	6	6																				
	28	479	16.5	5	5	5	5	5	5	6	6	6	6	6	6	6	6																				
	27	462	15.9	5	5	5	5	5	5	5	5	5	5	6	6	6	6																				
	26	445	15.3	5	5	5	5	5	5	5	5	5	5	5	5	6	6																				
	25	428	14.8	4	4	5	5	5	5	5	5	5	5	5	5	5	5																				
	24	410	14.2	4	4	4	4	4	4	5	5	5	5	5	5	5	5																				
	23	393	13.6	4	4	4	4	4	4	4	4	4	4	4	4	4	4																				
	22	376	13	4	4	4	4	4	4	4	4	4	4	4	4	4	4																				
	21	359	12.4	4	4	4	4	4	4	4	4	4	4	4	4	4	4																				
	20	342	11.8	4	4	4	4	4	4	4	4	4	4	4	4	4	4																				
	19	325	11.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
	18	308	10.6	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
	17	291	10	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
	16	274	9.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
	15	257	8.9	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
	14	239	8.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3																				
13	222	7.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
12	205	7.1	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
11	188	6.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
10	171	5.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
9	154	5.3	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
8	137	4.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
7	120	4.2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																					
6	103	3.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
5	86	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
4	68	2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
3	51	1.8	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
2	34	1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
1	17	0.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1																					
			gpm	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			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

NOTE: Number (1 through 8) within the graph represent meter disc setting.

OPERATING SPECIFICATIONS

Kinetico Valve Components

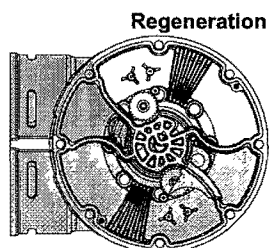


Kinetico 1000 Valve

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 Kinetico 1000 and Kinetico 1250 valves. Kinetico 1250 valves are used with the CP Series.

Level 1 Operation

Level 1 assembly consists of three chambers: inlet, outlet and regeneration chambers.



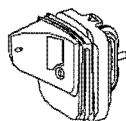
Outlet

Kinetico 1250 Valve

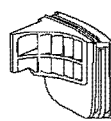
Hard water enters the inlet chamber and travels to the media tank where it is treated. Treated water moves from the media tank to the outlet chamber. Contained in the outlet chamber is a water meter turbine, which turns only when water is used. Gears connect the water meter turbine to the water meter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

Flow Nozzle

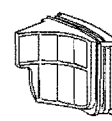
Accuracy and range of the flow meter will depend on the nozzle used with the system. Most units incorporate the half louver nozzle. This nozzle has a highly accurate and wide range of flow metering capability. If an alternative nozzle is used, a different meter volume per 360° on the water meter will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



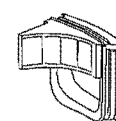
Micro



Half Louver



Full Louver

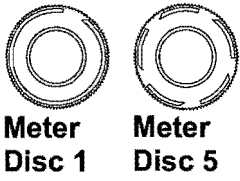


Open Louver

Part Number	10880B	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

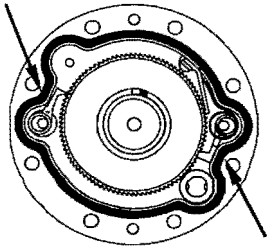
Meter Gearing



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

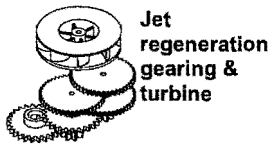


Regeneration start pawl

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



Jet regeneration gearing & turbine

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.

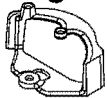


Normal regeneration gearing & turbine

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.

Gear Alignment Clip



The Gear Alignment Clip is used to keep optimal spacing between gears. This minimizes pressure loss and maximizes flow sensitivity.

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



Gray



Black



Orange



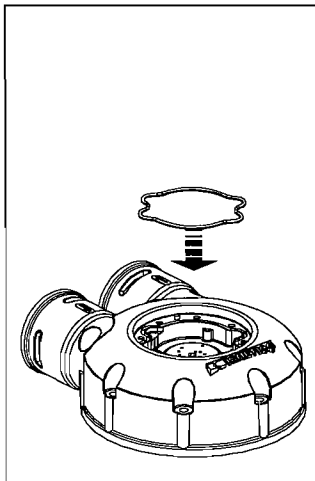
Tan



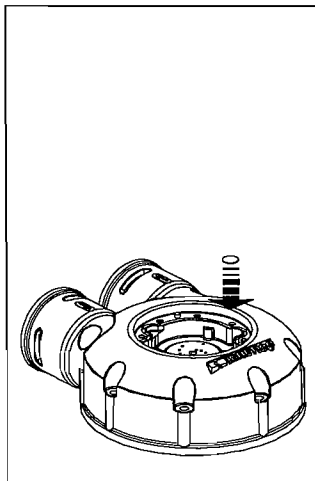
Purple

	White 4689*	Gray 7931	Black 4700A	Orange 8637	Tan 5565	Purple 8635
PN	4689*	7931	4700A	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 %

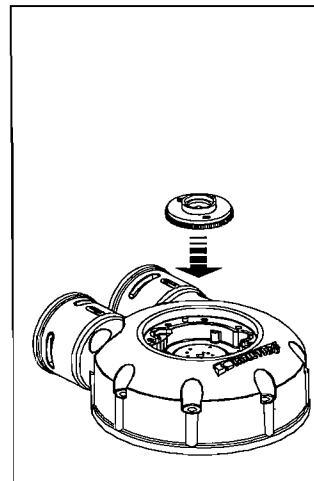
Control Disc, Screen and Seal



Place Cap Seal in groove.



