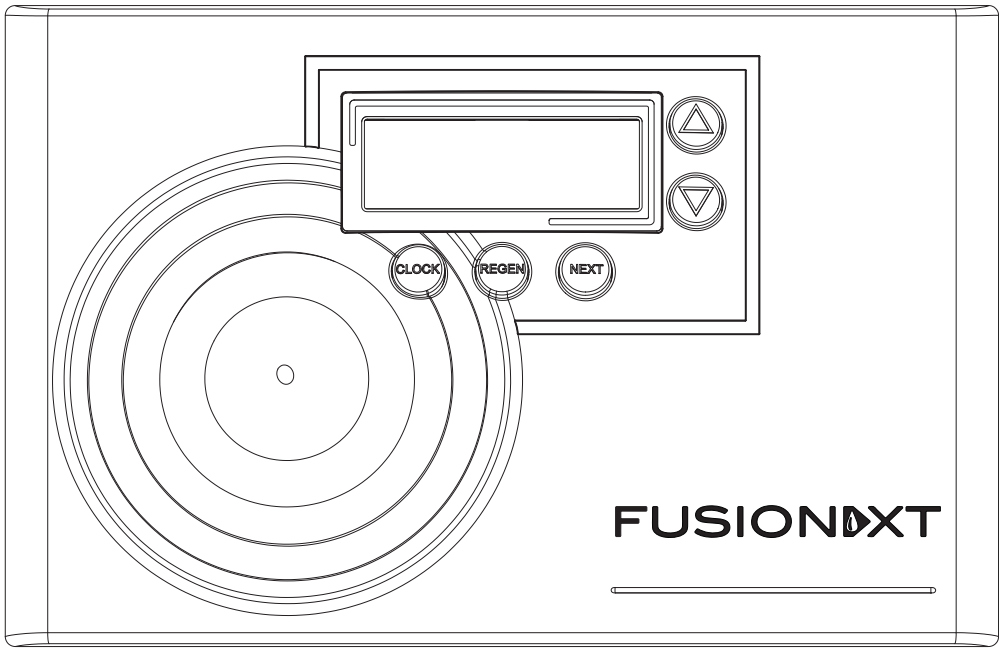
NUGEN Pure Water Systems
Fusion XT

Installation Instructions and Owners Manual

XT-48, XT-60, XT-70, XT-70ER, and XT-90



XT-32C

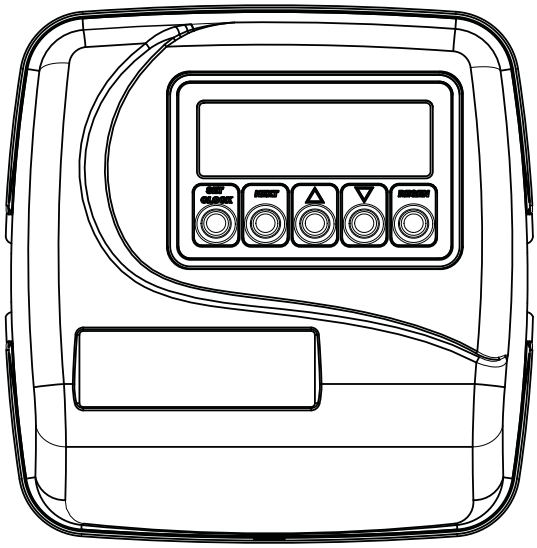


Table of Contents

Installed By:_____
Company Name: _____
Install Date: _____
Serial #: _____
Model #: _____

Your Water Test:
Hardness _____ gpg
Iron _____ ppm
pH _____ number
Manganese _____ ppm
Sulphur _____ yes/no
Total Dissolved Solids (TDS) _____

Your Fusion XT water softener is a precision built, high quality product. This unit will deliver conditioned water for many years to come when installed and operated properly. Please study this manual carefully before installing. This manual should be kept for future reference. If you have questions regarding your water conditioner, contact your local dealer or NuGen Pure Water Systems at the following:

NuGen Pure Water Systems
28 South 1550 West
Lindon, UT 84042
Phone: (801) 785-7010
Fax: (801) 785-7044

Pre-Installation Instructions

The manufacturer has preset the water treatment unit's cycle times, salt dose, exchange capacity and the salt dose refill time.

The dealer should read this page and guide the installer through setting the Hardness, Days Override, and Time of Regeneration prior to installation.

For the installer the following settings should be used:

1. Program Installer Settings
    - Hardness (set to local conditions)
    - Day Override (factory set to 14)
    - Time of Regeneration (preset to 2:00AM)

2. Set Time of Day

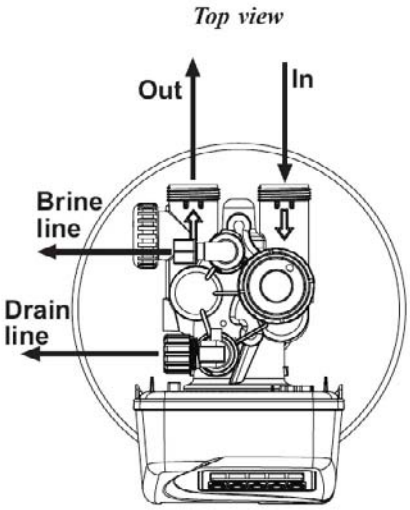
For the homeowner, please read user display settings.

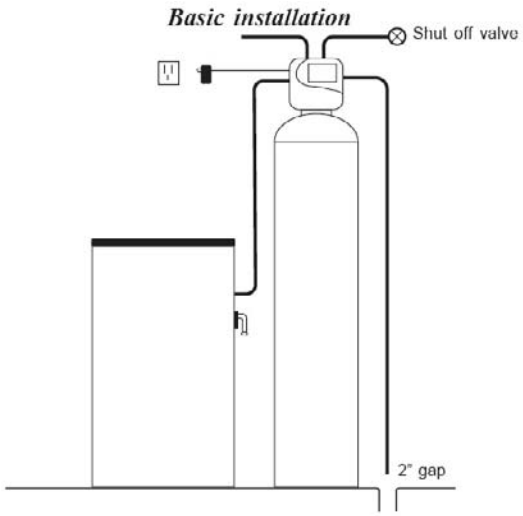
Water Softeners:
During operation, the normal user display is time of day or volume remaining. Other displays are available and can be viewed by pressing the NEXT button to scroll through them. When stepping through any programming, if no buttons are pressed within 5 minutes, the display returns to a normal user display. Any changes made prior to the 5 minute time out are incorporated.

To quickly exit any Programming, Installer Settings, etc., press the CLOCK button. Any changes made prior to the exit are incorporated. If desired, two regenerations within 24 hours are possible with a return to the preset program. To do a double regeneration:
1. Press the REGEN button once. "REGEN TODAY" will flash on the display.
2. Press and hold the REGEN button for three seconds until the regeneration begins.

Once the control valve has completed the immediate regeneration it will do another one at the next scheduled regeneration time.

Installation





GENERAL INSTALLATION & SERVICE WARNINGS
The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicon lubricant may be used on black orings but is not necessary. **Avoid any type of lubricants, including silicone, on red or clear lip seals.**

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" NPT elbow or the ¼" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connections or caps because o-ring seals are used. The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic Service Wrench, CV-P-V3193-02. If necessary a pliers can be used to unscrew the nut or cap. **Do not use a pipe wrench** to tighten or loosen nuts or caps. **Do not place screwdriver in slots on caps and/or tap with a hammer.**

SITE REQUIREMENTS:
- Water pressure, 40-90 psi
- Water temperature, 40° - 100° F
- The tanks should be on a firm, level surface
- Electrical: Use a 115/120v, 60Hz uninterrupted outlet
- Current draw is 0.25 amperes
- A 15-foot power cord is furnished
- The plug-in transformer is for dry locations only
- Batteries are not used

1. The distance between the drain and the water conditioner should be as short as possible. All plumbing should be done in accordance with local plumbing codes.

2. Since salt must be periodically added to the brine tank, it should be located where it is easily accessible.

3. Do not install any water conditioner with less than 10 feet of piping between its outlet and the inlet of a water heater.

4. Do not locate unit where it or its connections (including the drain and overflow lines) will ever be subjected to room temperatures under 34° F.

5. The use of resin cleaners in an unvented enclosure is not recommended.

6. INLET/OUTLET PLUMBING: Connect to a supply line downstream of outdoor spigots. Install an inlet shutoff valve and plumb to the unit's bypass valve inlet located at the right rear as you face the unit. There are a variety of installation fittings available. They are listed under **Installation Fitting Assemblies**. When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring and o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting solder flux, primer, and solvent cement on any part of the o-rings, split rings, bypass valve or control valve. If the building's electrical system is grounded to the plumbing, install a copper grounding strap from the inlet to the outlet pipe. **Plumbing must be done in accordance with all applicable local codes.**

7. DRAIN LINE: First, be sure that the drain can handle the backwash rate of the system. Solder joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6" between the drain line flow control fitting and solder joints. Failure to do this could cause interior damage to the flow control. Install a ½" I.D. flexible plastic tube to the Drain Line Barb Assembly or discard the barbed fitting and use the ¾" NPT fitting for rigid pipe. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 7" loop at the discharge end of the line so that the bottom of the loop is level with the drain connection on the control valve. This will provide an adequate antisiphon trap. Where the drain empties into an overhead sewer line, a sink-type trap must be used. Run drain tube to its discharge point in accordance with plumbing codes. Pay special attention to codes for air gaps and anti-siphon devices. See page 5 for air gap diagram.

8. BRINE TANK CONNECTION: Install a **3/8"** O.D. polyethylene tube from the Refill Elbow to the Brine Valve in the brine tank.

9. OVERFLOW LINE CONNECTION:
AN OVERFLOW DRAIN LINE IS RECOMMENDED WHERE A BRINE OVERFLOW COULD DAMAGE FURNISHINGS OR THE BUILDING STRUCTURE.
Your softener may be equipped with a brine tank safety float which greatly reduces the chance of an accidental brine overflow. In the event of a malfunction, however, an OVERFLOW LINE CONNECTION will direct the "overflow" to the drain instead of spilling on the floor where it could cause considerable damage. This fitting should be on the side of the cabinet or the brine tank. Attach a length of ½" I.D. tubing (not supplied) to fitting and run to drain. Do not elevate overflow line higher than 3" below bottom of overflow fitting. Do not "tie" this tube into the drain line of the control valve. Overflow line must be a direct, separate line from overflow fitting to drain, sewer, or tub. Allow an air gap as per the drain line instructions. See page 5 for air gap diagram.

