

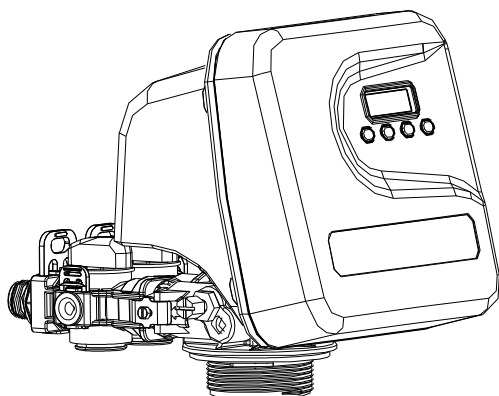
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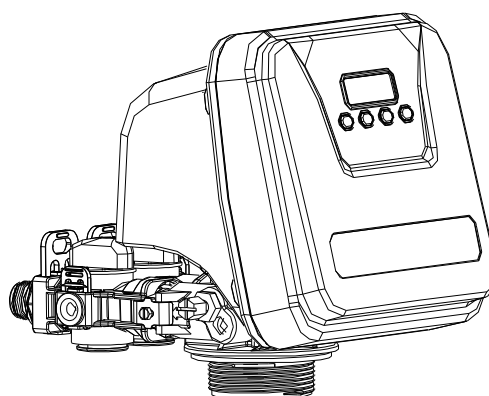
BNT465/BNT565 Series Valve Operation Manual

Introduction

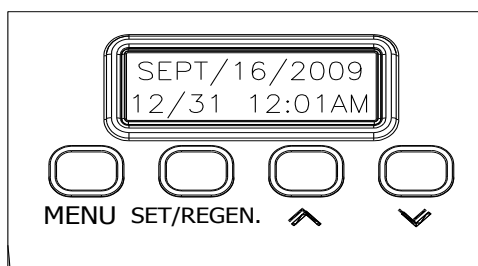
This valve is controlled with simple, user-friendly electronics displayed on a LCD screen. The main page displays the current time. In addition, the main page also shows key valve information including: regeneration mode, volume remaining (meter mode), regeneration days remaining (timer mode).



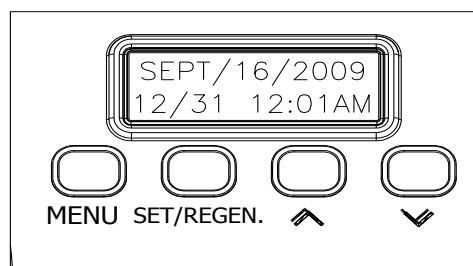
BNT465 Series Outline



BNT565 Series Outline



Bnt465 Key Pad



Bnt565 Key Pad

Main Functions

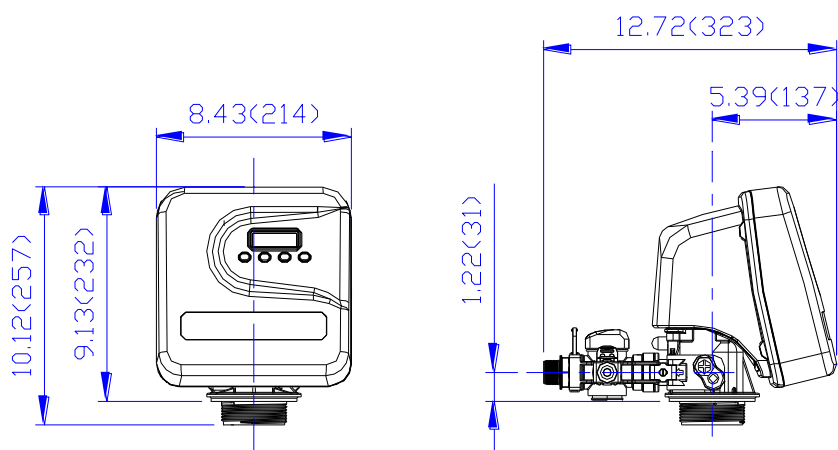
- Valve Operation Mode:
 - 1. SOFTENER: Standard water softener operation.
 - 2. FILTER: Automatic backwashing filters such as Multi-Media Depth or Carbon Filter.
- Regeneration Mode:
 - 1. Calendar Clock 2. Meter Immediate 3. Meter Delayed
 - 4. Meter Override
- Water Hardness can be adjusted.
User can adjust the mixing valve to get proper water hardness (optional for softener valve).
- Display Format:
Metric format and US format are available to meet the different customers' requirements.

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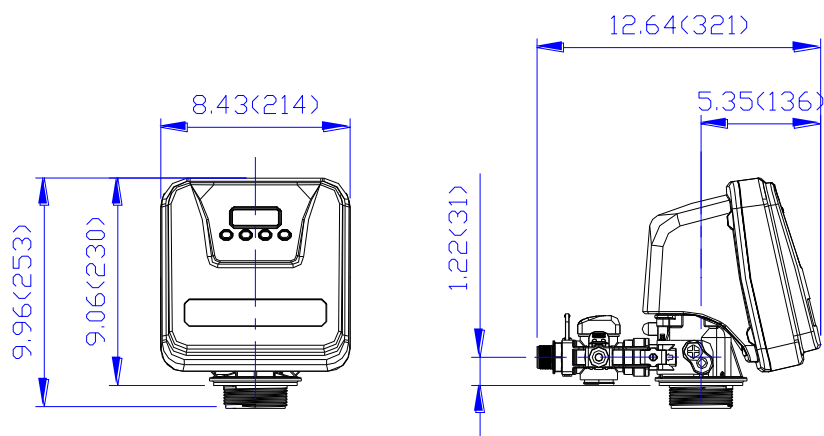
- Multi-Language Function:
Chinese, English and Spanish are available to meet the different country.
- Three default settings are available:
 1. Large capacity mode (ab. L).....fit the large size tank;
 2. Medium capacity mode (ab. M).....fit the medium size tank;
 3. Small capacity mode (ab. S).....fit the small size tank.
- Auto-locking:
All keys will be locked after 3 minutes during the stand-by status. Press and hold "MENU" key for 3 seconds to unlock.