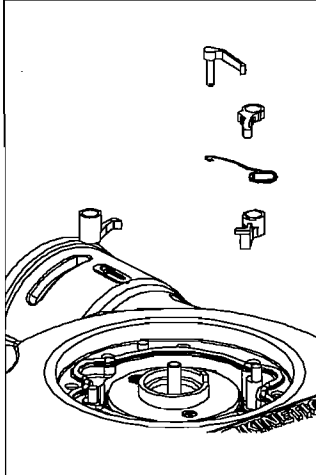
Insert Level One Screen into the hole at 5 o'clock position



Set the Control Disc onto the ceramic disc, flat side down. The Support Pin goes through the hole in the center of the Control Disc.

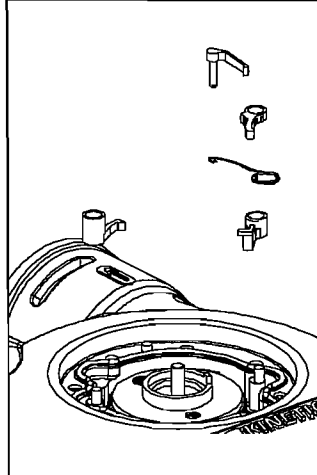
Pawls

Step 1



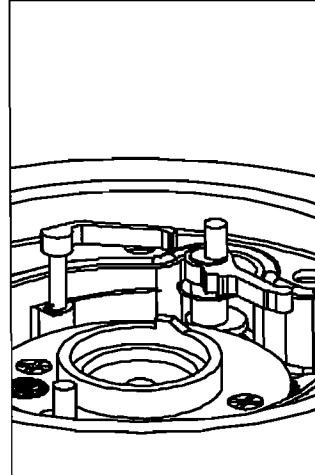
Place the Regeneration Drive Pawl onto the Eccentric Pin in the 10 o'clock position with the spring wire against the wall.

Step 2



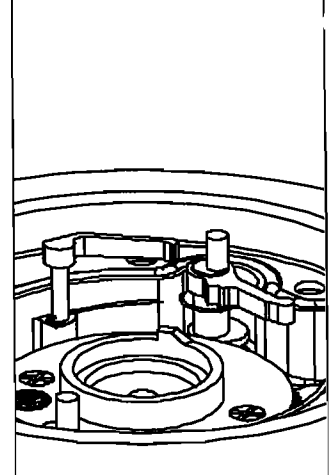
Place the Regeneration Start Pawl onto the Eccentric Pin in the 4 o'clock position with the spring wire against the wall.

Step 3



Drop the No-back Pawl leg into the small loop at one end of the Meter Drive Pawl Spring making sure that the vertical arm of the Meter Drive Spring is sticking up. Place the No-back Pawl leg into the small hole at the 2 o'clock position. Drop the large loop of the Meter Drive Spring over the eccentric pin at the 4 o'clock position.

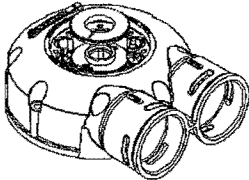
Step 4



Place the Meter Drive Pawl on top of the Regeneration Start Pawl, making sure that the Meter Drive Spring vertical arm is placed in the notch on the Meter Drive Pawl as shown in the detail above.

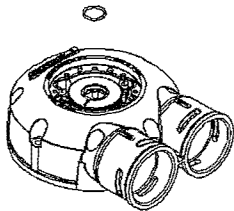
Meter Disc and Balance Piston

Step 1



Force the Meter Drive Pawl against the side of Level 1. While holding the Meter Drive Pawl against Level 1 side, place the Meter Disc on top of the Control Disc with number facing up. Make sure the meter disc lies flat against the control disc.

Step 2



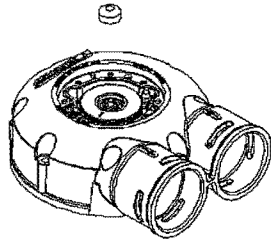
Place the Balance Piston O-ring in the groove on the Control Disc.

Step 3



Set the Balance Piston Spring in the center of the cup on the Control Disc.

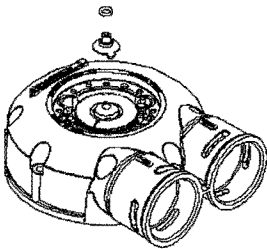
Step 4



Place the Balance Piston on top of the Balance Piston Spring.

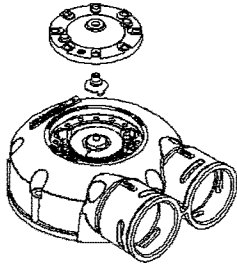
Cap

Step 1



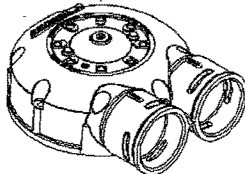
Slide the Actuator O-ring down onto the Actuator.

Step 2



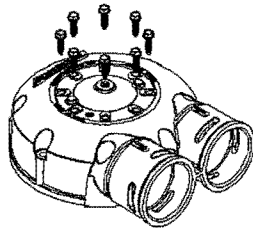
Place the Actuator into the hole in the D.O. cap. There is enough friction that the Actuator will stay in the D.O. cap.

Step 3



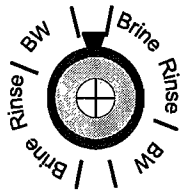
Place the D.O. cap on top of the Level One Assembly, making sure that the leg on the Cap goes over the Level One Screen at the 5 o'clock position.

Step 4



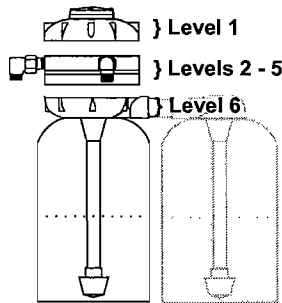
Secure the D.O. cap with 8 cap screws.