IMPORTANT: Never insert a drain line directly into a drain, sewer line, or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.

10. SERIAL NUMBER: Record the serial number on the installer's and customer's records.
Bypass Valve The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance.

Bypass Valve

The bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows service personal to work on a pressurized system while still providing untreated bypass water to the facility or residence. Its completely non-metallic, all plastic design allows for easy access and serviceability without the need for tools.

The bypass body and rotors are glass filled Noryl and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal o-rings can easily be replaced if service is required.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow shaped handles. The handles identify the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

1. **Normal Operation Position:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle. (See Figure 1)

2. **Bypass Position:** The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system. (See Figure 2)

3. **Diagnostic Position:** The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing. (See Figure 3)

4. **Shut Off Position:** The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system . If water is available on the outlet side of the softener it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system). (See Figure 4)

BYPASS VALVE OPERATION

Figure 1

NORMAL OPERATION

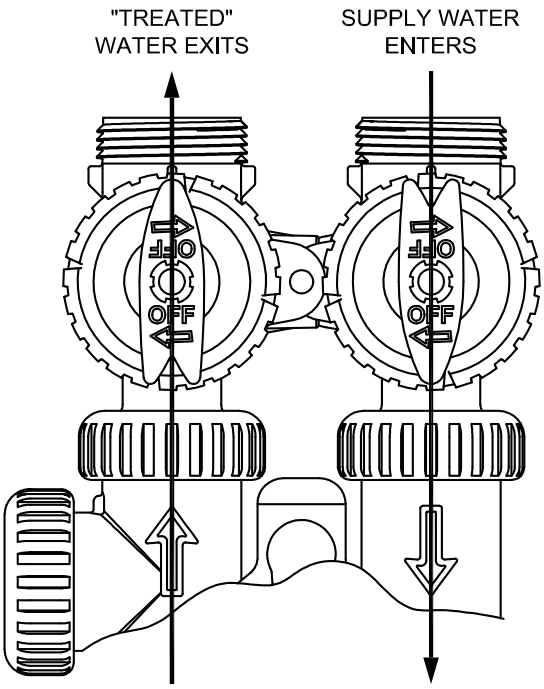


Figure 2

BYPASS OPERATION

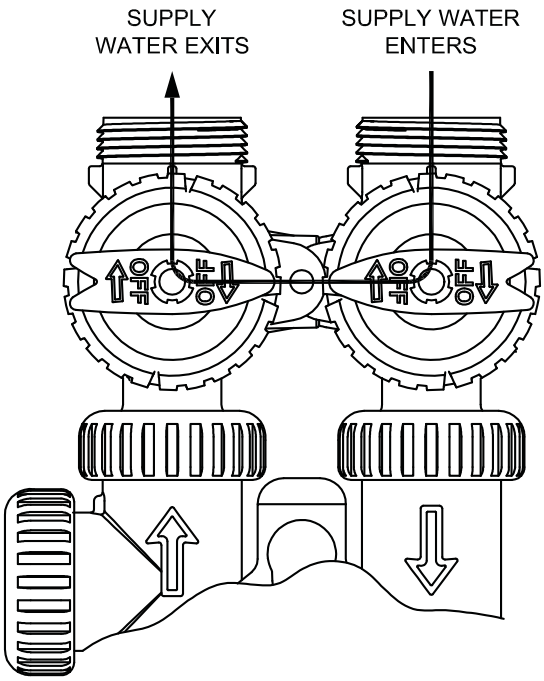


Figure 3

DIAGNOSTIC MODE

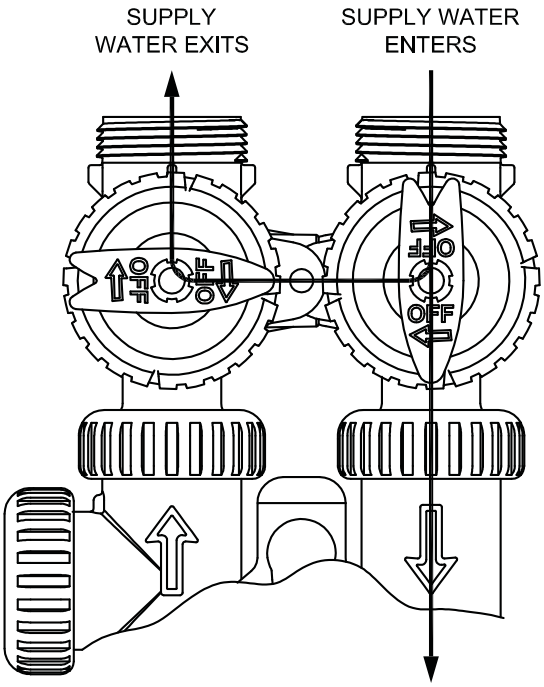
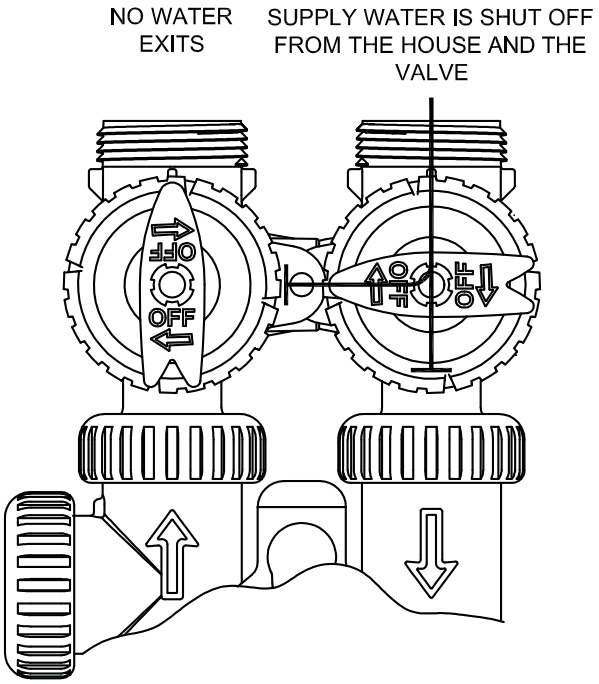


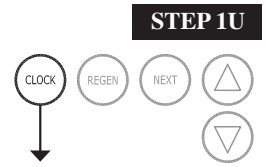
Figure 4

SHUT OFF MODE

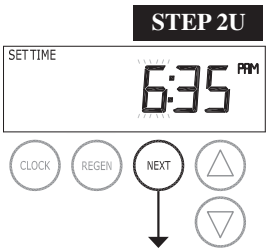


Program Installer Settings

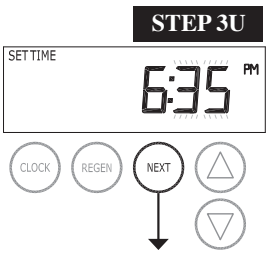
Set Time of Day for XT-48, XT-60, XT-70, XT-70ER, and XT-90



STEP 1U – Press CLOCK.



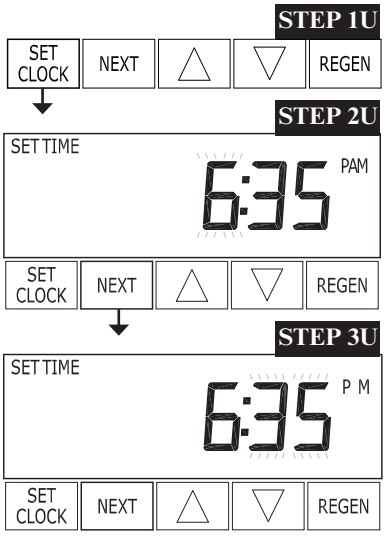
STEP 2U - Current Time (hour): Set the hour of the day using ▼ or ▲ buttons. AM/PM toggles after 12. Press NEXT to go to step 3U.



STEP 3U - Current Time (minutes): Set the minutes of the day using ▼ or ▲ buttons. Press NEXT to exit Set Clock. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

Set Time of Day for XT-32C



STEP 1U – Press SET CLOCK.

STEP 2U - Current Time (hour): Set the hour of the day using ▼ or ▲ buttons. AM/PM toggles after 12. Press NEXT to go to step 3U.

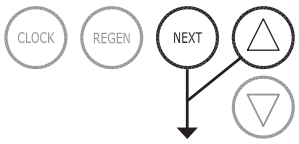
STEP 3U - Current Time (minutes): Set the minutes of the day using ▼ or ▲ buttons. Press NEXT to exit Set Clock. Press REGEN to return to previous step.

XT-48, XT-60, XT-70, XT-70ER, and XT-90 Program Installer Settings

Note: The manufacturer has preset the unit so that the gallons between regenerations will be automatically calculated after the hardness is entered.

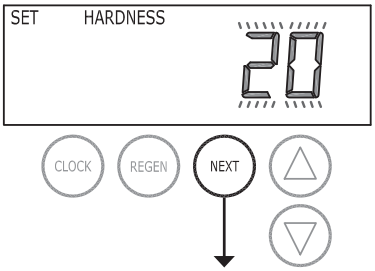
Installer Display Settings

STEP 1I



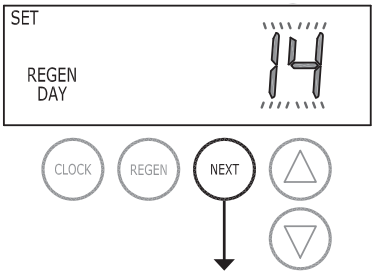
STEP 1I - Press NEXT and ▲ simultaneously for 3 seconds.

