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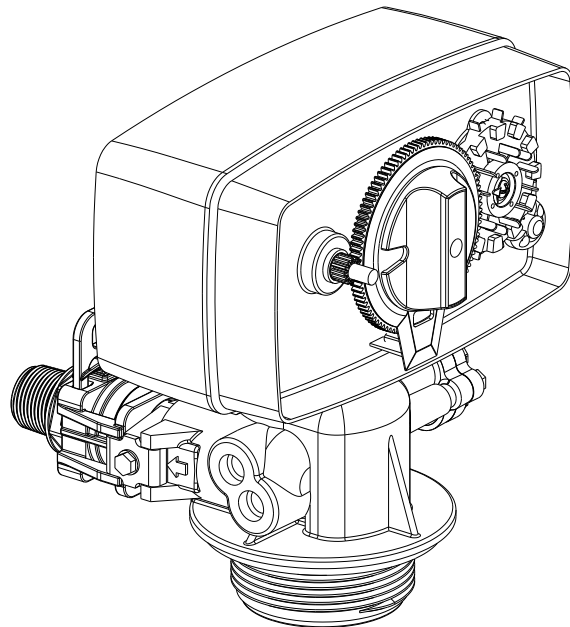
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# **BNT65 Series Valve Operation Manual**

## **Introduction**

This valve is controlled with a full-mechanical controller. The controller displays the current time. In addition, the controller also shows key valve information: remaining regeneration days.



BNT65 Series Outline

## **Main Functions**

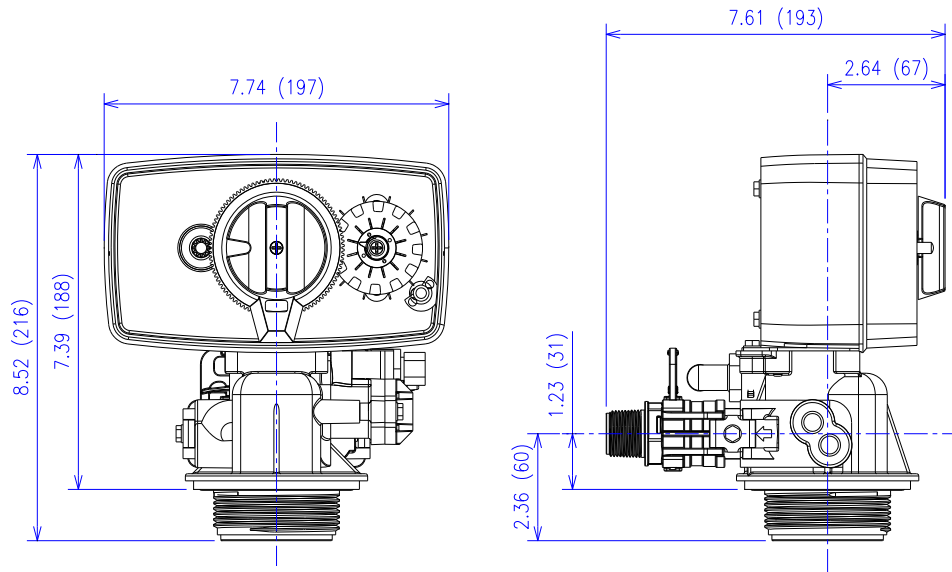
- Water Hardness can be adjusted:  
User can adjust the water hardness adjustment nut to get proper water hardness (optional for softener valve).
- Refill time can be adjusted
- Controller can display the current time just as a mechanical clock.
- Lower voltage (AC 12V) can be selected as the power of the valve.

## **Specifications**

- Hydrostatic Test Pressure .....350 psi (24.15 bar)
- Working Pressure.....20~125 psi (1.38~8.62 bar)
- Working Temperature.....1°C~39°C
- 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)

# BNT65 Series Valve Operation Manual

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BNT65 Series Dimensional Drawing (unit: inch, mm in brackets)

## Start-up Procedure

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1. Turn the knob and index the control into the Backwash position. Place the bypass in the **Service** position and let water flow into the mineral tank. Allow water to run to drain for 3-4 minutes or until all media fines are washed out of the softener or filter.