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.

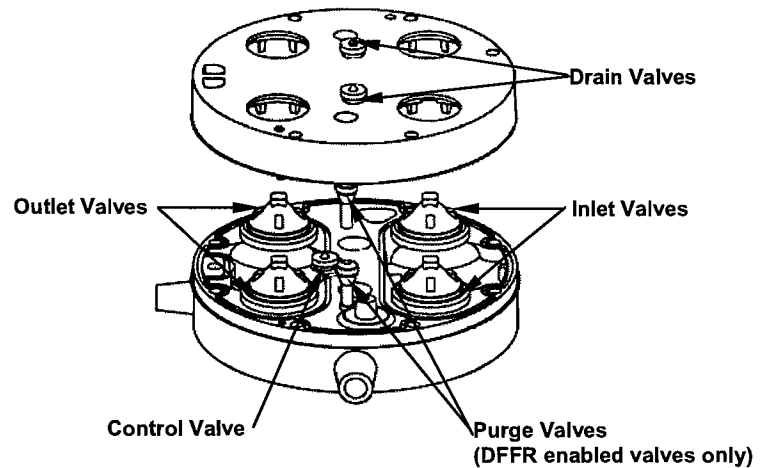
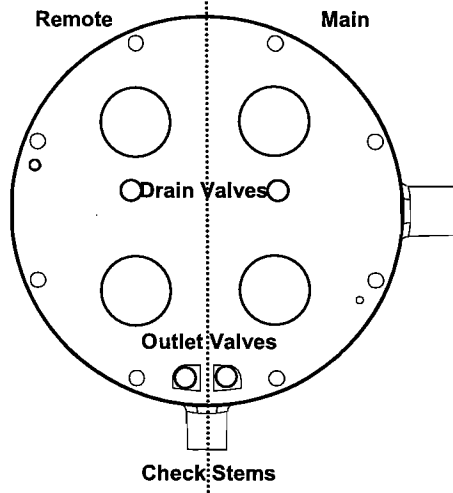
Levels 2 through 6



The lower valving section consists of Level 2, Level 3, Level 4 and Level 5 assemblies.

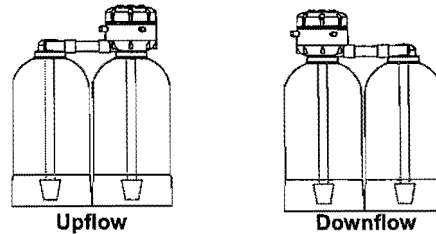
In the center, there is the regeneration control valve. This valve opens after 4 teeth on the control disc have engaged. This valve then opens, and powers the regeneration cycle.

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. 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.



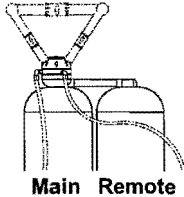
Level 6

The final level of the valve is used to direct the normal service path of the water. This can be either downflow or upflow. Since all regenerations are countercurrent, choosing the service direction also specifies the regeneration direction. Downflow service is used with standard, non-packed tank systems. For high efficiency, packed tank systems, upflow service is specified.



ADDITIONAL SYSTEM COMPONENTS

System By-pass

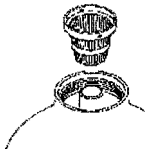


For each system, a by-pass is recommended. This can be installed using three ball valves. This allows the system to be isolated during any service operations. By-pass valving is not included as a part of the system package.

Resin Tanks

Each system uses two resin tanks. The main tank includes the Kinetico 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. The CP 216s OD riser tube increases to 1.5 inches.

Distributors

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

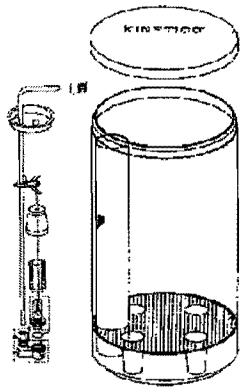
Media

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 TANKS



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 of brine to be produced for each cycle.

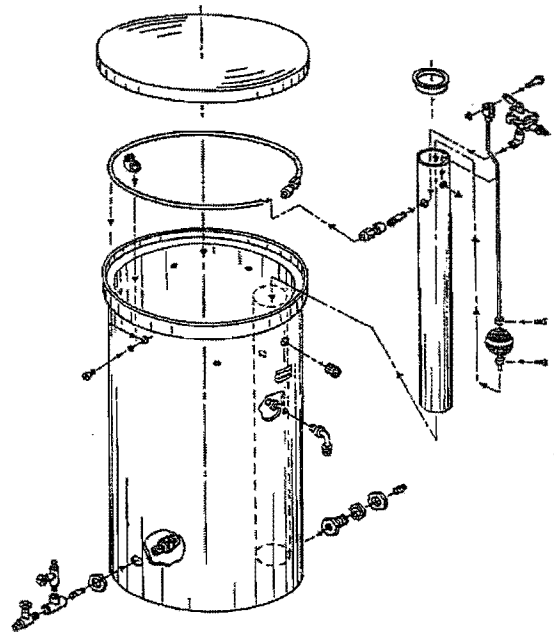
Central Brine System

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.

- 4724A C/B Brine Drum, 24" x 48", Drilled
- 4726A C/B Brine Drum, 39" x 60", Drilled
- 4728A C/B Brine Drum, 50" x 60", Drilled
- 4781 C/B Brine System Internals
- 7952 C/B Brine Check Valve Kit



Valve Modifications for Central Brining Operation

Depending on the CP unit selected, the Venturi Throat 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 213	Yellow (6017)	42 lbs.	Clear (2379)	19 lbs.
CP 216	Yellow (6017)	42 lbs.	Black (1045)	35 lbs.