STEP 2I



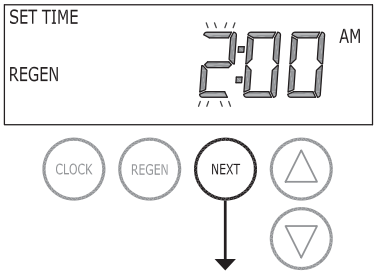
STEP 2I – Hardness: Set the amount of hardness in grains of hardness as calcium carbonate per gallon using the ▼ or ▲ buttons. The default is 20 with value ranges from 1 to 150 in 1 grain increments. Note: The grains per gallon can be increased if soluble iron needs to be reduced. This display will show "–nA–" the system is set up for a filter or if 'AUTO' is not selected. Press NEXT to go to step 3I. Press REGEN to exit Installer Display Settings.

STEP 3I



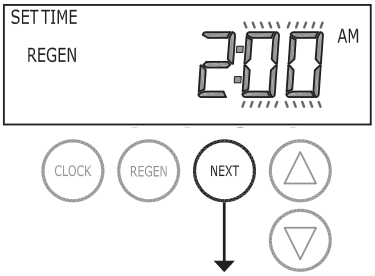
STEP 3I – Days Between Regeneration (Days Overide): The manufacturer has factory set 14 days as the default. This is the maximum number of days between regenerations. If this is set to "OFF" regeneration initiation is based on gallons used only. If any number is set (available range is from 1 to 28 days), regeneration will be called for on that day even if a sufficient number of gallons were still available. Set Day Override by using the ▲ or ▼ buttons.

STEP 4I



STEP 4I – Next Regeneration Time (hour): Set the hour of day for regeneration using ▼ or ▲ buttons. AM/PM toggles after 12. The default time is 2:00 a.m. Press REGEN to return to previous step.

STEP 5I

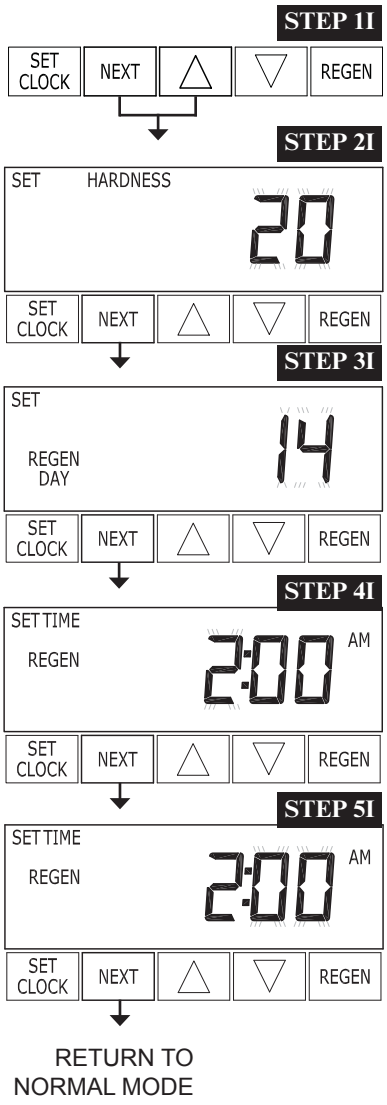


STEP 5I – Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▼ or ▲ buttons. Press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.

To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The control valve may be stepped through the various regeneration cycles by pressing the "REGEN" button.

RETURN TO
NORMAL MODE

XT-32C Program Installer



STEP 1I - Press NEXT and ▲ simultaneously for 3 seconds.

STEP 2I – Hardness: Set the amount of hardness in grains of hardness as calcium carbonate per gallon using the ▼ or ▲ buttons. The default is 20 with value ranges from 1 to 150 in 1 grain increments. Note: The grains per gallon can be increased if soluble iron needs to be reduced. This display will show "–nA–" if "FILTER" is selected in Step 2F or if 'AUTO' is not selected in Step 6S. Press NEXT to go to step 3I. Press REGEN to exit Installer Display Settings.

STEP 3I – Day Override: When gallon capacity is set to off, Day Override sets the number of days between regenerations. When gallon capacity is set to AUTO or to a number, Day Override sets the maximum number of days between regenerations. If value set to "oFF" regeneration initiation is based solely on gallons used. If value is set as a number (allowable range from 1 to 28) a regeneration initiation will be called for on that day even if sufficient number of gallons were not used to call for a regeneration. Set Day Override using ▼ or ▲ buttons:

- number of days between regeneration (1 to 28); or
- "oFF".

See Setting Options Table for more detail on setup. Press NEXT to go to step 4I. Press REGEN to return to previous step.

STEP 4I – Next Regeneration Time (hour): Set the hour of day for regeneration using ▼ or ▲ buttons. AM/PM toggles after 12. The default time is 2:00 a.m. This display will show "REGEN on 0 GAL" if "on 0" is selected in Step 9S or Step 7F. Press NEXT to go to step 5I. Press REGEN to return to previous step.

STEP 5I – Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▼ or ▲ buttons. This display will not be shown if "on 0" is selected in Step 9S or Step 7F. Press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.

To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The control valve may be stepped through the various regeneration cycles by pressing the "REGEN" button.

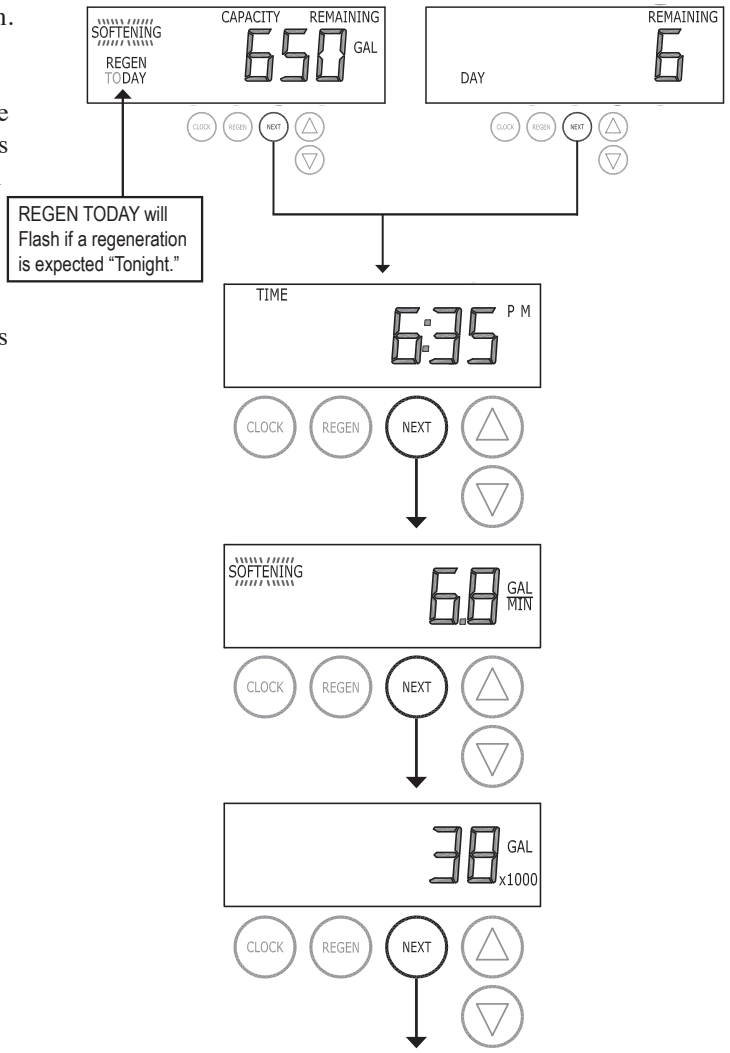
Operating Displays and Instructions

XT-48, XT-60, XT-70, XT-70ER, and XT-90

General Operation

When the system is operating, one of five displays may be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display is days remaining. Days remaining is the number of days left before the system goes through a regeneration cycle. The third display is Capacity Remaining. Capacity Remaining is the gallons that will be treated before the system goes through a regeneration cycle. The fourth display shows the current treated water flow rate through the system. The fifth display shows the total amount of treated water from 1x1000 to 9999x1000 gallons. This is resettable by simultaneously pressing the clock and regen buttons for 3 seconds. If the system has called for a regeneration that will occur at the preset time of regeneration, the words REGEN TODAY will appear on the display.

If a water meter is installed, the word "Softening" or "Filtering" flashes on the display when water is being treated (i.e. water is flowing through the system).



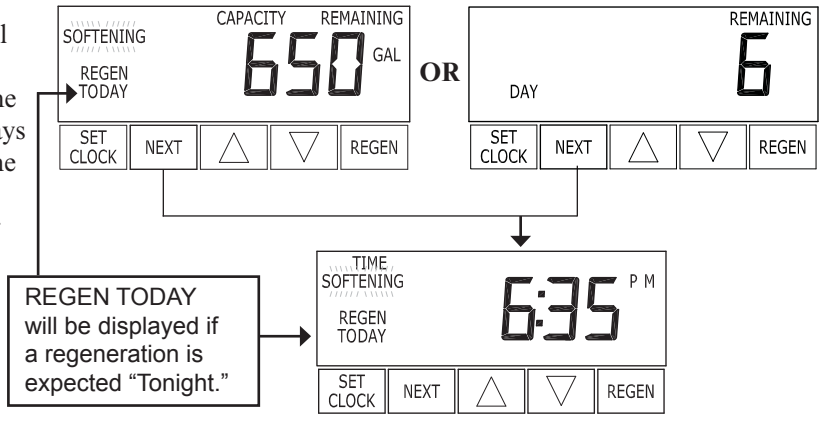
XT-32C

General Operation

When the system is operating one of two displays will be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display is one of the following: days remaining or gallons remaining. Days remaining is the number of days left before the system goes through a regeneration cycle. Capacity remaining is the number of gallons that will be treated before the system goes through a regeneration cycle. The user can scroll between the displays as desired.

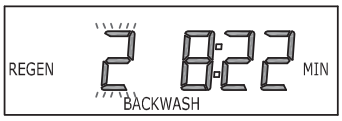
If the system has called for a regeneration that will occur at the preset time of regeneration, the words REGEN TODAY will appear on the display.

When water is being treated (i.e. water is flowing through the system) the word "Softening" or "Filtering" flashes on the display if a water meter is installed.



Regeneration Mode

Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.

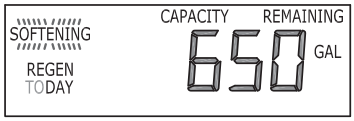


When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

Manual Regeneration

Sometimes there is a need to regenerate the system sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.