**NOTE:** Manually dial the various regeneration positions by turning the knob on the front of the control until the indicator shows that the softener is in the desired position. *For backwash filters ignore steps 3 to 5 and 7 to 9.*

2. Manually index the control back to the **Service** position and open a softened water tap until all air is released from the lines. Then close the tap.
3. Remove back cover plate.
4. Make sure that the salt dosage is set as recommended by the manufacturer. If necessary, set salt according to the setting instruction sheet. Manually index the control to the **Brine Fill** position and allow the brine tank to fill to the top of the air check.
5. Manually index the control to the **Brine Fill** position and allow the control to draw water from the brine tank until it stops.
6. Plug in the electrical cord and look in the sight hole in the back of the motor to see that it is running.
7. To set time of day press red time set button and turn 24-hour gear until present time of day is at "time of day."
8. **Timer Settings (Filter or Softener)**  
Set the regeneration days is to occur by sliding tabs on skipper wheel outward to expose trip fingers.  
Each tab is one day.

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Finger at red pointer is tonight.

Moving clockwise from red pointer, extend or retract fingers to obtain the desired regeneration schedule.

The next table can be used to determine the regeneration frequency.

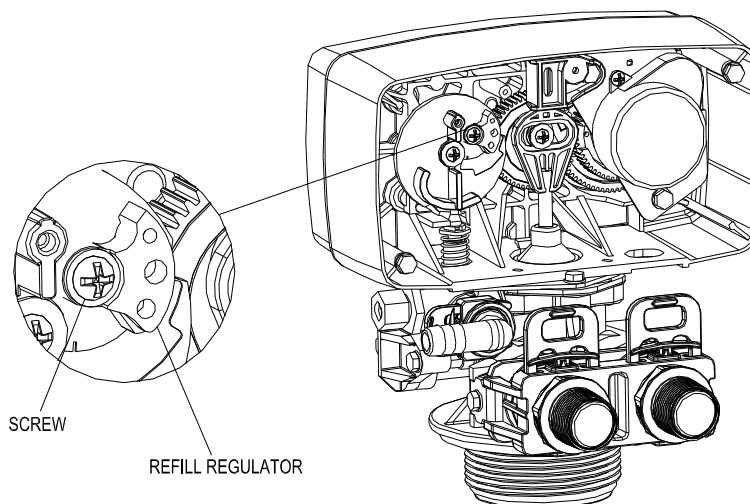
Sand Filters	Sediment Turbidity	Mild					Average					Extreme					
Activated Carbon Filters	Taste Odor	Mild					Average					Extreme					
Iron Filters	PPM Iron X1 PPM Manganese X2 PPM Sulphur X3	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	8	8.5
Softeners	Grains of Hardness	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80
	No. Of Persons	Calendar Clock Regenerations Frequency - No. Of Tabs Pushed Outwards															
	2	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3
	3	1	1	2	2	3	3	3	3	3	4	4	4	4	4	4	4
	4	1	2	2	2	3	3	3	4	4	4	6	6	6	6	6	6
	5	2	2	3	3	4	4	4	4	6	6	6	6	12	12	12	12
	6	2	2	3	3	4	4	4	6	6	6	6	6	12	12	12	12
	7	2	3	3	4	4	6	6	6	12	12	12	12	12	12	12	12
	8	2	3	3	4	6	6	6	6	12	12	12	12	12	12	12	12
	9	3	3	4	4	6	6	12	12	12	12	12	12	12	12	12	12
	10	3	4	4	6	6	12	12	12	12	12	12	12	12	12	12	12

**Regeneration Reference Chart**

9. Manually advance the control to the beginning of the **Brine Fill** position and allow the control to return to the **Service** position automatically.
10. Fill the brine tank with salt.
11. Place back cover on the control.
12. Make sure that any bypass valve is turned to the **Service** position.

## **Refill Volume Adjustment**

Refill volume can be adjusted through Refill Regulator (see the following picture). To adjust Refill volume, release the screw at first, and then turn the Refill Regulator to desired volume according to the Meter Label of Brine Gear, finally tighten the screw.