INSTALLATION

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: shirttails, 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, E-clips 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 backwashing.



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 213 – 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:

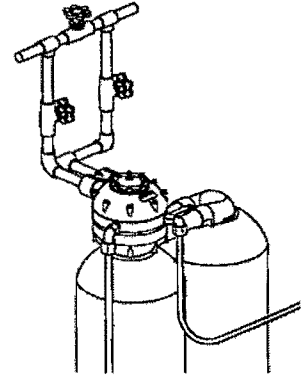
- a) Remove module and remote bases from media tanks.
- b) Properly cover the distributor tubes to prevent media from getting inside.
- c) For the Model CP 213, place 25 lbs. or 0.25 ft³ of gravel into each tank. For the Model CP 216, place 75 lbs. or .75 ft³ of gravel into each tank.
- d) For the Model CP 213, place 2.5 ft³ (2 ½ bags) of high capacity resin into each tank. (This should leave 14" of freeboard.) For the Model CP 216, place 4.0 ft³ (4 bags) of high capacity resin into each tank leaving 18" of freeboard. Freeboard depths are estimates, and will change with settling and the form of the resin.

- e) Remove covering from distributor tubes, and replace the module and remote bases 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.

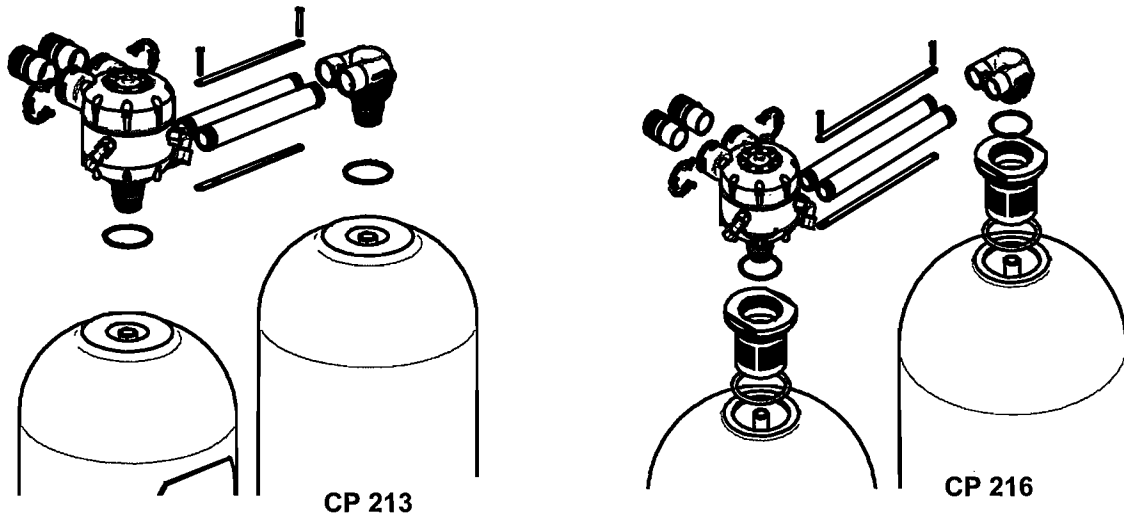


Loose clothing (ie.- shirttails, sleeves, etc.) should not be worn or should be addressed before using a torch for soldering or a drill for drilling.

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 Kinetico® Control Valve and locked in place by the plastic E-clips.



It is important that the E-clips are fully inserted into the Kinetico 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.



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. This will eliminate chances of restrictions. Running drain line higher than 10 feet will inhibit the ability of the venturi to draw brine.

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.

See the Brine Valve Settings section of this manual for specific brine valve settings.

CP 213s OD Data Sheet

System Components

Media Vessel (qty) Size	(2) 13" x 54"
Media Vessel Construction	Wrapped Polyethylene
Empty Bed Volume	3.68 ft ³
Media	2.50 ft ³ Non Solvent Cation Resin
Bed Depth / Freeboard.....	40" / 14"
Riser Tube.....	1" ABS
Distributor Upper.....	0.014" Slots, ABS Basket
Lower.....	0.014" Slots, ABS Basket
Underbedding.....	0.24 ft ³ (24 lbs), ¼ x ½ Gravel
Regeneration Control.....	Non-electric Use Meter
Regeneration Type.....	Countercurrent
Meter Type.....	0.75 - 40.00 gpm Polypropylene Turbine (Kineticco Full Louver Flow Nozzle)

Inlet Water Quality

Pressure Range	25 - 125 psi Dynamic Pressure
Temperature Range.....	35 - 120° F
pH Range	5 - 10 SU
Free Chlorine Cl ₂ (Max.)	2.0 mg/L
Hardness as CaCO ₃ (Max.)	51 gpg

Operating Specs

Flow Range - Overdrive (15 / 30 psig)	28.0- 40.0 gpm
Flow Range - Alternating (15 / 30 psig).....	20.0 - 30.0 gpm
Dimensions (width x depth x height).....	27" x 13" x 60"
Weight (Operating / Shipping).....	450 / 300 lbs.

Connections

Inlet / Outlet Connections.....	Custom Adapter and E-clip (1 ½" Brass Sweat Fittings Included)
Drain Connection	0.625" Tube
Brine Line Connection.....	0.375" Tube
Power	None

System Part Numbers

CP 213s OD, 24" X 40" brine tank	11750
CP 213s OD, no brine tank, media separate	11153
CP 213s OD, empty, no brine tank	11184

Brine Tank Options

Tank Description	24" x 40"
Brine Tank Part Number	10586
Material	HDPE
Salt Capacity.....	500 lbs.