REGEN TODAY will Flash if a regeneration is expected "Tonight."



To initiate a manual regeneration at the preset delayed regeneration time, press and release "REGEN". The words "REGEN TODAY" will flash on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the "REGEN" button in error, pressing the button again will cancel the request.

To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The request cannot be cancelled.

Note: For softeners, if brine tank does not contain salt, fill with salt and wait at least two hours before regenerating.

Start-up Instructions

• After installation is completed and checked for leaks, rotate the bypass handles to the bypass position (see bypass valve diagram page).

• Fully open a cold water faucet.

• Allow water to run until clear to rid pipes of debris, which may have occurred during installation.

• The system is now ready for testing:

1. With the bypass valve in the bypass position, manually pour enough water into the brine tank to reach the top of the air check valve.

2. Press and hold the REGEN button for about three seconds until the drive motor starts. Wait until the motor stops and the display reads “Backwash.” The backwash time will begin to count down.

3. Open the inlet handle of the bypass valve very slightly allowing water to fill the tank slowly in order to expel air. CAUTION: If water flows too rapidly, there will be a loss of media out of the drain.

4. When the water is flowing steadily to the drain without the presence of air, press the REGEN button to advance the control to the brine position. The brine time will begin to count down.

5. Fully open the inlet bypass valve handle (bypass is now in the diagnostic position)
   Check to verify that water is being drawn from the brine tank
   There should be a slow flow to the drain
   Allow three minutes for the media bed to settle

6. Press the REGEN button again to advance the control to the next position and allow water to run to drain for 2-3 minutes. Control will transfer and the display will read "Backwash" or "Rinse" depending on the program used. If "Backwash" is displayed press the REGEN button to advance the control to the rinse position. Allow water to run to drain until clear.

7. Press the REGEN button to advance the control to where the display reads "Fill". This will allow water to run into the brine tank and prepare it for the next regeneration. Allow the brine tank to fill automatically.

8. While the brine tank is filling, load it with water softener salt.

9. SANITIZE! ON INITIAL STARTUP AND AFTER SERVICING THE VALVE. For each cubic foot of resin, add two ounces of 5.25% household chlorine bleach to the water in the brine tank brine well. Press and hold the REGEN button for about three seconds to begin regeneration. Allow the system to complete the regeneration automatically. The system will now be sanitized and producing soft water. Be sure to check for local codes, which may also specify sanitization methods.

Troubleshooting

Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped GFI	b. Reset breaker switch and/ or GFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration set incorrectly	c. Reset regeneration time
	d. Control valve set at “on 0” (immediate regeneration)	d. Check programming setting and reset to NORMAL (for a delayed regen time)
	e. Control valve set at “NORMAL + on 0” (delayed and/ or immediate)	e. Check programming setting and reset to NORMAL (for a delayed regen time)
5. Time of day flashes on and off	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
6. Control valve does not regenerate automatically when the REGEN button is depressed and held.	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective PC Board
7. Control valve does not regenerate automatically but **does** when the REGEN button is depressed and held.	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

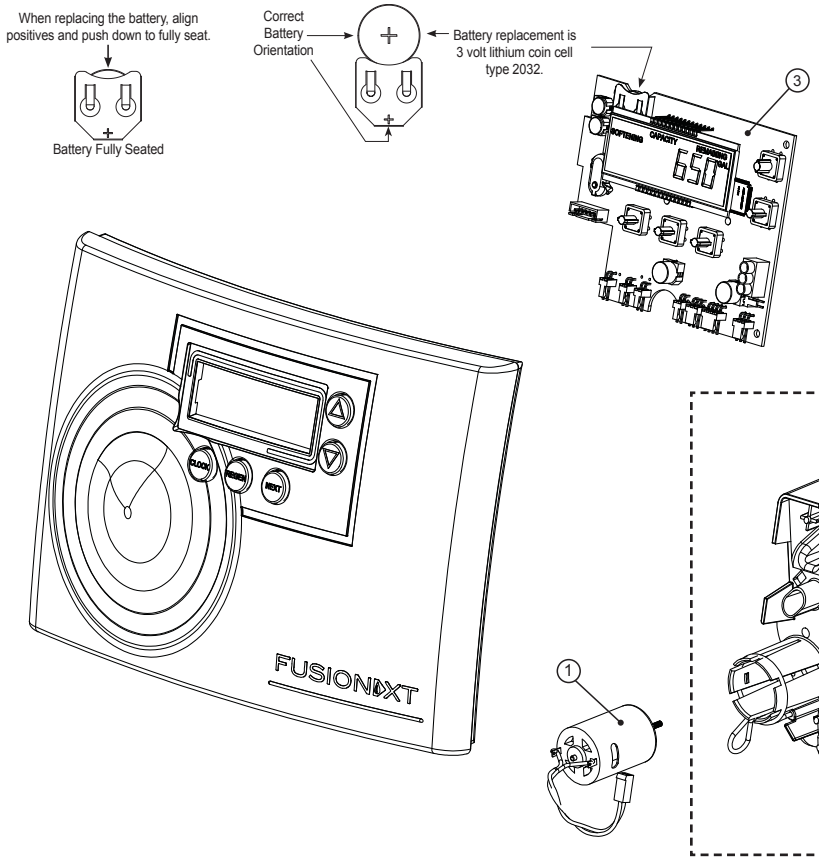
Problem	Possible Cause	Solution
8. Hard or untreated water is being delivered	a. Bypass valve is open or faulty	a. Fully close bypass valve or replace
	b. Media is exhausted due to high water usage	b. Check program settings or diagnostics for abnormal water usage
	c. Meter not registering	c. Remove meter and check for rotation or foreign material
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. No regenerant or low level of regenerant in regenerant tank	e. Add proper regenerant to tank
	f. Control fails to draw in regenerant	f. Refer to Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 25 psi

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. E1, Err – 1001, Err – 101 = Control unable to sense motor movement	a. Motor not inserted full to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Missing reduction gears	c. Replace missing gears
15. E2, Err – 1002, Err – 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out piston assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Problem	Possible Cause	Solution
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Fusion XT-48, XT-60, XT-70, XT-70ER and XT-90 Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3107-01	MOTOR	1
2	CV-P-V3106-02	DRIVE BRACKET ASSY	1
3	CV-P-V3377MR	FUSION PC BOARD	1
NOT SHOWN	CV-P-V3186	WS1 AC ADAPTER 120V-12V	1

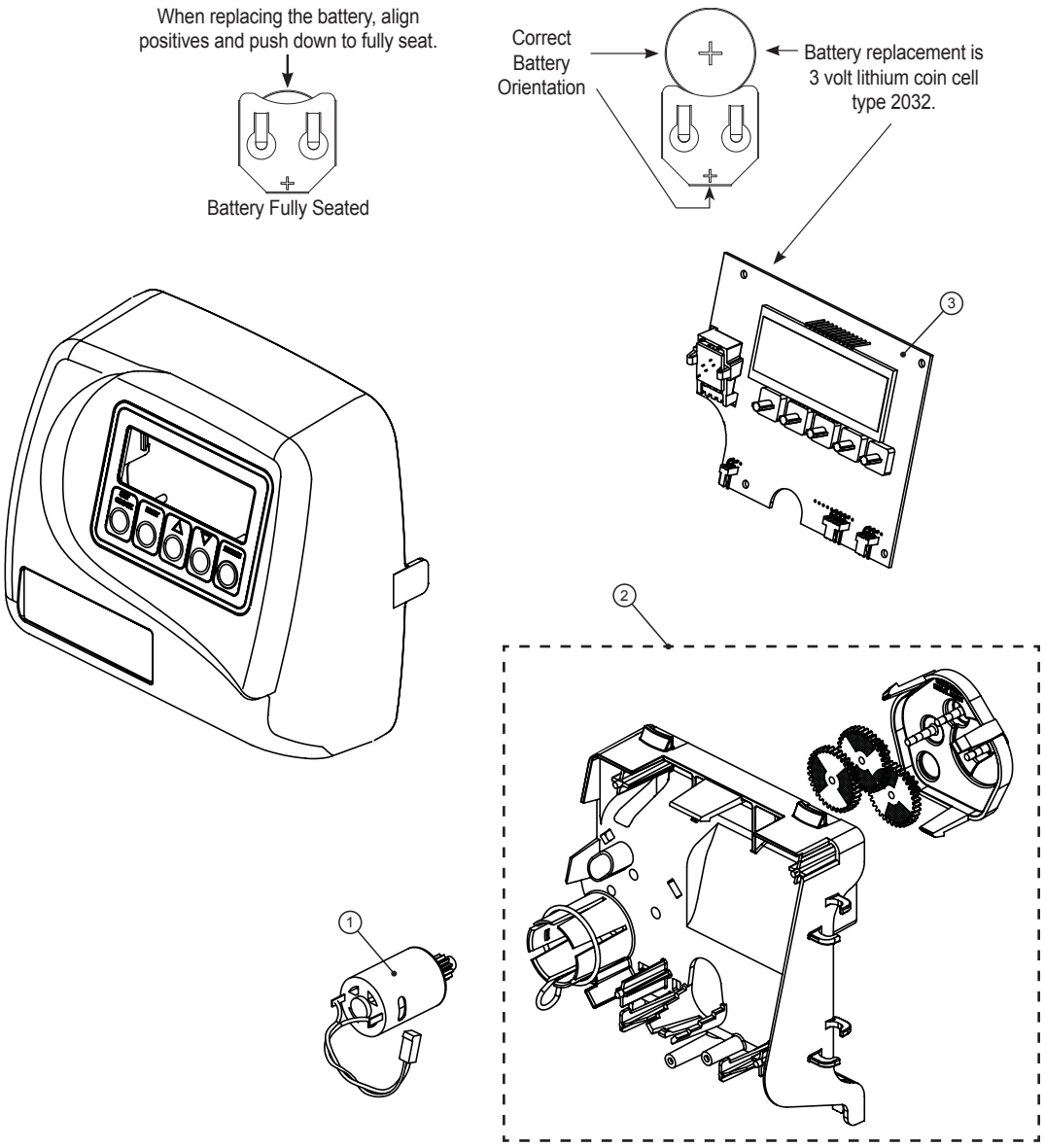


AC Adapter	U.S.
Supply Voltage	120 VAC
Supply Frequency	60Hz
Output Voltage	12 VAC
Output Current	500mA