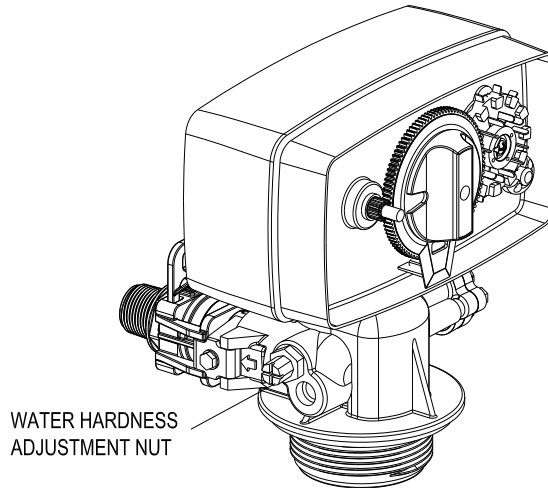
# **BNT65 Series Valve Operation Manual**

## **Water Hardness Adjustment (Optional for Softener Valve)**

Users can adjust the Water Hardness Adjustment Nut to get their required 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**

### **1. Inlet/Outlet Screw Standards:**

**Table I**

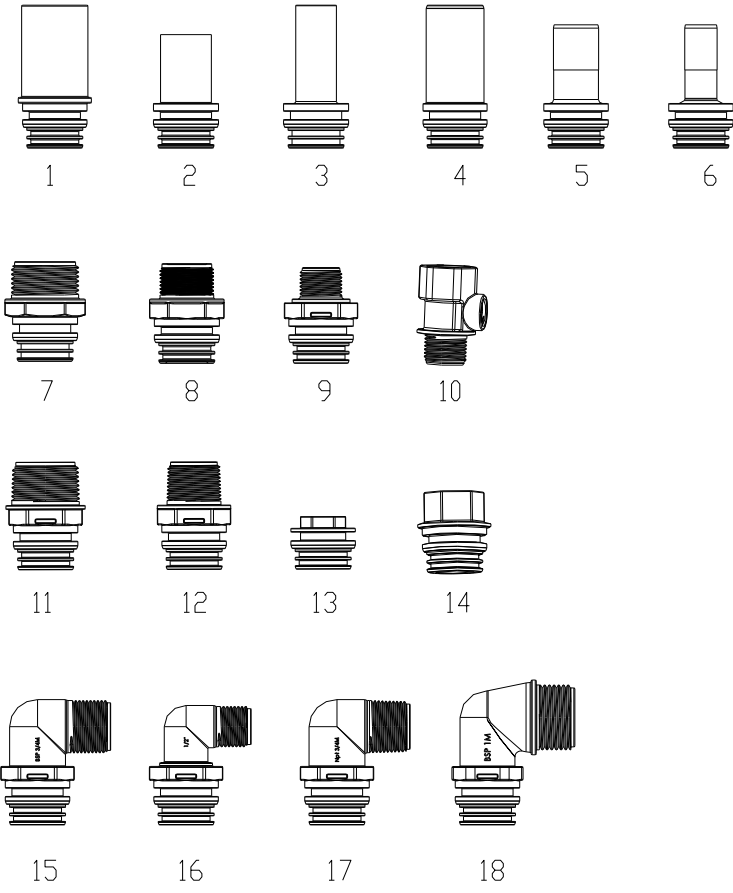
BSP Screw		NPT Screw	
Straight	90° Elbow	Straight	90° Elbow
1/2"、 3/4"、 1"	1/2"、 3/4"、 1"	3/4"、1"	3/4"