Specifications

- Hydrostatic Test Pressure350 psi (24.15 bar)
- Working Pressure.....20~125 psi (1.38~8.62 bar)
- Working Temperature.....1℃~39℃
- Riser Pipe Diameter Required.....1.050 inch (26.7mm)
- Electrical Adapter.....Input: AC110V/AC240V, 50Hz/60Hz; Output: AC12V
- Pressure Tank Thread.....2.5"NPSM
- Inlet/Outlet Connector.....1", 3/4", 1/2" (PPR, PPO, Brass)



BNT465 Series Dimensional Drawing (unit: inch, mm in brackets)



BNT565 Series Dimensional Drawing (unit: inch, mm in brackets)

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Programming

1. Key Definition:

Menu key “”:

- Press this key to enter or exit the menu.
- Press and hold this key for 3 seconds to unlock keys locked at standby status.

Set/Regen. key “”:

- Press this key to select a program or to save the settings.
- Press and hold the key for 3 seconds at standby status to enter the manual regeneration interface.

Up and Down key “”, “”:

- Press the key to increase or decrease the value of the settings.
- Press the key to enter the previous or the next menu.

2. Setting Methods:

- Press the key “” to enter the menu.
- Press the key “” or “” to select a parameter.
- Press the key “” to make the parameters flashing.
- Press the key “” or “” to change the value.
- Press the key “” to save the setting.
- Press the key “” or “” to select other parameters.
- Follow the above steps to change other parameters.
- Press the key “” to exit settings.

You can only change the flashing parameters.

Program will be back to standby status if any key was not operated in 1 minute.
Without being operated in 3 minutes, the keys will be locked.

3. Inquiry Function:

Press the key “” and “” simultaneously at the standby status, the screen will display different regeneration information at different regeneration mode.

- **Calendar Clock:**

The first row shows the days remaining (02) of one regeneration cycle in days,
“07” refers to regeneration cycle in days.

The second row shows regeneration time, “A” refers to a.m., “P” refers to p.m.

REG.DAYS: 02/07 REG.TIME 02:00A

- **Meter Immediate:**

The first row shows the volume remaining of one regeneration cycle in meter.

The second row shows total usage.

USED: 9999 TOTAL 999999

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- Meter Delayed:

The first row shows the volume remaining (9999) of one regeneration cycle in meter and regeneration time. "A" refers to a.m., "P" refers to p.m.

The second row shows total usage.

USED9999 02:00A
TOTAL 999999

- Meter Override:

The first row shows the volume remaining (9999) of one regeneration cycle in meter and regeneration cycle in days. "02" refers to the days remaining, "07" refers to regeneration cycle in days.

The second row shows total usage.

USED9999 02/07
TOTAL 999999

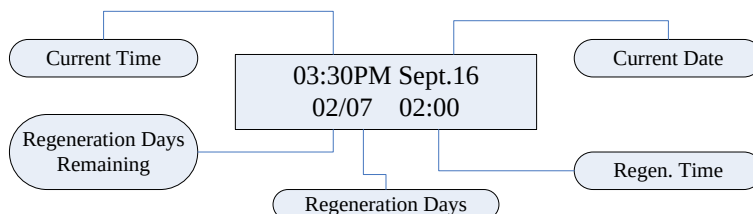
4. System Initialization:

When power is first supplied, the valve may take about two minutes to initialize, and the valve will show:

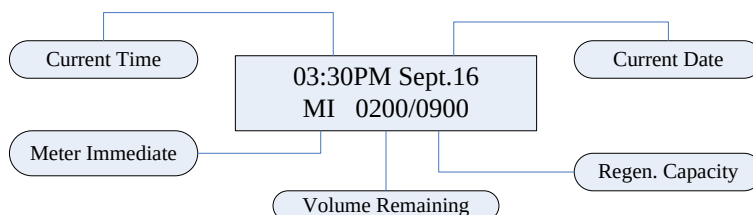
INITIALIZING
WAIT PLEASE

Any key will be overridden at this time. When the valve reaches the service position, it will display:

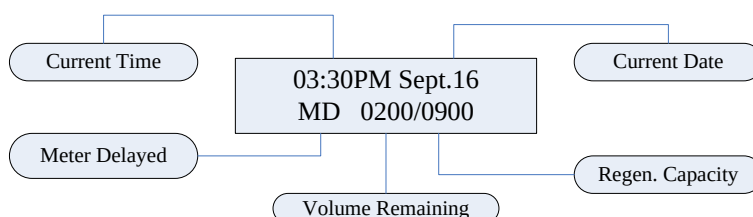
Regeneration Mode: Calendar Clock



Regeneration Mode: Meter Immediate

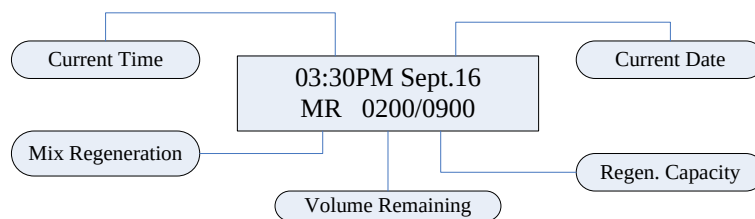


Regeneration Mode: Meter Delayed

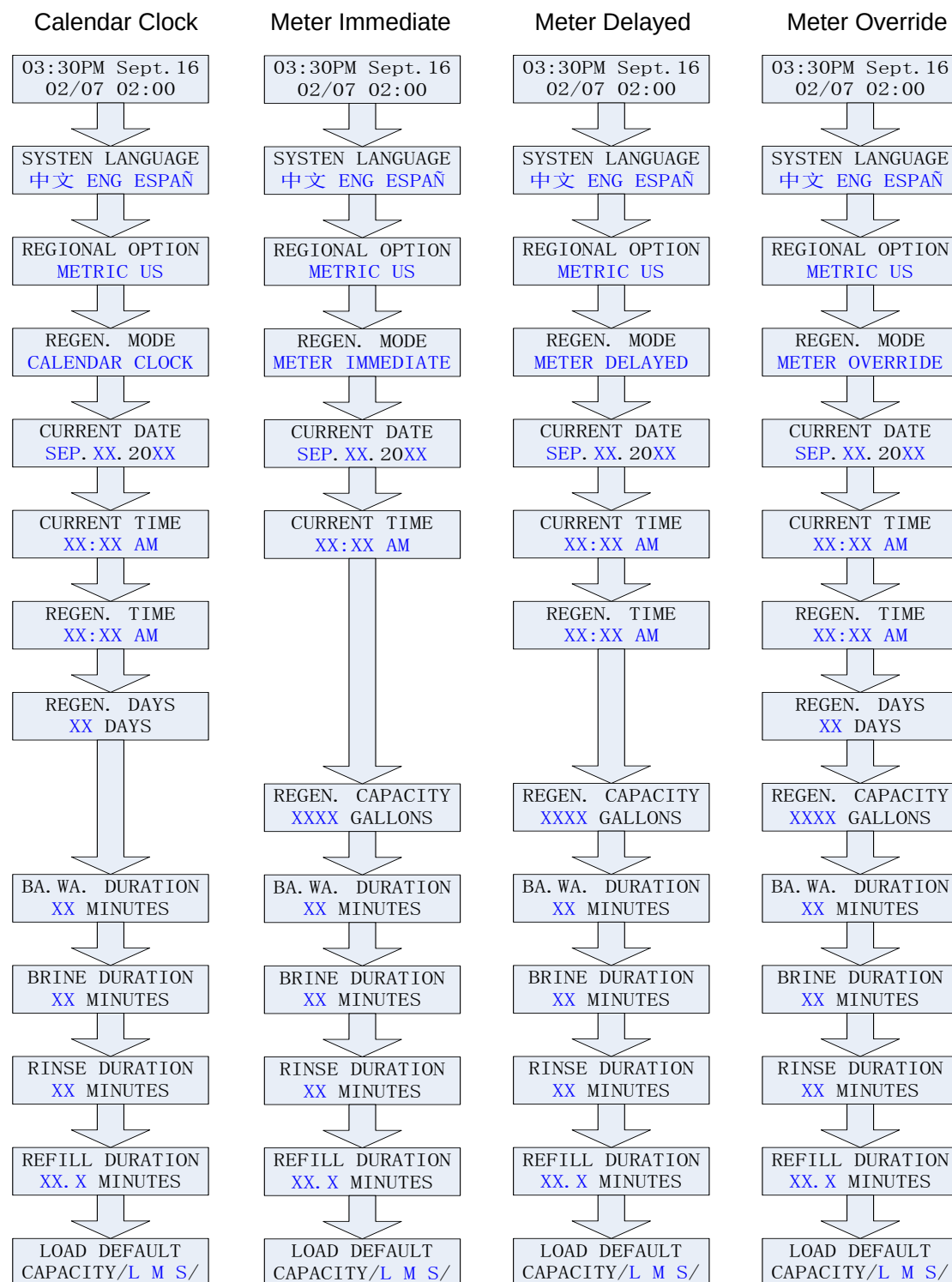


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Regeneration Mode: Meter Override



5. Menu Diagram at Different Regeneration Modes:



There is no "BRINE DURATION" and "REFILL DURATION" in filter valve.

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PARAMETER		OPTIONS	DESCRIPTION
1	SYSTEM LANGUAGE	中文	This option controls which language should be used in the valve display.
		ENGLISH	
		SPANISH	
2	REGIONAL OPTION	METRIC	This option controls which unit format should be displayed in the valve display.
		US	
3	REGEN. MODE	CALENDAR CLOCK	The unit will initiate a regeneration at the next pre-set regeneration time based on the interval of days between regeneration days.
		METER IMMEDIATE	The unit will initiate a regeneration immediately after the volume remaining reaches zero.
		METER DELAYED	This is the most common setting. When the volume remaining reaches zero, the system will initiate a regeneration at the next pre-set regeneration time.
		METER OVERRIDE	When the volume remaining reaches zero, the system will initiate a regeneration at the next pre-set regeneration time. If the days between regeneration are reached before the volume remaining reaches zero, the system will override the meter setting and initiate a regeneration.
4	CURRENT DATE		This setting controls the current date. The date is used to track the last time the system regenerated.
5	CURRENT TIME		This setting controls the current time of day.
6	REGEN. TIME		This setting controls the time of day when a regeneration will start.
7	REGEN. DAYS		This value is the interval (days) between regenerations. It is used to determine how many days between regenerations
9	REGEN. CAPACITY		This value is the total capacity between regenerations. It is used to determine how many gallons can be used between regenerations
10	BA.WA. DURATION		This setting controls the length of time for the unit to clean the bed by reversing the flow of water upwards through the bed and out to the drain.
11	BRINE DURATION		This setting controls the length of time for the unit to draw regeneration (brine for softeners) from the brine tank and slowly rinse the media tank from the top to the bottom.
12	RINSE DURATION		This setting controls the length of time to give the tank a final rinse from the top to the bottom in order to remove any last traces of the regeneration from the tank.
13	REFILL DURATION		This setting controls the length of time which the brine valve will open to refill the brine tank with water in order to produce the salt solution for next regeneration. The water accurately measured through the valves brine line flow control to make a precise quantity of salt solution.
14	LOAD DEFAULT		This setting allows the current settings to be erased and changed back to the default settings.

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6. Default Settings.

LOAD DEFAULT
CAPACITY/L M S /

Three default settings are available:

- Large capacity mode (ab. L).....fit the large size tank;
- Medium capacity mode (ab. M).....fit the medium size tank;
- Small capacity mode (ab. S).....fit the small size tank.

Default value as follows:

		Large Capacity	Medium Capacity	Small Capacity
BACKWASH DURATION	(minute)	15	10	6
BRINE DURATION	(minute)	50	35	20
RINSE DURATION	(minute)	10	8	5
REFILL DURATION	(minute)	7	5	3
REGEN. DAYS	(day)	8	5	3
REGEN. CAPACITY FOR METER VALVE	(Gallon)	2000	1300	800

Manual Regeneration

Press and hold the key “” for 3 seconds to unlock keys.

In stand-by position,you can press and hold the key ‘’ for 5 seconds to into the manual regeneration interface:

MANU. REGEN.
DELAY IMMEDIATE

(1) If you choose ‘DELAY’ and press key ‘’ to exit,the valve will regeneration in next REGEN. TIME (default is 02:00);

Note: The regeneration mode "METER IMMEDIATE" has no 'DELAY' choice here.

(2) If you choose ‘IMMEDIATE’ and press key ‘’ to exit,the valve will regeneration immediately.

When regeneration started, the screen will display:

BACKWASHING


“BACKWASHING” starts flashing, when the valve reaches “BACKWASH” position, “BACKWASHING” will stops flashing. Vertical bars (the second raw) will be decreased on the way of regeneration. Pressing any key will automatically advance the valve to the next cycle position: BRINE, Screen will display:

BRINING


Valve will be advanced to the rest of the regeneration (RINSE and REFILL) just like the above steps.