Regeneration Specifications

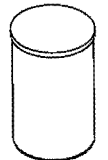
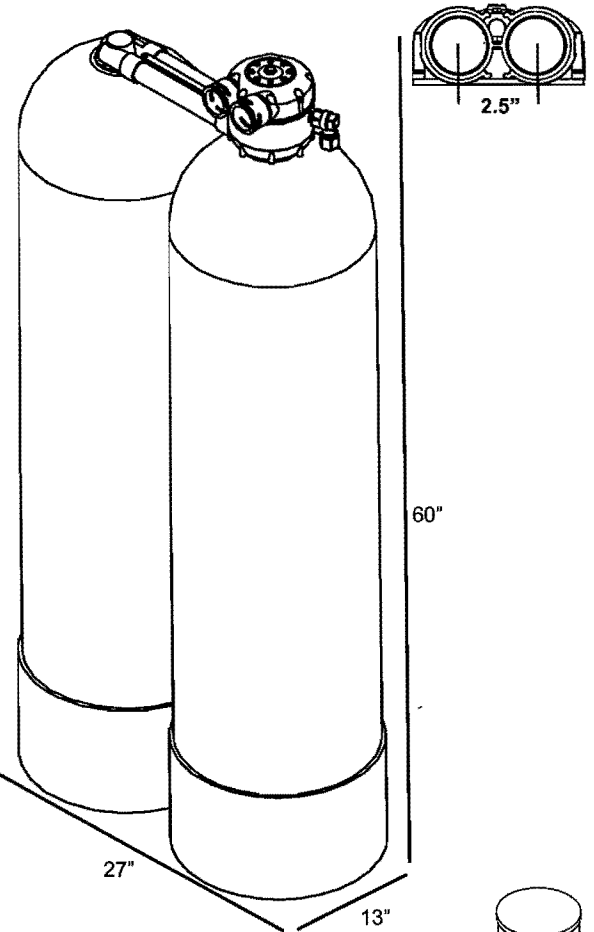
Regeneration Volume / Time	142 gallons / 90 minutes
Backwash Flow Control.....	5.00 gpm
Brine Refill Flow Control.....	0.70 gpm

Overdrive Operation

Setting	Capacity	Efficiency	Dosing	Meter Disc	Disc Selection (Compensated Hardness*)							
					1	2	3	4	5	6	7	8
15 lbs.	60,000 grains	4,000 gr./lb.	6.0 lbs./ft ³		5	10	14	17	21	25	30	35
25 lbs.	70,000 grains	2,800 gr./lb.	10.0 lbs./ft ³		6	12	16	20	24	30	35	40
			Peak flow during regeneration:		28.0	28.0	28.0	20.7	15.7	12.4	10.0	8.3

Alternating Operation

Setting	Capacity	Efficiency	Dosing	Meter Disc	Disc Selection (Compensated Hardness*)							
					1	2	3	4	5	6	7	8
15 lbs.	60,000 grains	4,000 gr./lb.	6.0 lbs./ft ³		6	12	18	24	30	35	40	45
25 lbs.	70,000 grains	2,800 gr./lb.	10.0 lbs./ft ³		7	14	21	28	34	40	45	51
			Flow during regeneration (@ 15 psig):		20	20	20	20	15.7	12.4	10.0	8.3
			Gallons/Regeneration:		8,922	4,461	2,974	2,231	1,784	1,487	1,275	1,115



*Compensated hardness in gpg = Hardness + (3 x Fe in mg/L)

CP 216s OD Data Sheet

System Components

Media Vessel (qty) Size (2) 16" x 65"
 Media Vessel Construction Wrapped Polyethylene
 Empty Bed Volume 6.55 ft³
 Media 4.0 ft³ Non Solvent Cation Resin
 Bed Depth / Freeboard 47" / 18"
 Riser Tube 1" ABS
 Distributor Upper 0.014" Slots, ABS Basket
 Lower 0.014" Slots, ABS Basket
 Underbedding 0.75 ft³ (75 lbs), ¼ x ¼ Gravel
 Regeneration Control Non-electric Use Meter
 Regeneration Type Countercurrent
 Meter Type 1.10 - 50.00 gpm Polypropylene Turbine
 (Kinético Open Louver Flow Nozzle)

Inlet Water Quality

Pressure Range 25 – 125 psi Dynamic Pressure
 Temperature Range 35 – 120° F
 pH Range 5 – 10 SU
 Free Chlorine Cl₂ (Max.) 2.0 mg/L
 Hardness as CaCO₃ (Max.) 49 gpg

Operating Specs

Flow Range – Overdrive (15 / 30 psig) 35.0– 47.0 gpm
 Flow Range – Alternating (15 / 30 psig) 23.0 – 33.0 gpm
 Dimensions (width x depth x height) 33" x 16" x 71"
 Weight (Operating / Shipping) 650 / 450 lbs.

Connections

Inlet / Outlet Connections Custom Adapter and E-clip
 (1 ½" Brass Sweat Fittings Included)
 Drain Connection 0.625" Tube
 Brine Line Connection 0.375" Tube
 Power None

System Part Numbers

CP 216s OD, 24 X 40 brine tank, media separate 11182
 CP 216s OD, no brine tank, media separate 11168
 CP 216s OD, empty, no brine tank 11186

Brine Tank Options

Tank Description 24" x 40"
 Brine Tank Part Number 10586
 Material HDPE
 Salt Capacity 500 lbs.