### **2 . Inlet/Outlet Screw Adaptor (Optional):**

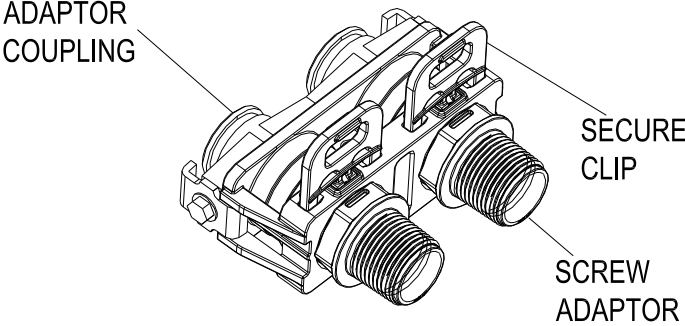
No.	Name	No.	Name
1	PPR Adaptor 1'	10	Nylon tri-pieces 4F×2F×4M
2	PPR Adaptor 3/4	11	Adaptor III Connect Screw NPT1M
3	PPR Adaptor 1/2	12	Adaptor III Connect Screw NPT6M
4	Adaptor (American standard 1' black)	13	Adaptor III Universal plug
5	Adaptor (American standard 6 " )	14	Adaptor III Connect screw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

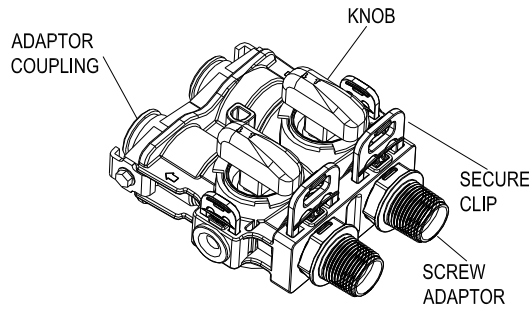


**3 . Inlet/Outlet Connections Types:**



STANDARD CONNECTION ASSEMBLY

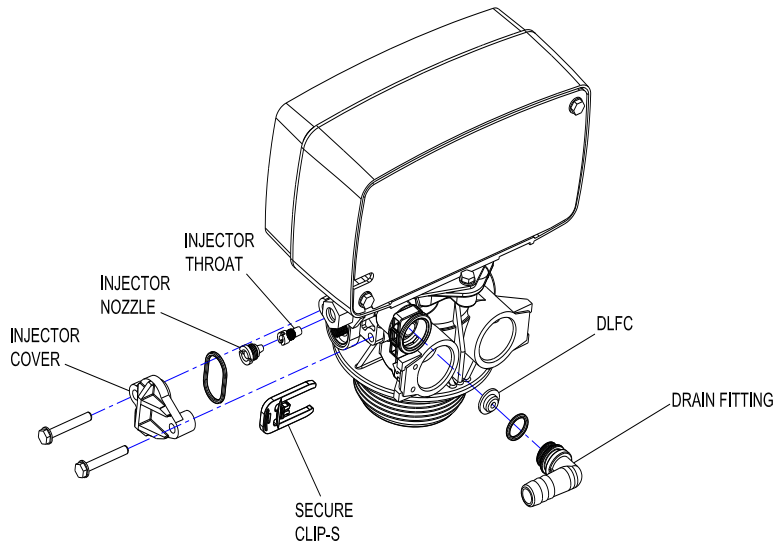
# BNT65 Series Valve Operation Manual



BYPASS ASSEMBLY

## 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#	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
2	0735	30040079	Gray	000#	05056185	1#	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
3	0815	30040079	Gray	000#	05056186	2#	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
4	0817	30040079	Gray	000#	05056186	2#	05056206	0.2 GPM
		30040080					05056076	0.3 GPM
5	0835	30040081	Purple	00#	05056186	2#	05056206	0.2 GPM
		30040082					05056076	0.3 GPM

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6	0844	30040081 30040082	Purple	00#	05056186	2# 2.0GPM	05056206 05056076	0.2 GPM 0.3 GPM
7	0935	30040083 30040084	Red	0#	05056186	2# 2.0GPM	05056206 05056076	0.2 GPM 0.3 GPM
8	1015	30040079 30040080	Gray	000#	05056187	3# 2.4GPM	05056206 05056076	0.2 GPM 0.3 GPM
9	1017	30040079 30040080	Gray	000#	05056187	3# 2.4GPM	05056206 05056076	0.2 GPM 0.3 GPM
10	1026	30040085 30040086	White	1#	05056187	3# 2.4GPM	05056206 05056076 05056178	0.2 GPM 0.3 GPM 0.7 GPM
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