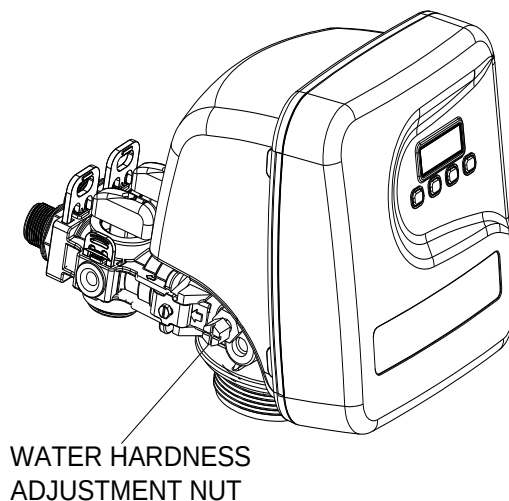
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Water Hardness Adjustment (Optional for Softener Valve)

Users can adjust the Water Hardness Adjustment Nut to get their desired water hardness (optional for softener valve)

Operation methods:

Rotate the Water Hardness Adjustment Nut in a clockwise direction. The bigger rotation angle, the higher water hardness.



Optional Parts

The following optional parts are used for both Bnt165 and Bnt265.

1. Inlet/Outlet Screw Standards:

Table I

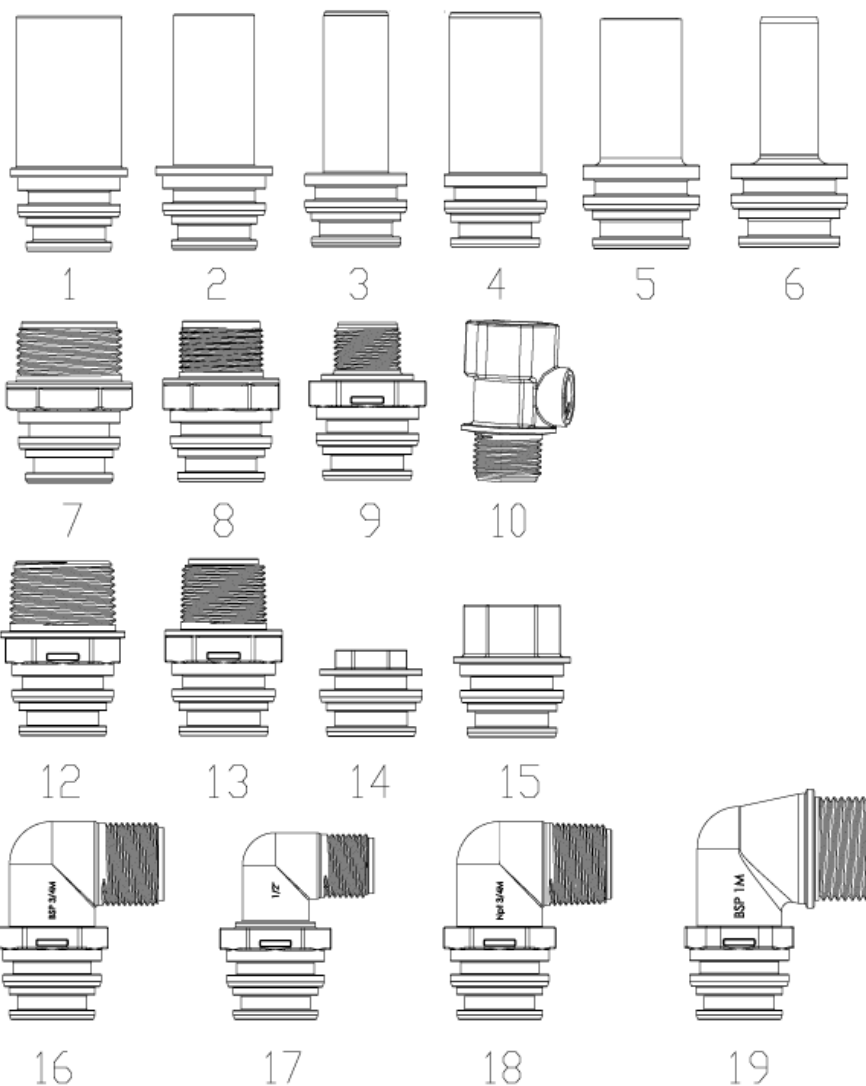
BSP Screw		NPT Screw	
Straight	90° Elbow	Straight	90° Elbow
1/2"、 3/4"、 1"	1/2"、 3/4"、 1"	3/4",1"	3/4"

2 . Inlet/Outlet Screw Adaptor (Optional):

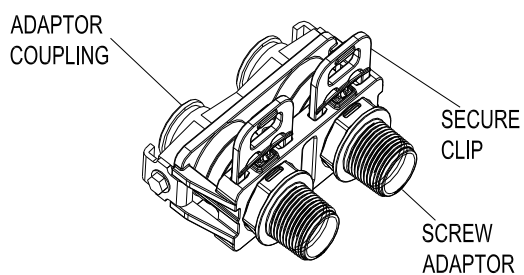
No.	Name	No.	Name
1	PPR Adaptor 1'	10	Nylon tri-pieces 4F×2F×4M
2	PPR Adaptor 3/4	11	Adaptor III Connect Screw NPT1M
3	PPR Adaptor 1/2	12	Adaptor III Connect Screw NPT6M
4	Adaptor (American standard 1' black)	13	Adaptor III Universal plug
5	Adaptor (American standard 6 ")	14	Adaptor III Connect screw 4F

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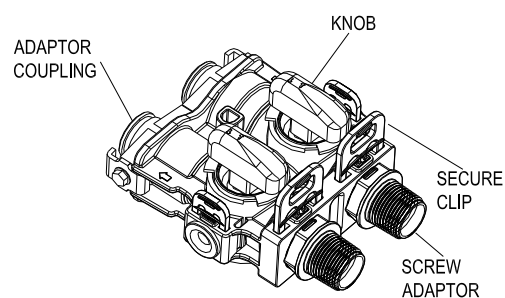
6	Adaptor (American standard 4 ")	15	Adaptor III Elbow screw 6M
7	Adaptor III connect screw 1M	16	Adaptor III Elbow screw 4M
8	Adaptor III connect screw 6M	17	Adaptor III Elbow screw NPT6M
9	Adaptor III connect screw 4M	18	Adaptor III Elbow screw 1M