Regeneration Specifications

Regeneration Volume / Time 160 gallons / 90 minutes
 Backwash Flow Control 7.00 gpm
 Brine Refill Flow Control 0.70 gpm

Overdrive Operation

Setting	Capacity	Efficiency	Dosing	Meter Disc
24 lbs.	88,000 grains	3,700 gr./lb.	6.0 lbs./ft ³	1
40 lbs.	112,000 grains	2,800 gr./lb.	10.0 lbs./ft ³	5
Peak flow during regeneration:				35

Alternating Operation

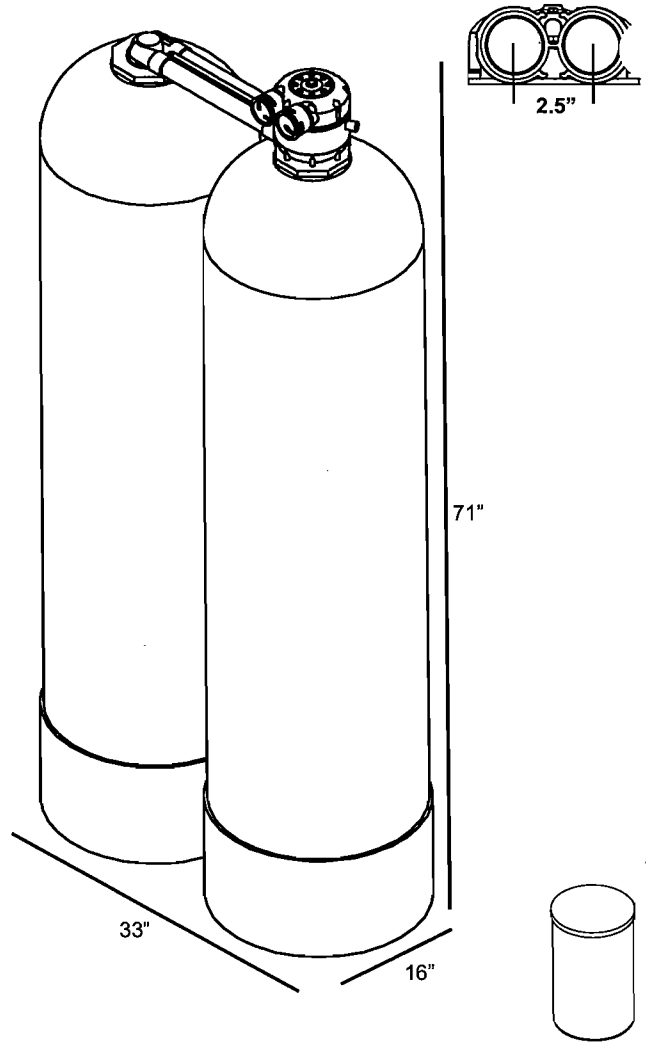
Setting	Capacity	Efficiency	Dosing	Meter Disc
24 lbs.	88,000 grains	3,700 gr./lb.	6.0 lbs./ft ³	1
40 lbs.	112,000 grains	2,800 gr./lb.	10.0 lbs./ft ³	5
Flow during regeneration (@ 15 psig):				7
Gallons/Regeneration:				23

Disc Selection

(Compensated Hardness*)

	1	2	3	4	5	6	7	8
	5	9	13	16	19	22	25	30
	6	12	16	21	25	30	35	40
	35	35	35	35	26.7	21.1	17.1	14.1
	1	2	3	4	5	6	7	8
	5	10	15	20	25	30	35	40
	7	13	20	26	32	38	43	49
	23	23	23	23	23	21.1	17.1	14.1
	15,192	7,596	5,064	3,798	3,038	2,532	2,170	1,899

*Compensated hardness in gpg = Hardness + (3 x Fe in mg/L)



DA 213 OD

System Components

Media Vessel (qty) Size	(2) 13" x 54"
Media Vessel Construction	Wrapped Polyethylene
Empty Bed Volume	3.68 ft ³
Media	3.0 ft ³ Anlon Resin
Bed Depth / Freeboard.....	46" / 8"
Riser Tube.....	1" ABS
Distributor Upper	0.014" Slots, ABS Basket
Lower	0.014" Slots, ABS Basket
Underbedding.....	None
Regeneration Control	Non-electric Use Meter
Regeneration Type.....	Countercurrent
Meter Type.....	0.75 - 40.00 gpm Polypropylene Turbine (Kineticco Full Louver Flow Nozzle)

Inlet Water Quality

Pressure Range	25 - 125 psi Dynamic Pressure
Temperature Range	35 - 120° F
pH Range	5 - 10 SU
Free Chlorine Cl ₂ (Max.)	0.05 mg/L
TDS (Max.).....	1,000 gpg
Hardness as CaCO ₃ (Max.)	5 gpg
Alkalinity as % of TDS (Min.).....	60%
Alkalinity (Max.).....	600 mg/L

Operating Specs

Service Flow Rate	12.0 gpm
Dimensions (width x depth x height).....	27" x 13" x 60"
Weight (Operating / Shipping).....	450 / 300 lbs.

Connections

Inlet / Outlet Connections	Custom Adapter and E-clip (1 1/2" Brass Sweat Fittings Included)
Drain Connection	0.625" Tube
Brine Line Connection.....	0.375" Tube
Power.....	None