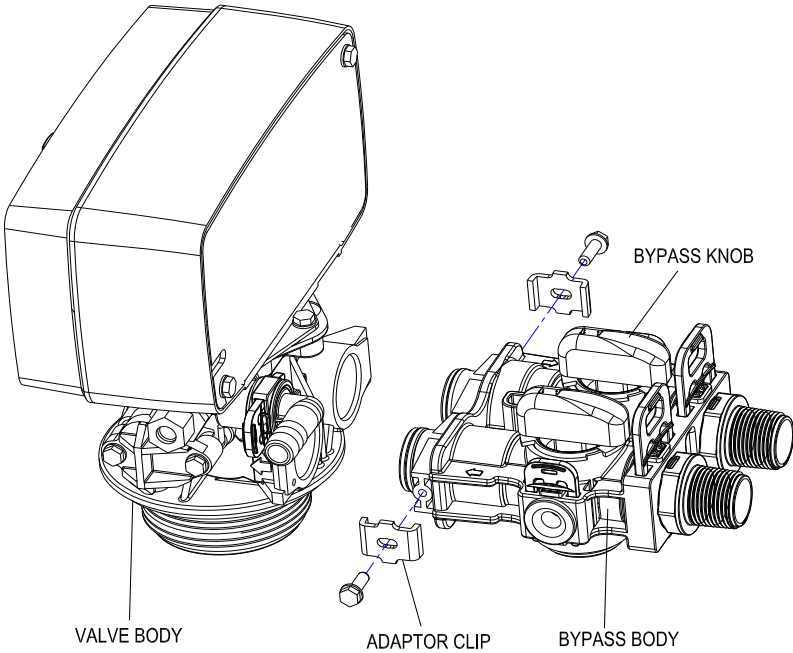
For reference only: Different Size DLFC is available for different **Filter** tanks as follows