3. Inlet/Outlet Connections Types:



STANDARD CONNECTION ASSEMBLY

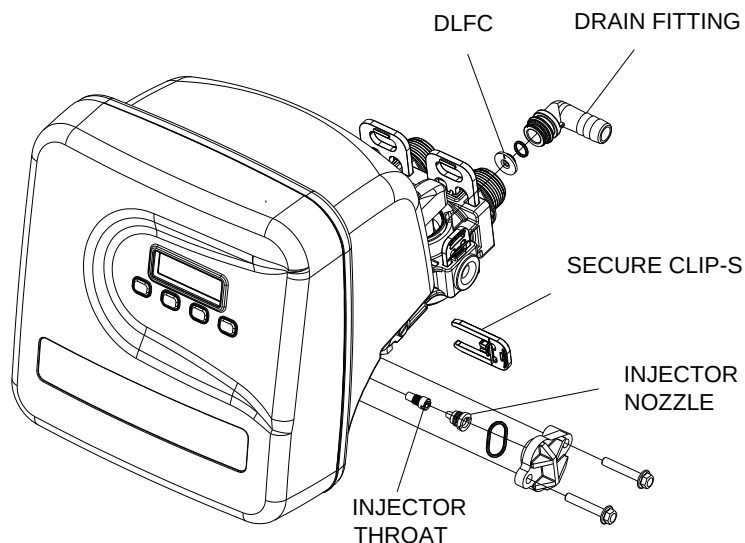


BYPASS ASSEMBLY

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4. Drain line Flow Controls (DLFC) and Injector:

Replacing Injector and DLFC according to the following picture.



For reference only: Different Size injector & DLFC is available for different **Softener** tanks as follows

Item	Tank Size	Water Softener						
		Injector			DLFC		BLFC	
		Serial number	Color	Spec	Serial number	Spec	Serial number	Spec
1	0722	30040079	Gray	000#	05056185	1# 1.5GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
2	0735	30040079	Gray	000#	05056185	1# 1.5GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
3	0815	30040079	Gray	000#	05056186	2# 2.0GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
4	0817	30040079	Gray	000#	05056186	2# 2.0GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
5	0835	30040081	Purple	00#	05056186	2# 2.0GPM	05056206	0.2 GPM
		30040082					05056076	0.3 GPM
6	0844	30040081	Purple	00#	05056186	2# 2.0GPM	05056206	0.2 GPM
		30040082					05056076	0.3 GPM
7	0935	30040083	Red	0#	05056186	2# 2.0GPM	05056206	0.2 GPM
		30040084					05056076	0.3 GPM
8	1015	30040079	Gray	000#	05056187	3# 2.4GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
9	1017	30040079	Gray	000#	05056187	3# 2.4GPM	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
10	1026	30040085	White	1#	05056187	3# 2.4GPM	05056206	0.2 GPM
		30040086					05056076	0.3 GPM
							05056178	0.7 GPM

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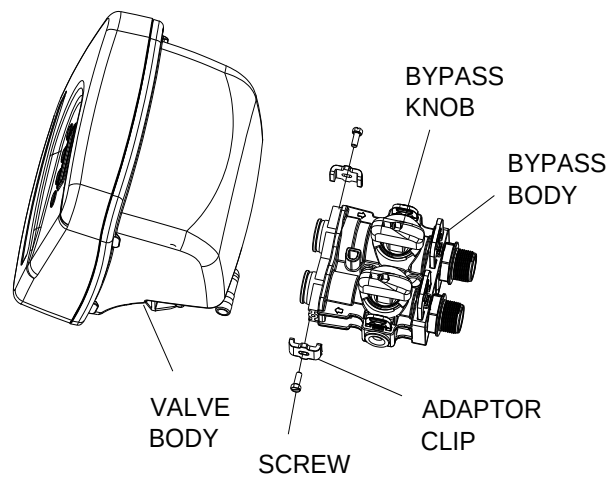
11	1035	30040085 30040086	White	1#	05056187	3# 2.4GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
12	1044	30040085 30040086	White	1#	05056187	3# 2.4GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
13	1054	30040085 30040086	White	1#	05056187	3# 2.4GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
14	1144	30040087 30040088	Blue	2#	05056169	5# 3.5GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
15	1252	30040089 30040090	Yellow	3#	05056170	6# 4.0GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
16	1354	30040089 30040090	Yellow	3#	05056171	7# 5.0GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
17	0713	30040079 30040080	Gray	000#	05056185	1# 1.5GPM	05056206 05056076	0.2 GPM 0.3 GPM

For reference only: Different Size DLFC is available for different **Filter** tanks as follows

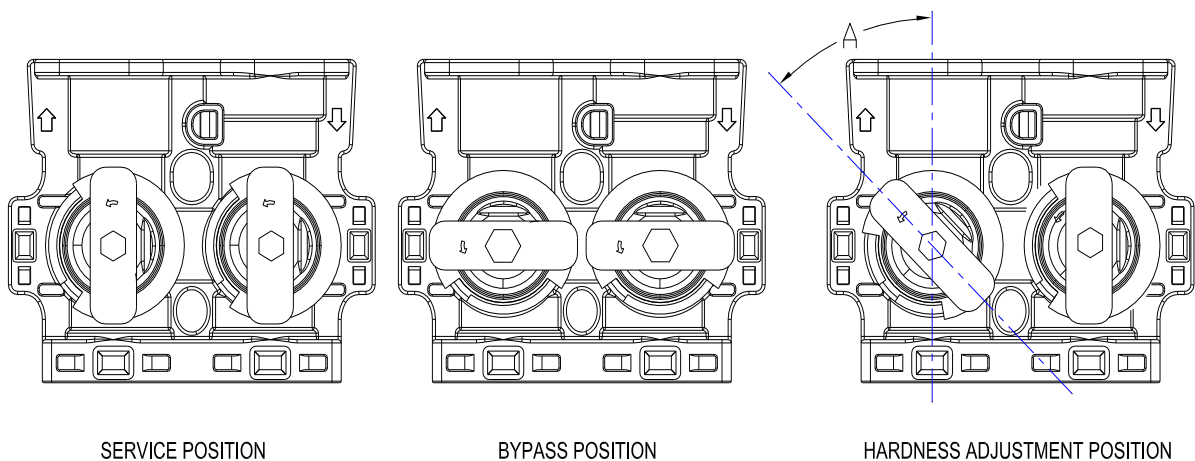
Tank Size	Serial number	DLFC size
07series	05056187	3# 2.4GPM
08series	05056188	4# 3.0GPM
09series	05056169	5# 3.5GPM
10series	05056170	6# 4.0GPM
11series	05056171	7# 5.0GPM
12series	NO DLFC	NO DLFC