System Part Numbers

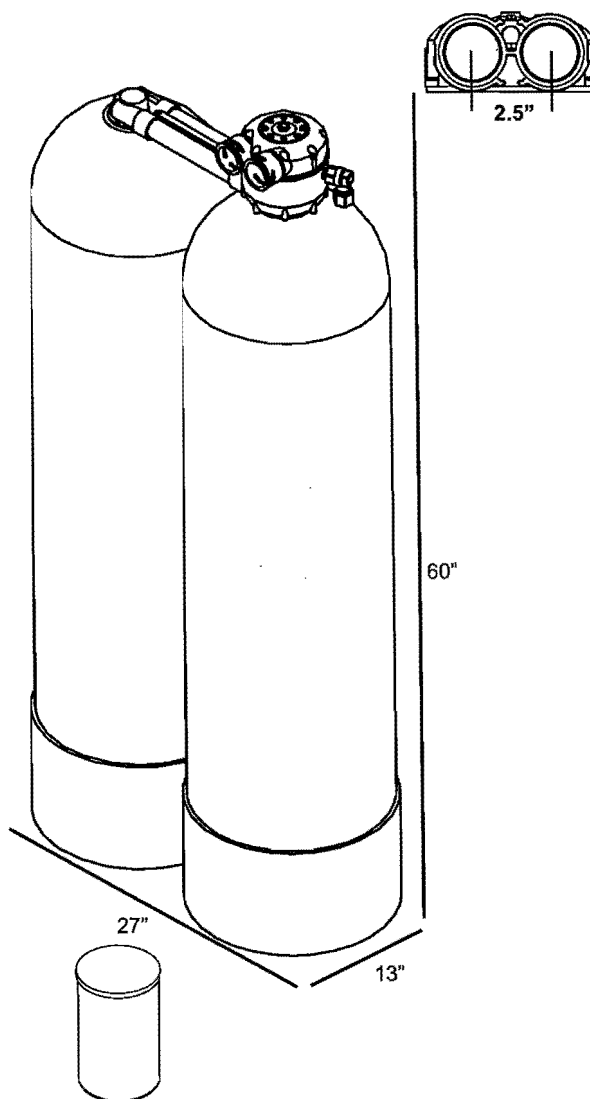
CP 213s OD, empty, no brine tank	11184
24" x 40" Brine Tank	10586
Dealkalization Resin (6 ft ³ required)	69612
1/2 Louver Nozzle (must be changed)	11018

Brine Tank Options

Tank Description	24" x 40"
Brine Tank Part Number	10586
Material	HDPE
Salt Capacity	500 lbs.

Regeneration Specifications

Regeneration Volume / Time	142 gallons / 90 minutes
Backwash Flow Control.....	5.00 gpm
Brine Refill Flow Control.....	0.70 gpm



Disc Selection (Alkalinity in mg/L)

	1	2	3	4	5	6	7	8
Meter Disc	70	150	225	300	375	450	525	600
25 lbs. Setting								
Gallon/Regeneration:	4,000	2,000	1,333	1,000	800	667	571	500

NR 213 OD

System Components

Media Vessel (qty) Size (2) 13" x 54"
 Media Vessel Construction Wrapped Polyethylene
 Empty Bed Volume 3.68 ft³
 Media 3.0 ft³ Anion Resin
 Bed Depth / Freeboard 46" / 8"
 Riser Tube 1" ABS
 Distributor Upper 0.014" Slots, ABS Basket
 Lower 0.014" Slots, ABS Basket
 Underbedding None
 Regeneration Control Non-electric Use Meter
 Regeneration Type Countercurrent
 Meter Type 0.75 - 40.00 gpm Polypropylene Turbine
 (Kinetico full louver flow nozzle)

Inlet Water Quality

Pressure Range 25 – 125 psi Dynamic Pressure
 Temperature Range 35 – 120° F
 pH Range 5 – 10 SU
 Free Chlorine Cl₂ (Max.) 0.05 mg/L
 TDS (Max.) 1,000 gpg
 Hardness as CaCO₃ (Max.) 5 gpg
 Nitrate as % of SO₄ + NO₃ (Min.) 20%
 Nitrate (Max.) 250 mg/L

Operating Specs

Service Flow Rate 12.0 gpm
 Dimensions (width x depth x height) 27" x 13" x 60"
 Weight (Operating / Shipping) 450 / 300 lbs.

Connections

Inlet / Outlet Connections Custom Adapter and E-clip
 (1 ½" Brass Sweat Fittings Included)
 Drain Connection 0.625" Tube
 Brine Line Connection 0.375" Tube
 Power None

System Part Numbers

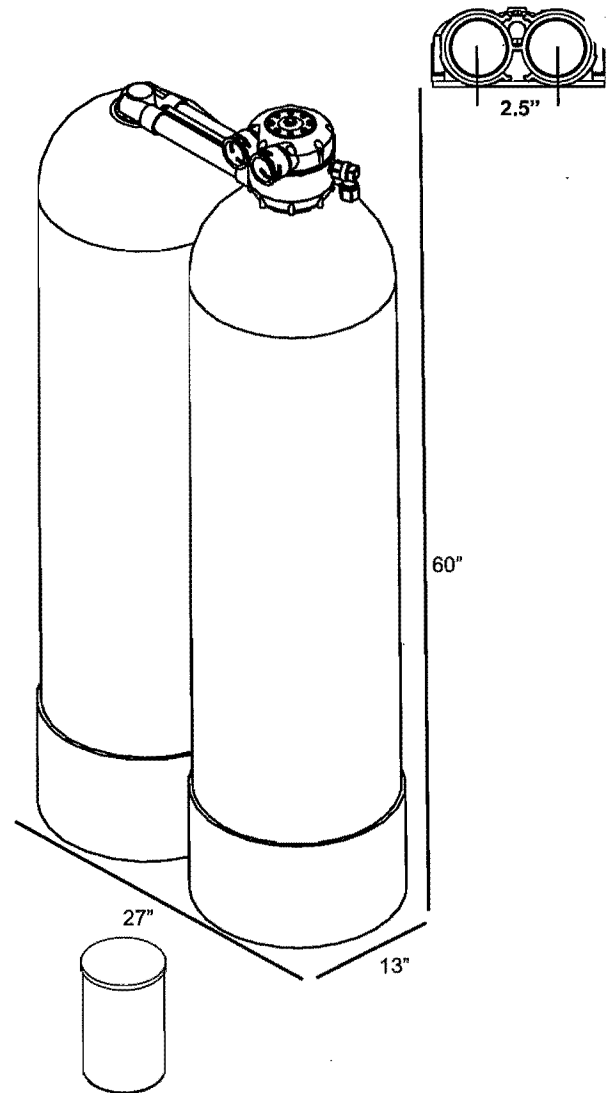
CP 213s OD, empty, no brine tank 11184
 24 x 40" Brine Tank 7938
 Nitrate Selective Resin (6 ft³ required) 71034

Brine Tank Options

Tank Description 24" x 40"
 Brine Tank Part Number 10586
 Material HDPE
 Salt Capacity 500 lbs.