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

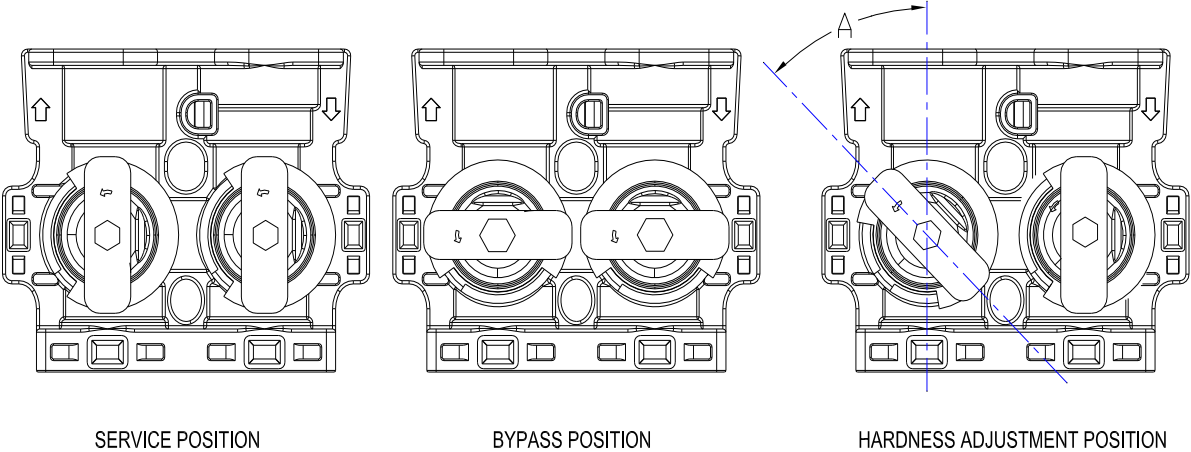


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## 5. Bypass Assembly

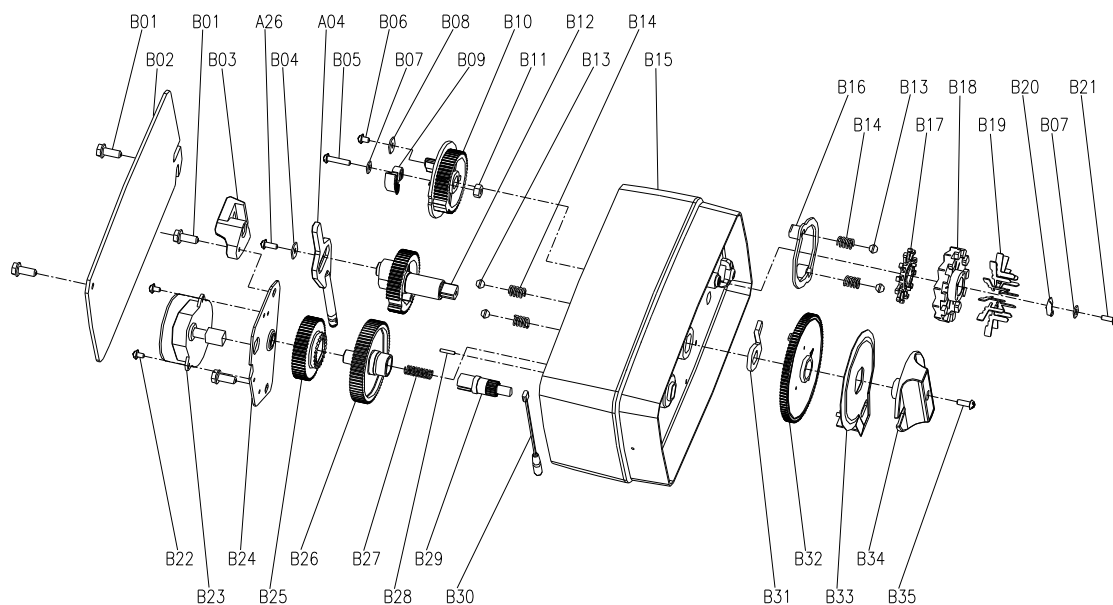


Bypass valve is provided with many functions such as bypass, water hardness adjustment. Different angles of bypass knob have different functions (see the following picture). The bigger angle (value A), the higher water hardness in hardness adjustment position.



# BNT65 Series Valve Operation Manual

## Valve Powerhead Assembly



Bnt65 Powerhead Assembly

### Bnt65 Powerhead Assembly Parts List

Item No.	Part No.	Part Description	Quantity
B01	05056136	Screw-ST3.5x13(Hexagon with Washer)	4
B02	05056014	Bnt65 Back Cover	1
B03	05010045	Piston Stem Holder	1
A26	13000426	Screw-ST2.9x13(Large Wafer)	1
B04	05056139	Washer-3x13	1
A04	05010081	Bnt65 Piston Rod	1
B06	05056083	Screw-M4x14	1
B05	05056166	Screw-ST4.2x12(Large Wafer)	1
B07	13111004	Washer-4x9	2
B08	05056141	Washer-4x12	1
B09	05056016	Refill Regulator	1
B10	05056015	Brine Gear	1
	05056061	Meter Label	1
B11	05056089	Nut-M4	1
B12	05056005	Main Gear	1
B13	05056092	Ball-1/4inch	4
B14	05056095	Spring Detent	4