XT-32C Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3107-01	MOTOR	1
2	CV-P-V3106-02	DRIVE BRACKET ASSY	1
3	CV-P-V3108	XT-32C	1
Not Shown	CV-P-V3186	AC ADAPTER 120V-12V	1

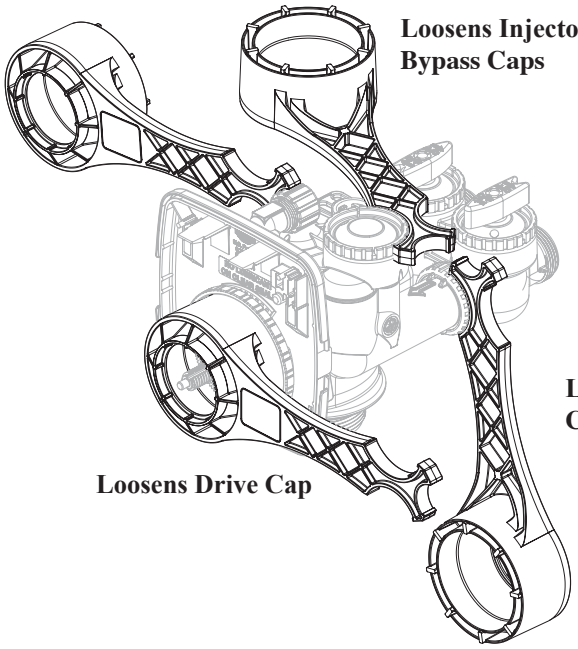
AC Adapter	U.S.
Supply Voltage	120 V AC
Supply Frequency	60 Hz
Output Voltage	12 V AC
Output Current	500 mA



Service Wrench - CV-P-V3193-02

Not provided with system. Separate purchase required. Bypass and depressurize system before using wrench.

Loosens Drain Nut in Polytube Applications



Loosens Injector And Bypass Caps

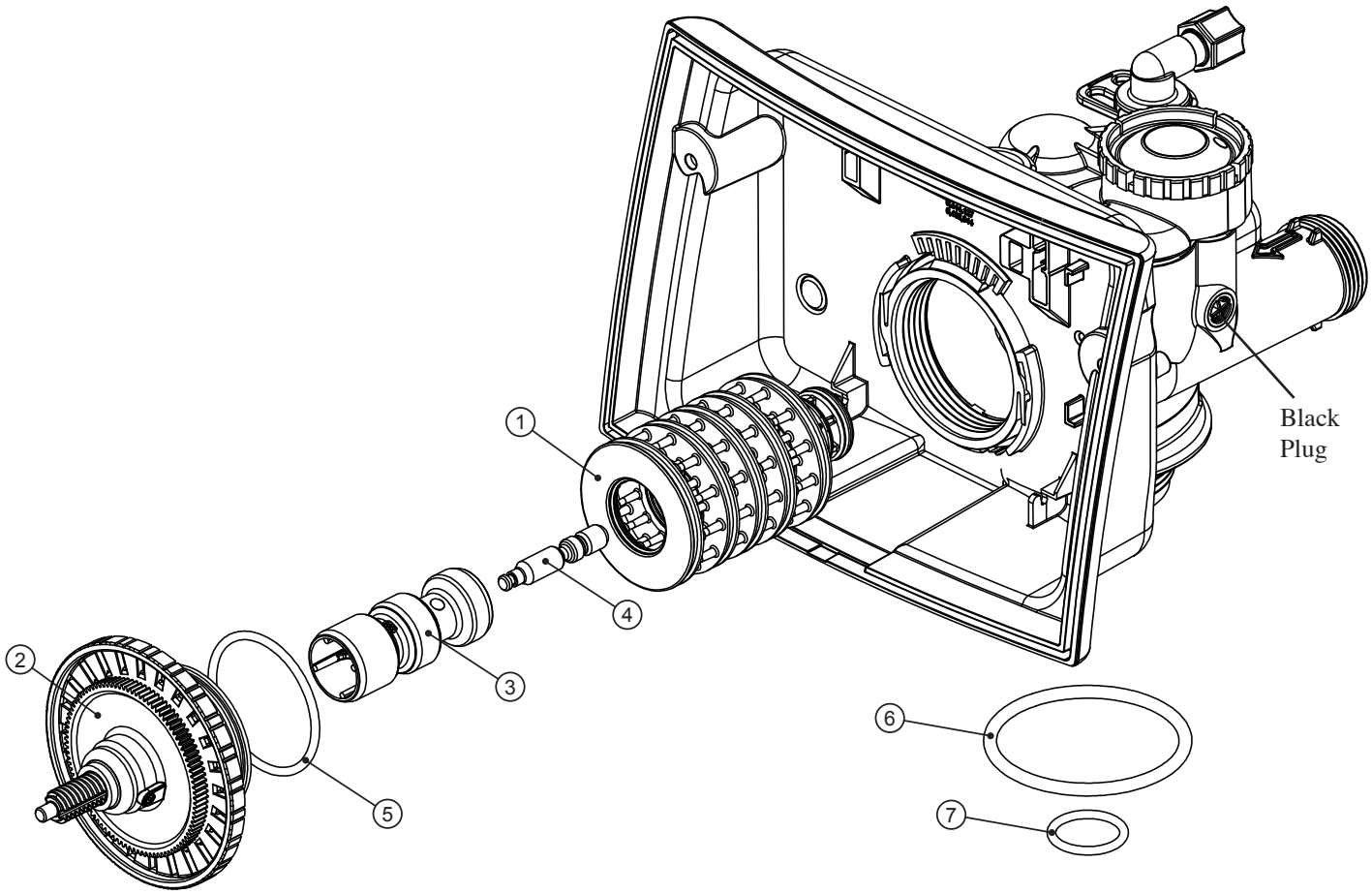
Although no tools are necessary to assemble or disassemble the valve, the Service Wrench, (shown in various positions on the valve) is available to aid in assembly or disassembly.

Loosens Quick Connect Nuts

Loosens Drive Cap

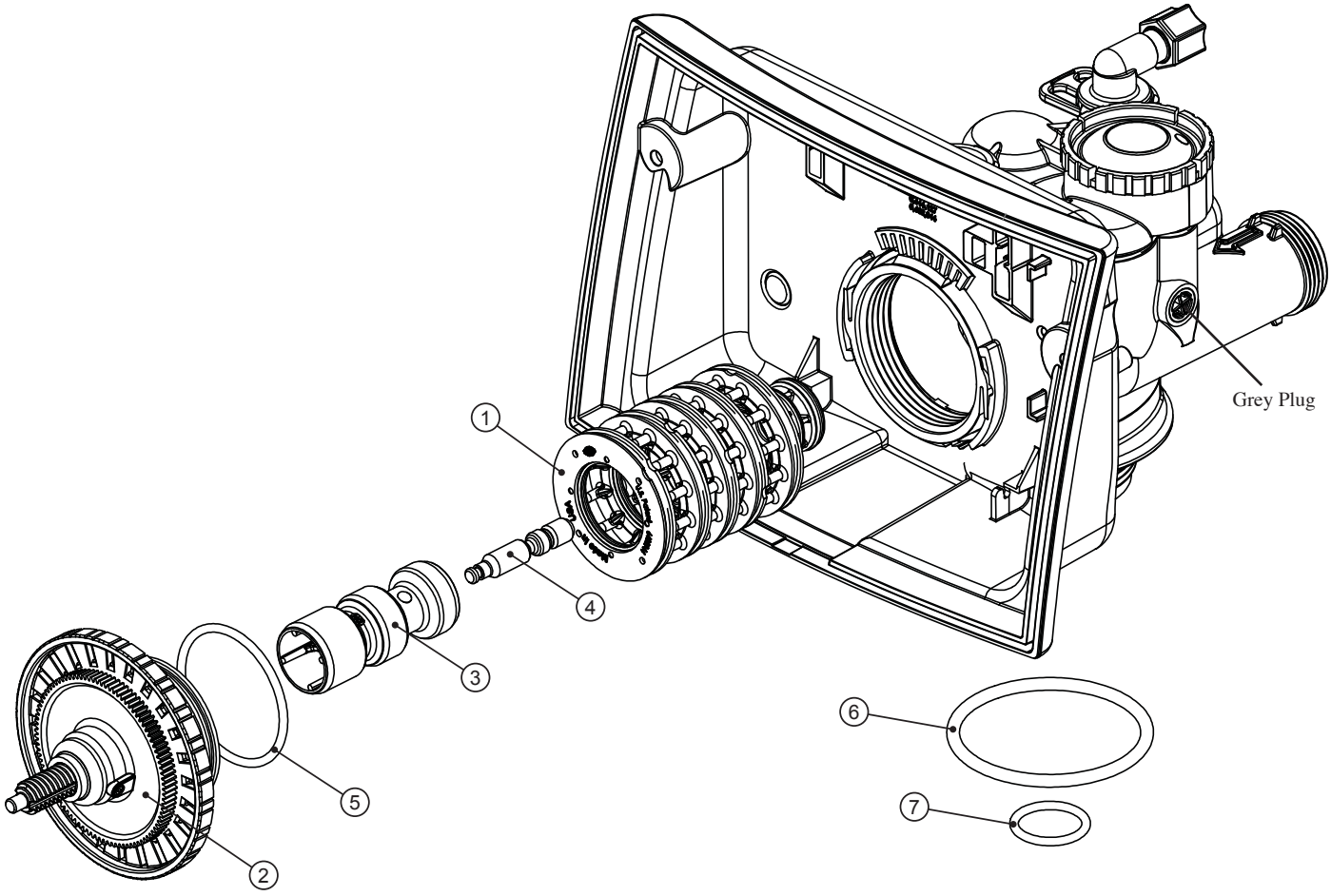
Fusion XT-48, XT-60, XT-70 and XT-70ER Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3005	Spacer Stack Assembly	1
2	CV-P-V3004	Drive Cap ASY	1
3	CV-P-V3011	Piston Downflow ASY	1
4	CV-P-V3174	Regenerant Piston	1
5	CV-P-V3135	O-ring 228	1
6	CV-P-V3180	O-ring 337	1
7	CV-P-V3105	O-ring 215 (Distributor Tube)	1