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5. Bypass Assembly

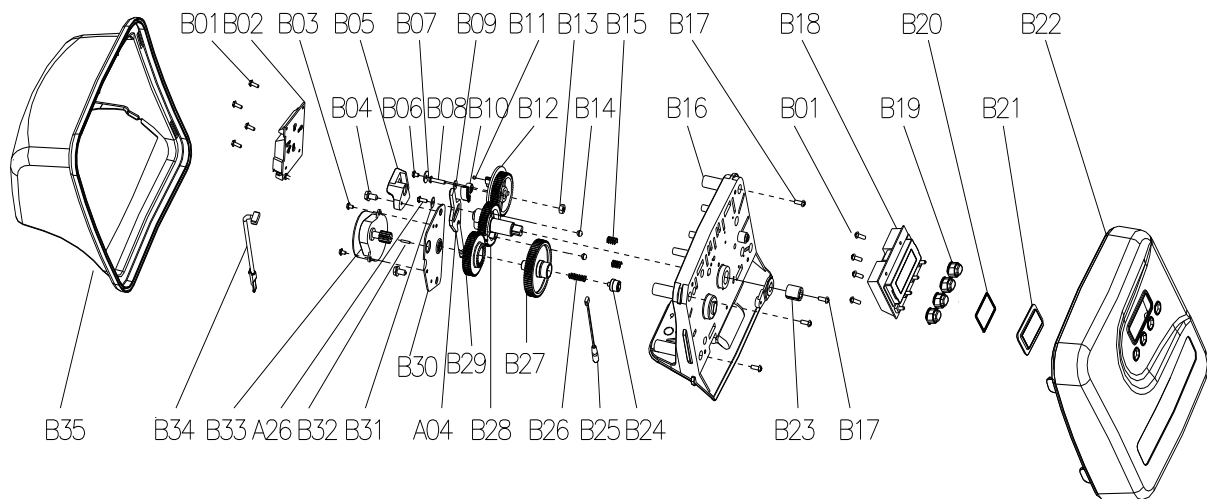


Bypass valve is provided with many functions such as bypass, water hardness adjustment. Different angles of bypass knob have different functions (see following picture). The bigger angle (value A), the higher water hardness in hardness adjustment position.



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Valve Powerhead Assembly



Bnt465 Powerhead Assembly

BNT465/BNT565 Series Valve Operation Manual

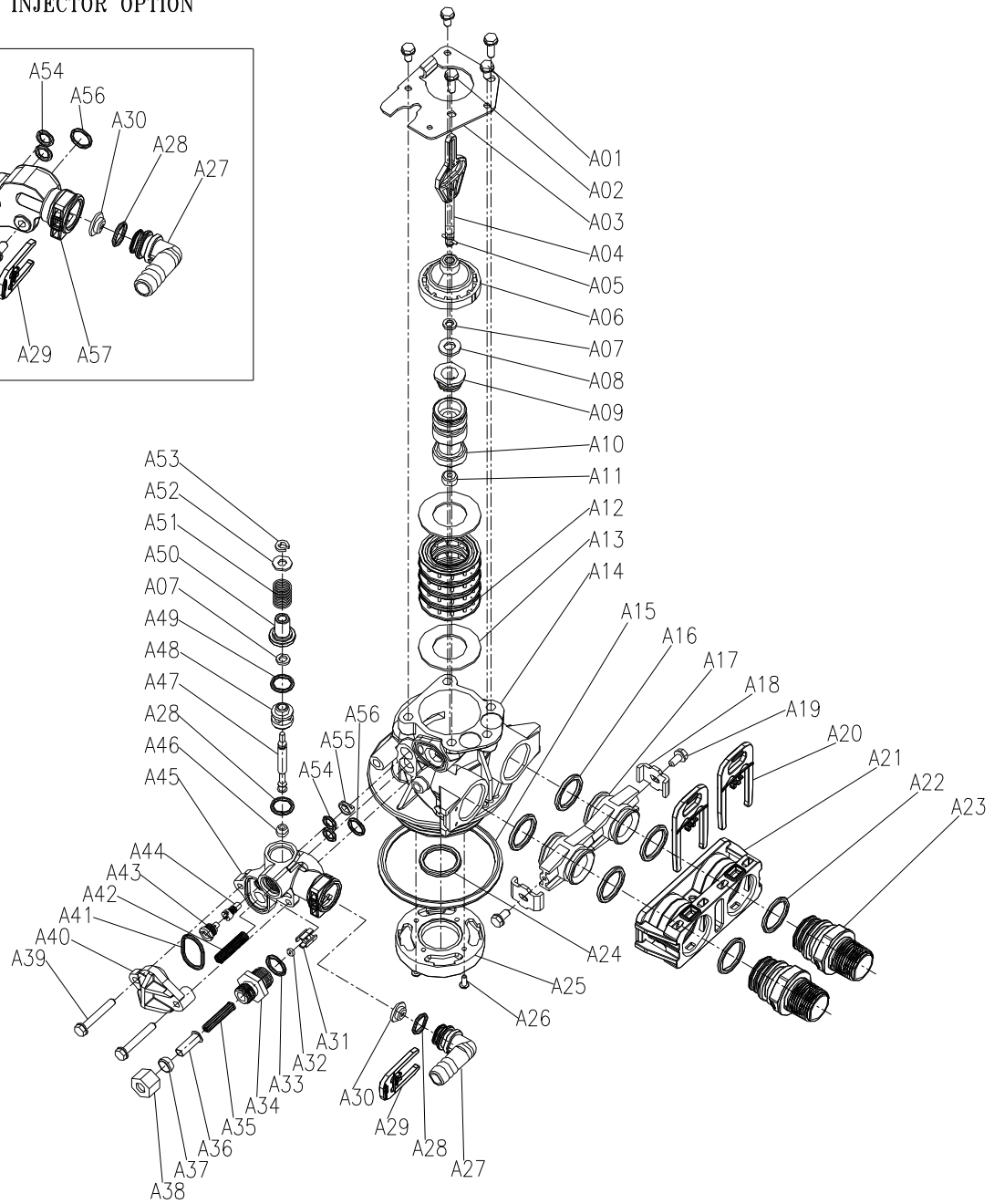
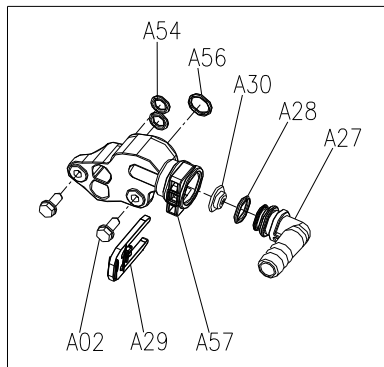
Bnt465 /565Powerhead Assembly Parts List