## BNT65 Series Valve Operation Manual

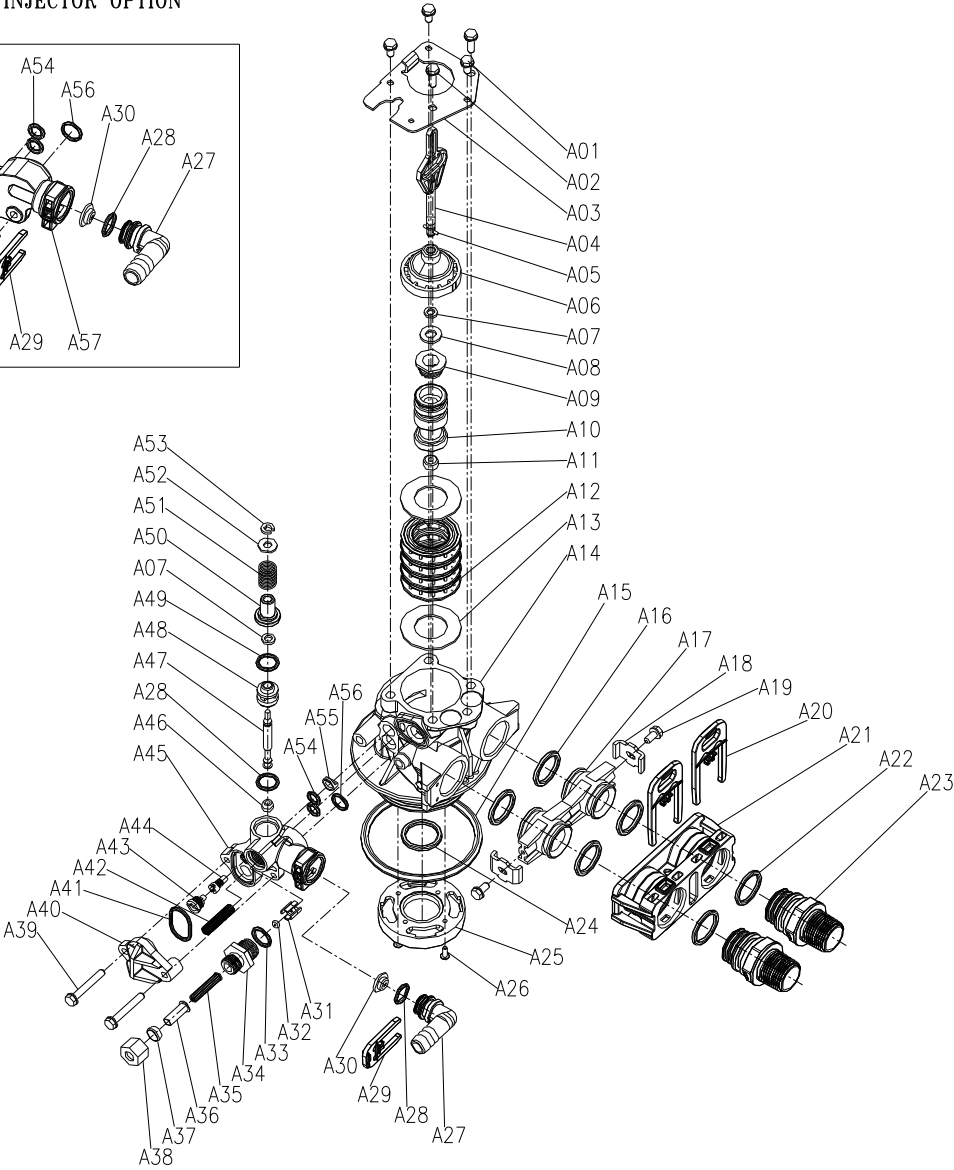
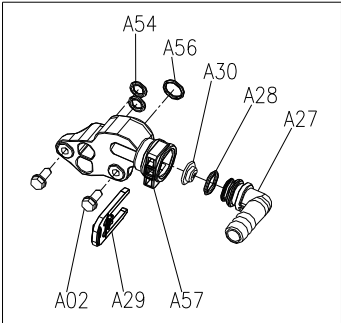
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B15	05056001	Bnt65 Housing	1
	05056057	Ring Label	1
	05056056	Bnt65 Label	1
B16	05056011	Skipper Wheel Ring	1
B17	05056010	Skipper Retainer	1
B18	05056009	Skipper Wheel	1
B19	05056048	Skipper	12
B20	05056012	Reneneration Pointer	1
B21	05010037	Screw-ST2.9x10	1
B22	05056082	Screw-M3x5	2
B23	05056049	Motor(12V3W)	1
	11700005	Wire Connector	2
B24	05056045	Motor Mounting Plate	1
B25	05056004	Driven Gear	1
B26	05056002	Idler Gear	1
B27	05056094	Spring Idler	1
B28	05056098	Motor Pin	1
B29	05056003	Idler Pinion	1
B30	05010029	Power Cable	1
	05056013	Bnt65 Power Strain Relief	1
B31	05056007	Cycle Actuator Gear	1
B32	05056006	Timer Gear	1
	05056059	Timer Gear Label	1
B33	05056017	Reneneration Pointer Plate	1
B34	05056008	Bnt65 Knob	1
	05056111	Bnt65 Knob Label	1
B35	05056084	Screw-ST3.5x13	5