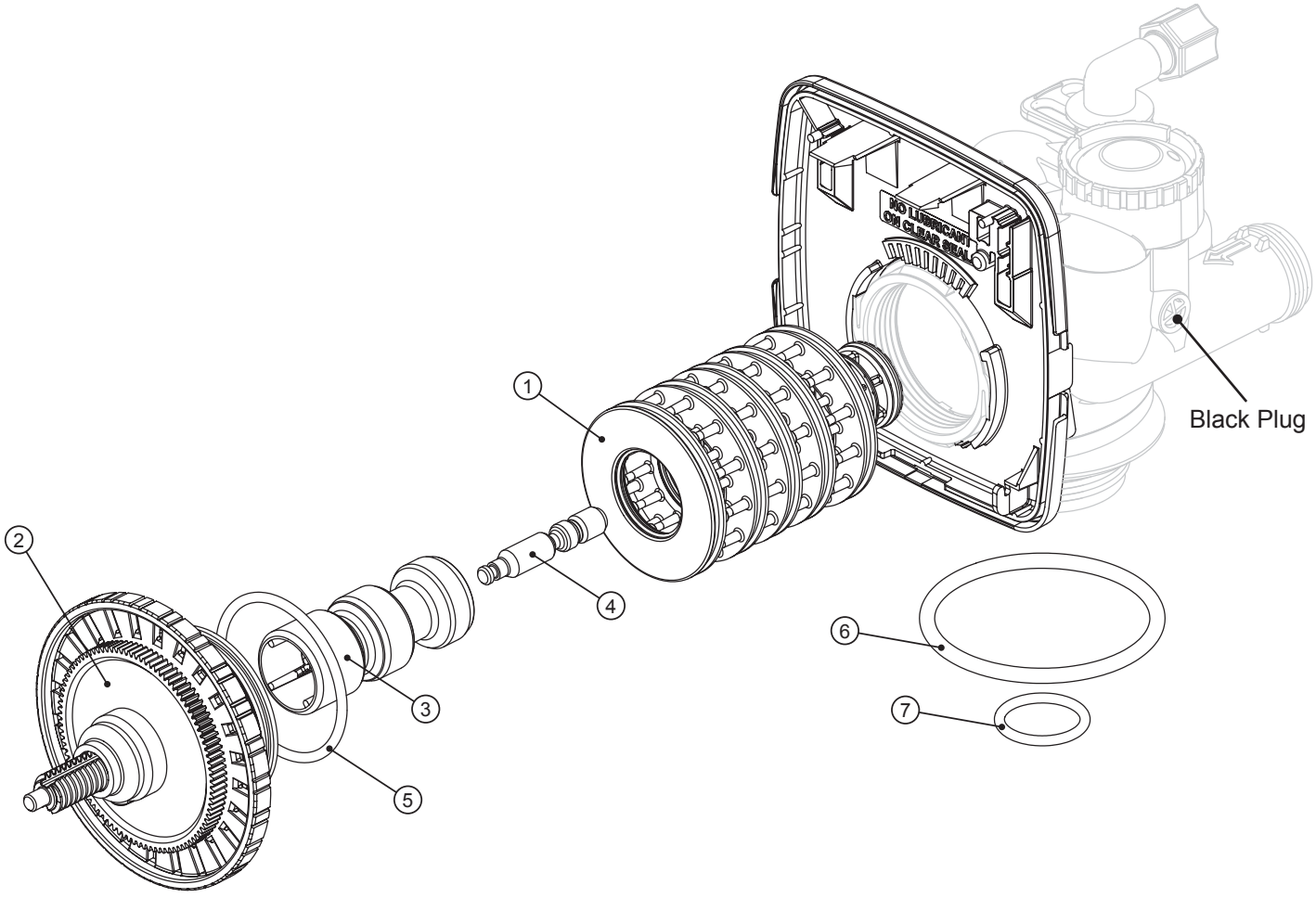
Fusion XT-90 Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3430	1.25 Spacer Stack Assembly	1
2	CV-P-V3004	Drive Cap ASY	1
3	CV-P-V3407	1.25 Piston Downflow ASY	1
4	CV-P-V3174	Regenerant Piston	1
5	CV-P-V3135	O-ring 228	1
6	CV-P-V3180	O-ring 337	1
7	CV-P-V3358	O-ring 219 (Distributor Tube Opening 1.32")	1



XT-32C Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3005	Spacer Stack Assembly	1
2	CV-P-V3004	Drive Cap ASY	1
3	CV-P-V3011	Piston Downflow ASY	1
4	CV-P-V3174	Regenerant Piston	1
5	CV-P-V3135	O-ring 228	1
6	CV-P-V3180	O-ring 337	1
7	CV-P-V3105	O-ring 215 (Distributor Tube)	1

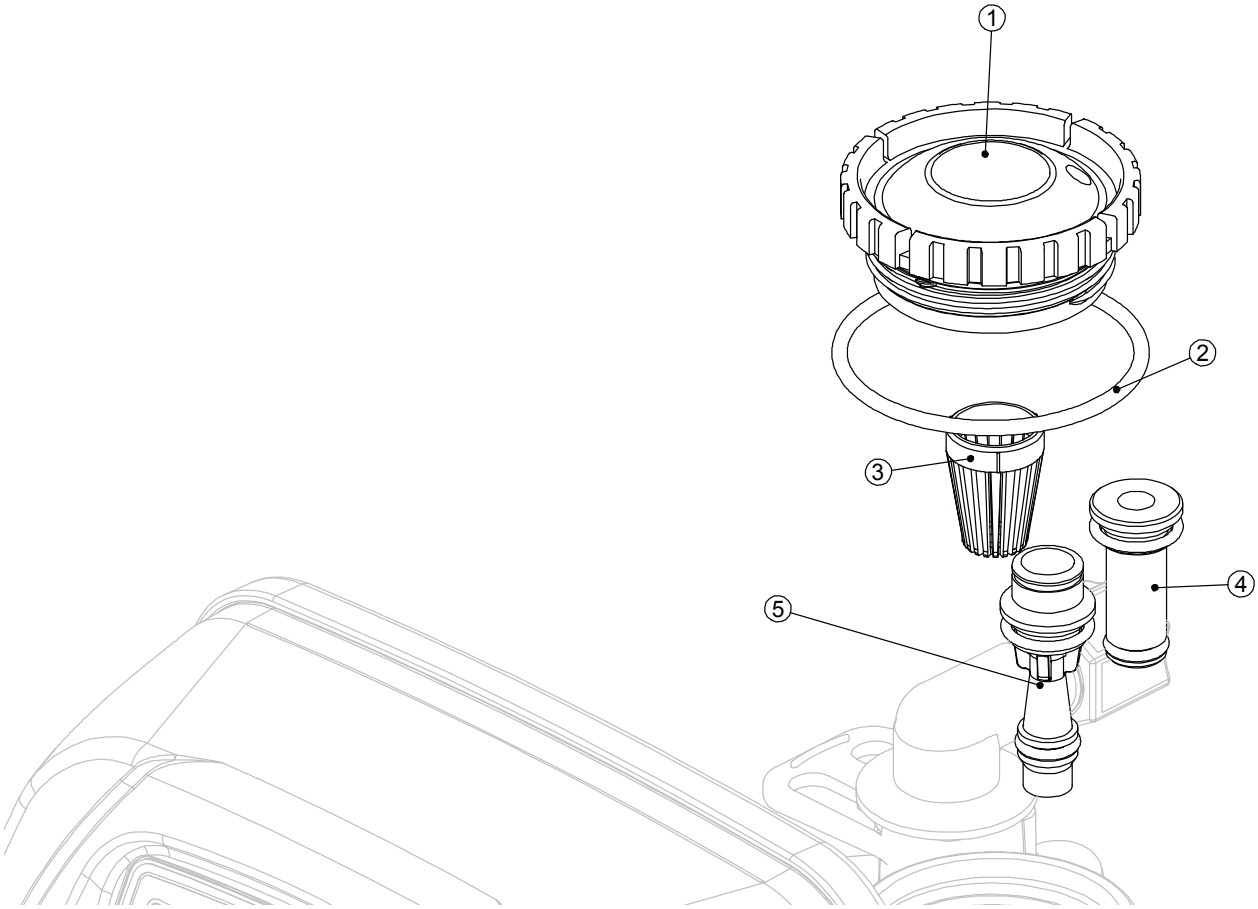


Injector Cap, Injector Screen, Injector, Plug and O-Ring

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3176	INJECTOR CAP	1
2	CV-P-V3152	O-RING 135	1
3	CV-P-V3177-01	INJECTOR SCREEN CAGE	1
4	CV-P-V3010-1Z	INJECTOR ASY Z PLUG	1
5	CV-P-V3010-1E	INJECTOR ASY E WHITE	1
	CV-P-V3010-1F	INJECTOR ASY F BLUE	
	CV-P-V3010-1G	INJECTOR ASY G YELLOW	
Not Shown	CV-P-V3170	O-RING 011	*
Not Shown	CV-P-V3171	O-RING 013	*