Item No.	Part No.	Part Description	Quantity
B01	05010037	Screw-ST2.9×10	8
B02	05030010	Bnt85 Main Pcb	1
B03	05056082	Screw-M3×5	2
B04	05056136	Screw-ST3.5×13(Hexagon with Washer)	2
B05	05010045	Piston Stem Holder	1
B06	05056083	Screw-M4x14	1
B07	05056141	Washer-4x12	1
B08	05056166	Screw-ST4.2×12(Large Wafer)	1
B09	13111004	Washer-4x9	1
B10	05056016	Refill Regulator	1
B11	05010023	Magnet-φ3×2.7	1
B12	05056015	Brine Gear	1
B13	05056089	Nut-M4	1
B14	05056092	Ball-1/4inch	2
B15	05056095	Spring Detent	2
B16	05056522	BNT365 Housing	1
B17	05056084	Screw-ST3.5x13	5
B18	05030020	Bnt85 Display	1
B19	05056529	BNT465 Button	4
B20	26010047	O Ring (EPDM)40×1.8	1
B21	05056528	BNT465 Cover	1
B22	05056527	BNT465 Front Cover	1
	05056531	BNT565 Front Cover	1
B23	05056554	BNT265 Locking Konb	1
B24	05056502	Spring Retainer	1
B25	05010029	Power Cabel	1
B26	05056094	Spring Idler	1
B27	05056002	Idler Gear	1
B28	05056005	Main Gear	1
B29	05056501	Bnt165 Drive Gear	1
A04	05010081	Bnt65 Piston Rod	1
B30	05056045	Motor Mounting Plate	1
B31	05056139	Washer-3x13	1
B32	05056098	Motor Pin	1
A26	13000426	Screw-ST2.9×13(Large Wafer)	1
B33	05056510	Motor-12v/2rpm	1
B34	05010031	Meter Assembly	1
B35	05056523	BNT365 Cover	1

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Valve Body Assembly

FILTER INJECTOR OPTION



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Bnt465/Bnt565 Valve Body Assembly Parts List

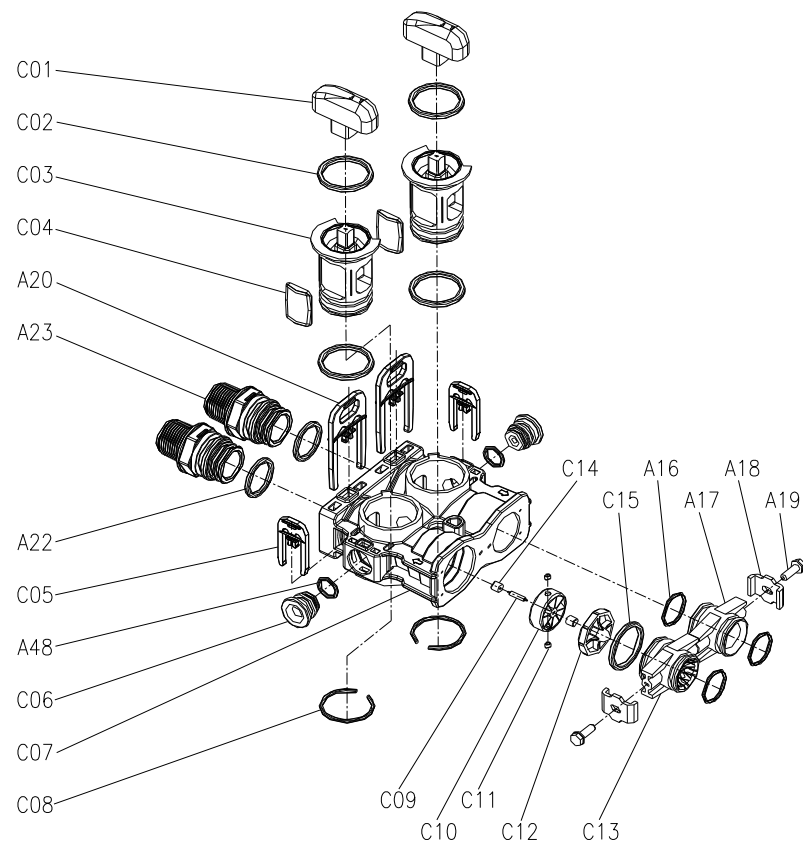
Item No.	Part No.	Part Description	Quantity
A01	05056087	Screw-M5×12(Hexagon)	3
A02	05056088	Screw-M5×16(Hexagon with Washer)	2
A03	05056047	End Plug Retainer	1
A04	05010081	Bnt65 Piston Rod	1
A05	05056097	Piston Pin	1
A06	05056023	End Plug	1
A07	05056070	Quad Ring	2
A08	05056024	End Plug Washer	1
A09	05056022	Piston Retainer	1
A10	05056520	Piston (Electrical C)	1
A11	05056104	Muffler	1
A12	05056021	Spacer	4
A13	05056073	Seal	5
A14	05056019	Bnt65 Valve Body	1
A15	05056063	O-ring-φ78.74×5.33	1
A16	05056129	O-ring-φ23×3	4
A17	05056025	Adaptor Coupling	2
A18	05056044	Adaptor Clip	2
A19	13000327	Screw-M4×12(Hexagon with Washer)	2
A20	21709003	Secure Clip	2
A21	05056140	Valve Connector	1
A22	26010143	O-ring-φ22.4×3.55	2
A23	21319006	Screw Adaptor	2
A24	26010103	O-ring-φ25×3.55	1
A25	07060007	Valve Bottom Connector	1
A26	13000426	Screw-ST2.9×13(Large Wafer)	2
A27	05010082	Drain Fitting-B	1
A28	05056134	O-Ring-φ12×2	2
A29	05056172	Secure Clip—S	1
A30	05056186	DLFC-2#	1
A31	05056035	BLFC Button Retainer	1
A32	05056191	BLFC-2#	1
A33	05056138	O-Ring-φ14×1.8	1
A34	05056100B	BLFC Fitting	1
A35	05056106	Brine Line Screen	1
A36	05056107	BLFC Tube Insert	1
A37	05056033	BLFC Ferrule	1
A38	05056108	BLFC Fitting Nut	1
A39	05056086	Screw-M5×30(Hexagon with Washer)	2
A40	05056029	Injector Cover	1
A41	05056205	O-Ring-φ23.9×1.8	1