# BNT65 Series Valve Operation Manual

## Valve Body Assembly

FILTER INJECTOR OPTION



# BNT65 Series Valve Operation Manual

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## Bnt65 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	05056181	Piston (Electrical)	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	05056090	Screw-ST4.2×13(Hexagon with Washer)	2
A20	21709003	Secure Clip	2
A21	05056140	Valve Connector	1
A22	05056065	O-ring-φ23.6×2.65	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

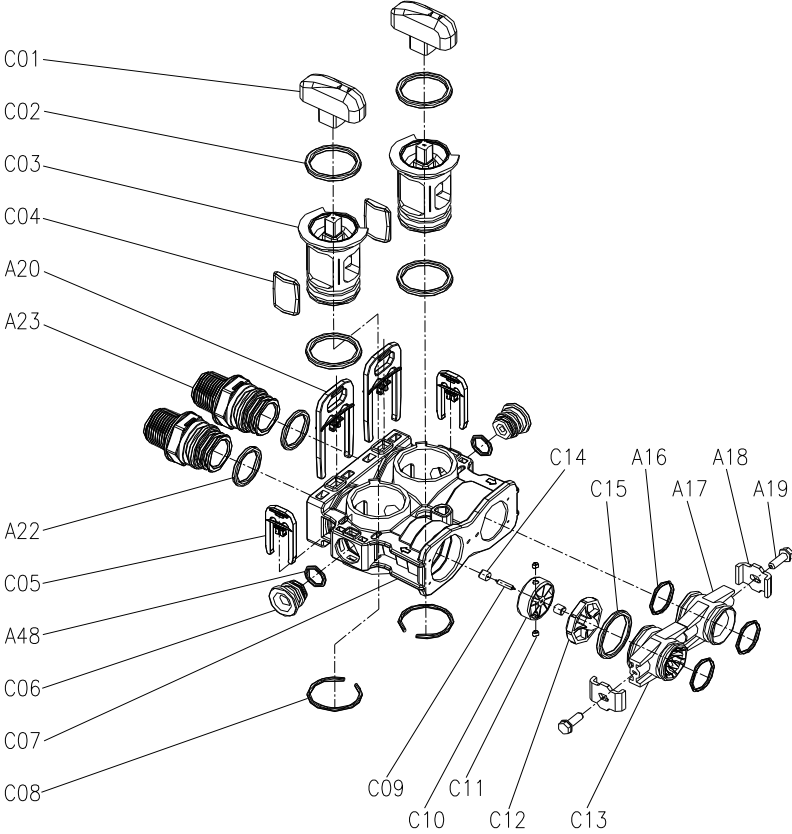
## BNT65 Series Valve Operation Manual

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A41	05056072	O-Ring-φ24×2	1
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-φ12.5×1.8	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-φ7.8×1.9)	2
A55	05056037	Air Disperser	1
A56	05056066	O-Ring-φ11×2	1
A57	05056165	Injector Body (Filter)	1

# BNT65 Series Valve Operation Manual

## Bypass Assembly



# **BNT65 Series Valve Operation Manual**

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## **Bypass Assembly Parts List**

<b>Item No.</b>	<b>Part No.</b>	<b>Part Description</b>	<b>Quantity</b>
C01	05056147	Bypass Knob	2
C02	26010028	O-Ring- $\phi$ 28 $\times$ 2.65	4
C03	05056148	Bypass Plug	2
C04	05056149	Bypass Seal	2
A20	21709003	Secure Clip	2
A23	21319006	Screw Adaptor	2
A22	05056065	O-Ring- $\phi$ 23.6 $\times$ 2.65	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	05056090	Screw-ST4.2 $\times$ 13(Hexagon with Washer)	2



# **BNT65 Series Valve Operation Manual**

## **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.

# **BNT65 Series Valve Operation Manual**

## **Trouble Shooting**

<b>Issue</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
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 usage is high.	1. Refill time is too high.	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 valve.
	3. Internal leak.	Replace seals, spacers, and piston assembly.