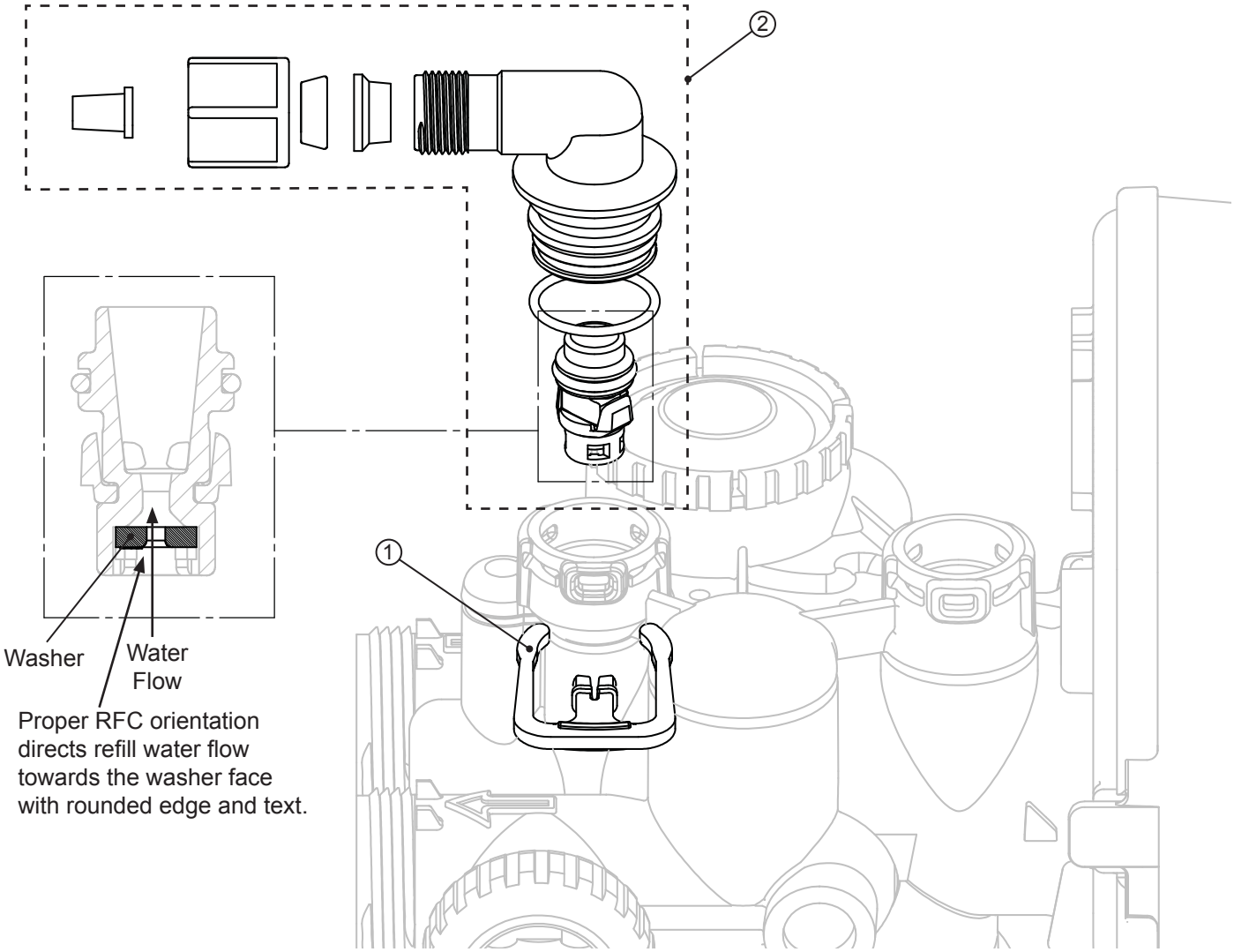
* The injector plug and the injector each contain one 011 (lower) and 013 (upper) o-ring.

CV-P-V3010-1E is used on the XT-32C, XT-48 and XT-60.
CV-P-V3010-1F is used on the XT-70 and XT-70ER.
CV-P-V3010-1G is used on XT-90.



Refill Flow Control Assembly

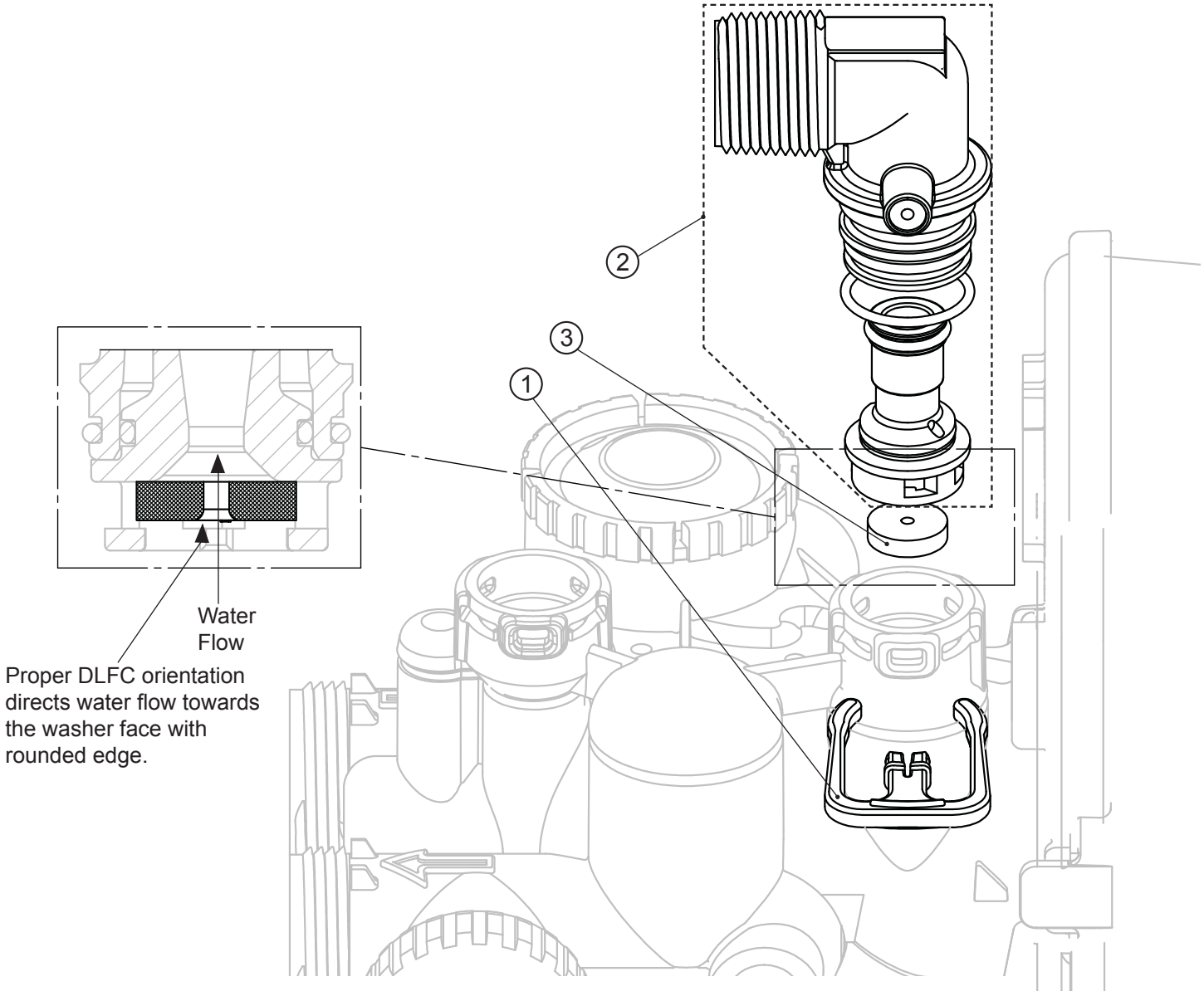
Drawing No.	Order No.	Description	Quantity
1	CV-P-H4615	Elbow Locking Clip	1
2	CV-P-V3330-01	Brine Elbow Asy w/RFC 3/8"	1



Drain Line – 3/4”

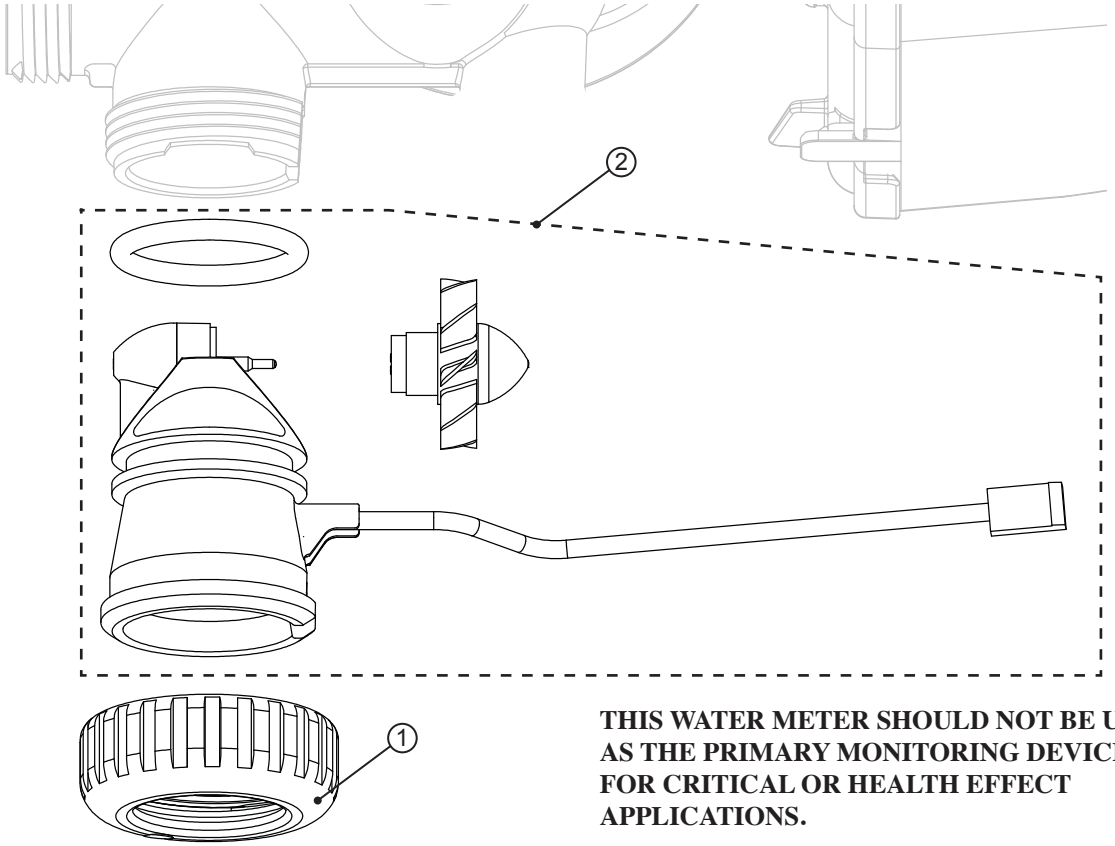
Drawing No.	Order No.	Description	Quantity
1	CV-P-H4615	ELBOW LOCKING CLIP	1
2	CV-P-V3331	DRAIN ELBOW & RETAINER ASSY	1
3	CV-P-V3162-027	DLFC 2.7 GPM FOR ¾	1
	CV-P-V3162-032	DLFC 3.2 GPM FOR ¾	
	CV-P-V3162-042	DLFC 4.2 GPM FOR ¾	

CV-P-V3162-027 is used on the XT-32C, XT-48 and XT-60.
CV-P-V3162-032 is used on the XT-70 and XT-70ER.
CV-P-V3162-042 is used on XT-90.