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A42	05056103	Injector Screen	1
A43	05056027	Injector Nozzle	1
A44	05056028	Injector Throat	1
A45	05056177	Injector Body-B	1
A46	05056075	Injector Seat	1
A47	05056054	Injector Stem	1
A48	05056031	Injector Spacer	1
A49	05056081	O-Ring- $\phi 12.5 \times 1.8$	1
A50	05056030	Injector Cap	1
A51	05056093	Injector Screen	1
A52	05010049	Special Washer	1
A53	05056105	Retaining Ring	1
A54	05056067	O-Ring- $\phi 7.8 \times 1.9$)	2
A55	05056037	Air Disperser	1
A56	05056066	O-Ring- $\phi 11 \times 2$	1
A57	05056165	Injector Body (Filter)	1

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Bypass Assembly



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Bypass Assembly Parts List

Item No.	Part No.	Part Description	Quantity
C01	05056147	Bypass Knob	2
C02	05030013	O-Ring- $\phi 30 \times 2.65$	4
C03	05056148	Bypass Plug	2
C04	05056149	Bypass Seal	2
A20	21709003	Secure Clip	2
A23	21319006	Screw Adaptor	2
A22	26010143	O-Ring- $\phi 22.4 \times 3.55$	2
C05	05056172	Secure Clip—S	2
A48	05056134	O-Ring- $\phi 12 \times 2$	1
C06	05056146	Bulkhead	2
C07	05056145	Bypass Body	1
C08	05056150	Collar— $\phi 32 \times 2.5$	2
C09	05010079	Impeller Pin	1
C10	05010014	Impeller	1
C11	05010078	Magnet- $\phi 4 \times 3$	2
C12	05010077	Impeller Holder	1
C13	05010083	Adaptor Distributor	1
C14	05010019	Pin Holder	2
C15	26010046	O-ring- $\phi 27 \times 3$	1
A16	05056129	O-ring- $\phi 23 \times 3$	3
A17	05056025	Adaptor Coupling	1
A18	05056044	Adaptor Clip	2
A19	13000327	Screw-M4 $\times$ 12(Hexagon with Washer)	2

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General Valve Installation

Water Pressure	Minimum 25 PSI
Electrical Supply	Uninterrupted AC
Existing Plumbing	Free of any deposits or built-ups inside pipes
Softener Location	Locate close to drain and connect according to plumbing codes
Bypass Valves	Always provide for bypass valve if unit is not equipped with one

CAUTION

- **Do not exceed 120 psi water pressure.**
- **Do not exceed 110°F water temperature.**
- **Do not subject unit to freezing conditions.**

1. Locate the softener tank and brine tank close to a drain where the system will be installed. The surface should be clean and level.
2. Perform all plumbing according to local plumbing codes.
 - Use a 1/2" minimum pipe or tubing size for the drain line.
 - Use a 3/4" pipe or tubing for backwash flow rates that exceed 7 gpm or length that exceeds 20ft (6m).
3. Only use Teflon tape on the drain fitting. Any solder joints near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the valve and joints when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.
4. Cut the 1" central pipe flush with top of each tank.
5. Lubricate the o-ring on the bottom of valve that seals against the tank. Screw the valve on to the tank. Be careful to not cross thread the valve into the tank. Only use silicone lubricant.
6. Add water until there is approximately 1" (25mm) of water above the grid plate. If the tank does not have a grid, add water until it is above the air check in the brine tank. Do not add salt to the brine tank at this time.
7. If the unit has a bypass valve, place it in the bypass position.
8. Slowly turn on the main water supply.
9. Open a cold soft water tap nearby and let water run a few minutes or until the system is free of foreign material resulting from the plumbing work. Close the water tap when water runs clean.
10. Place the bypass in the service position and let water flow into the mineral tank. When water flow stops, slowly open a cold water tap nearby and let water run until air is purged from the unit. Then close tap.

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Trouble Shooting

Issue	Possible Cause	Possible Solution
A. Unit fails to initiate a regeneration cycle.	1. No power supply.	Check electrical service, fuse, etc.
	2. Power failure	Reset time of day.
B. Water is hard.	1. By-pass valve open.	Close by-pass valve.
	2. Out of salt.	Add salt to tank.
	3. Plugged injector / screen	Clean parts.
	4. Flow of water blocked to brine tank.	Check brine tank refill rate.
	5. Hard water in hot water tank.	Repeat flushing of hot water tank required.
	6. Leak between valve and central tube.	Check if central tube is cracked or o-ring is damaged. Replace faulty parts.
	7. Internal valve leak.	Replace valve seals, spacer, and piston assembly.
C. Salt use is high.	1. Refill time is too long.	Check refill time setting.
D. Low water pressure.	1. Iron or scale builds up in line feeding unit.	Clean pipes.
	2. Iron build up inside valve or tank.	Clean control and add resin cleaner to clean bed. Increase regeneration frequency.
	3. Inlet of control plugged due to foreign material.	Remove piston and clean control valve.
E. Resin in drain line.	1. Air in water system.	Check well system for proper air eliminator control.
	2. Incorrect drain line flow control (DLFC) button.	Check for proper flow rate.
F. Too much water in brine tank.	1. Plugged injector or screen.	Clean parts.
	2. Foreign material in brine tank.	Clean parts.
G. Unit fails to draw brine.	1. Drain line flow control is plugged.	Clean parts.
	2. Injector or screen is plugged.	Clean parts.
	3. Inlet pressure too low.	Increase pressure to 25 PSI.
	4. Internal valve leak.	Replace seals, spacers, and piston assembly
H. Valve continuously cycles.	1. Broken gear.	Replace faulty parts.
I. Flow to drain continuously.	1. Valve settings incorrect.	Check valve settings.
	2. Foreign material in control valve.	Clean control.
	3. Internal leak.	Replace seals, spacers, and piston assembly.