Regeneration Specifications

Regeneration Volume / Time 142 gallons / 90 minutes
 Backwash Flow Control 5.00 gpm
 Brine Refill Flow Control 0.70 gpm



Disc Selection

Meter Disc 25 lbs. Setting Gallon/Regeneration:	Disc Selection (Nitrates in mg/L)							
	1	2	3	4	5	6	7	8
	35	70	100	130	160	190	220	250
	8,930	4,465	2,977	2,233	1,786	1,488	1,276	1,166

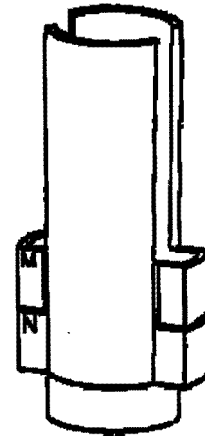
Brine Drum Settings

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. 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".

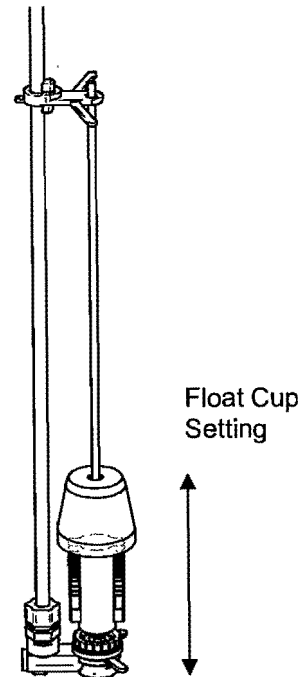


**Adjuster Tube
(setting = M)**

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.

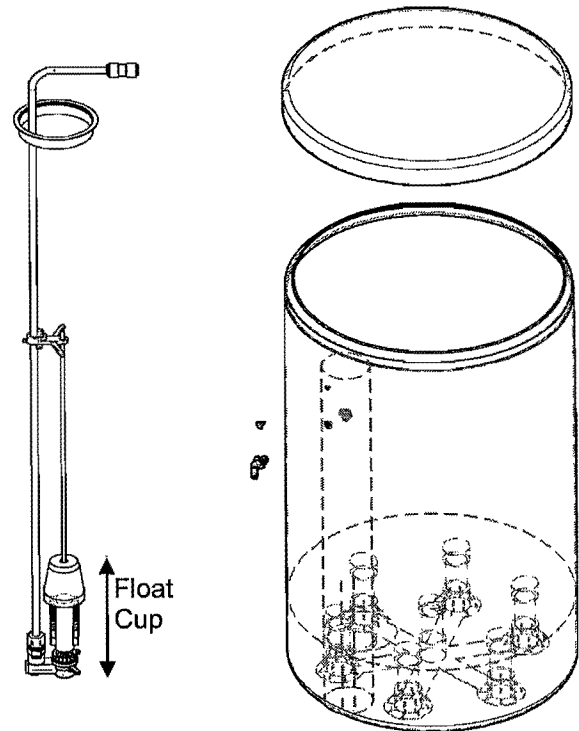
The CP units require the adjuster tube and float cup to be set.



Brine Valve Settings

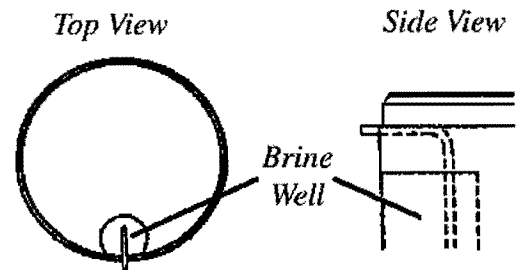
24 x 40 Brine Drum Valve Adjustment

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



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 $\frac{3}{8}$ " bent tube is along the back of the brine well away from the brine drum wall. The $\frac{3}{8}$ " bent tube snaps into a notch and extends from the brine drum about 1 inch.



Brine Valve Installation



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

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 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 ½" 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 toward salt.

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 ▪ Re-gear 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 by-pass is open	<ul style="list-style-type: none"> <input type="checkbox"/> An open by-pass allows water to flow around the system without any treatment at all 	<ul style="list-style-type: none"> ▪ Close the by-pass

- | | | |
|---|---|--|
| 7. The by-pass is leaking | <ul style="list-style-type: none"> ❑ 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 by-pass that is leaking. | <ul style="list-style-type: none"> ▪ Repair or replace the by-pass. |
| <hr/> | | |
| 8. Brine drum does not refill or overfills | <ul style="list-style-type: none"> ❑ The brine valve is set incorrectly ❑ The brine valve is non-conforming ❑ The brine drum is dirty ❑ The venturi nozzle is plugged ❑ The brine elbow screen is plugged. | <ul style="list-style-type: none"> ▪ Set the brine valve according to instructions on the brine valve installation sheet in the owner's pack or tech manual ▪ Replace the brine valve ▪ Clean out the brine drum ▪ Clean out Level 3 venturi throat and molded venturi nozzle (do <i>not</i> use a paper clip!) ▪ 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.



OWNERS MANUAL
COMMERCIAL PLUS SOFTENER SERIES

© 2009, Kinetico Incorporated
Product No. 11160D