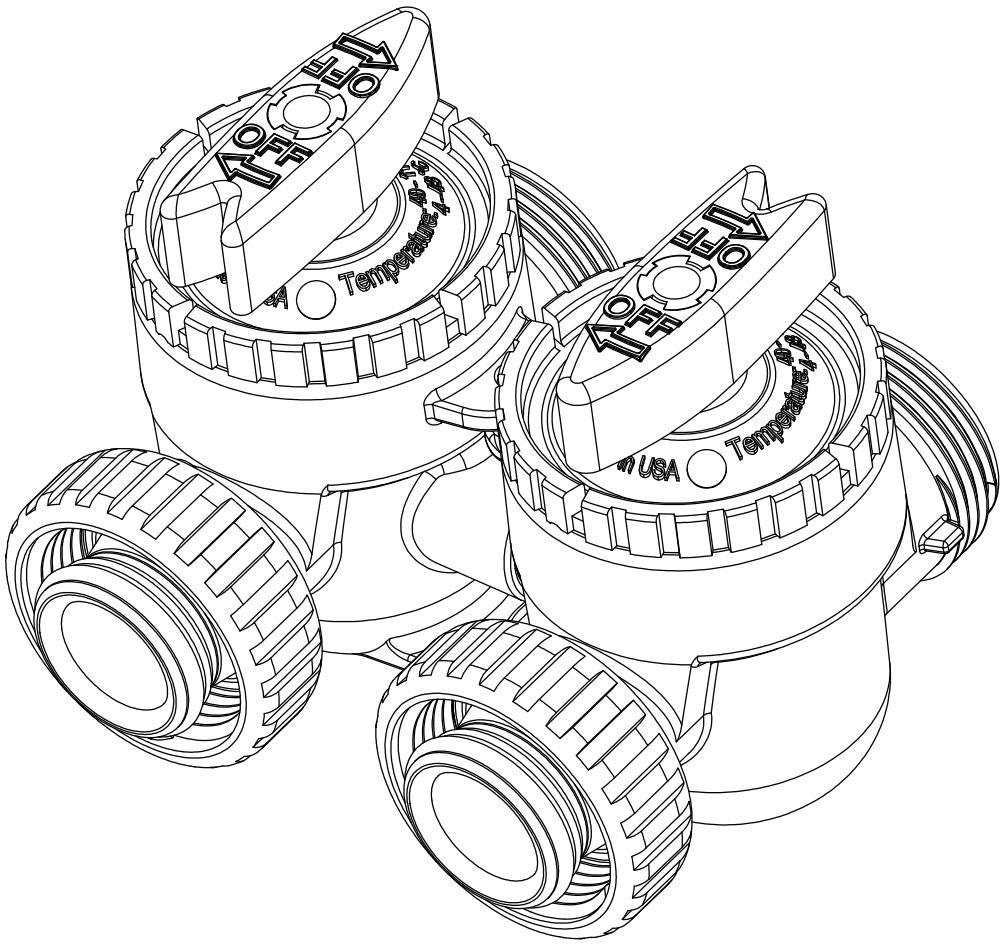
Water Meter

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3151	Nut 1" QC	1
2	CV-P-V3003	Meter ASY	1



THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

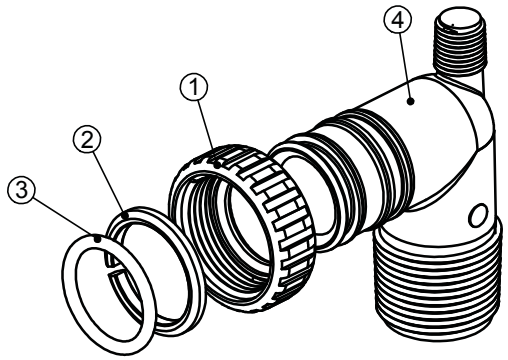
BP-C-V3006 Bypass Valve



Installation Fitting Assemblies

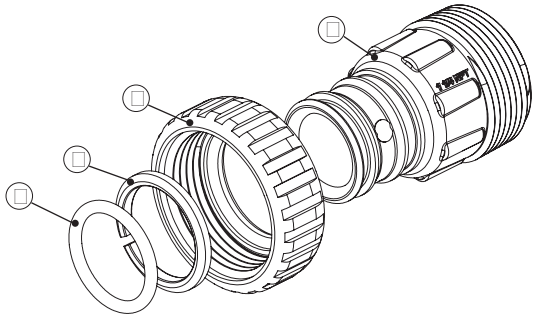
Order No: **BP-C-V3007**
Description: **Fitting 1" PVC Male NPT Elbow Assembly**

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3151	Nut 1" Quick Connect	2
2	CV-P-V3150	Split Ring	2
3	CV-P-V3105	O-Ring 215	2
4	CV-P-V3149	Fitting 1 PVC Male NPT Elbow	2



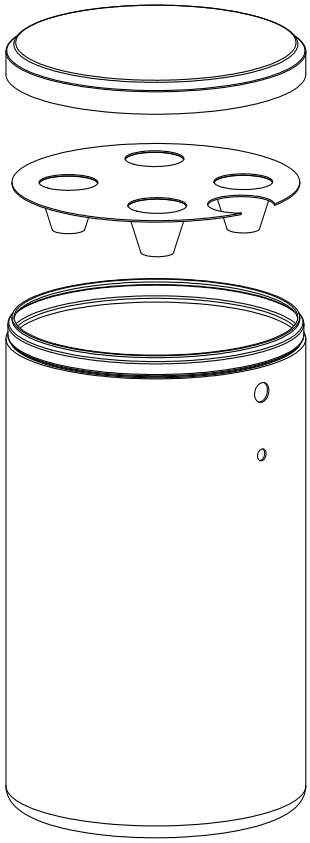
XT-90
Order No: **BP-C-V3007-05**
Description: **Fitting 1-¼" Plastic Male NPT Assembly**

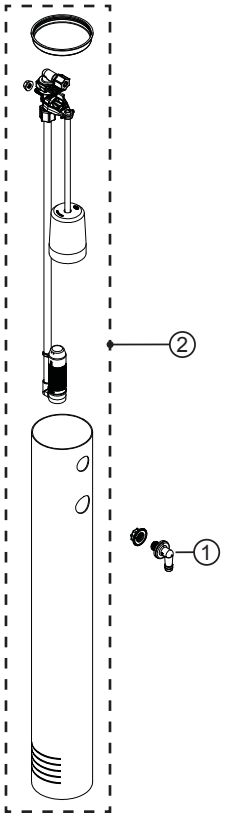
Drawing No.	Order No.	Description	Quantity
1	CV-P-V3151	Nut 1" Quick Connect	2
2	CV-P-V3150	Split Ring	2
3	CV-P-V3105	O-Ring 215	2
4	CV-P-V3317	Fitting 1-¼" Plastic Male NPT	2



Brine Tank Assembly 18 x 40

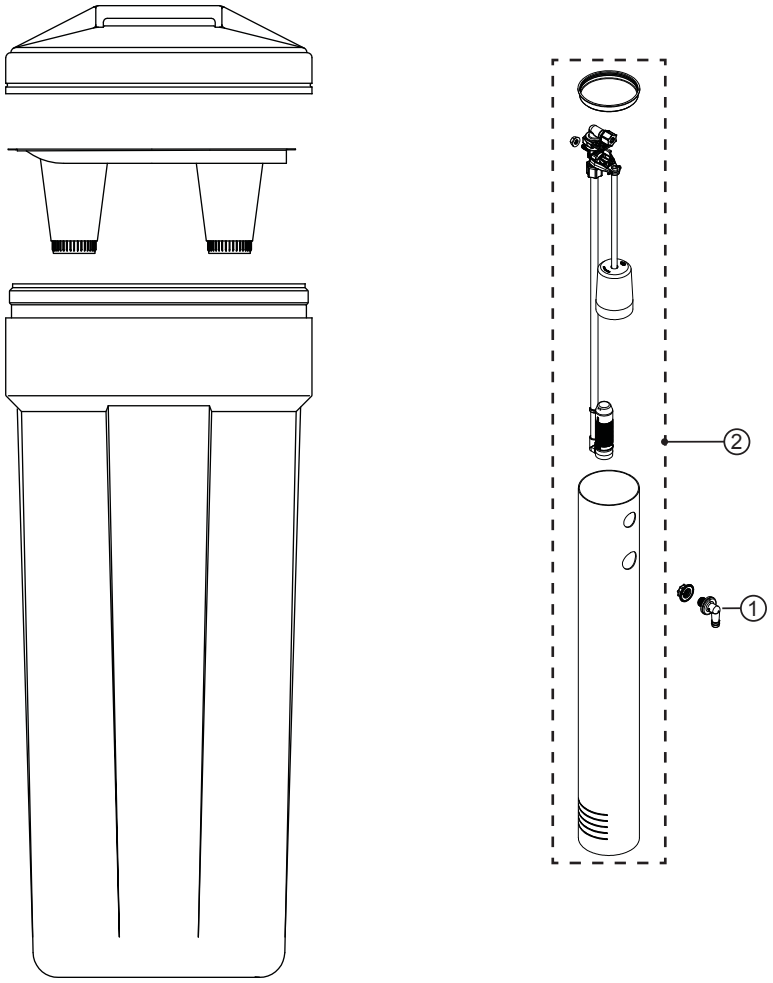
Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-36"	BRINE FLOAT ASSY 474-36	1





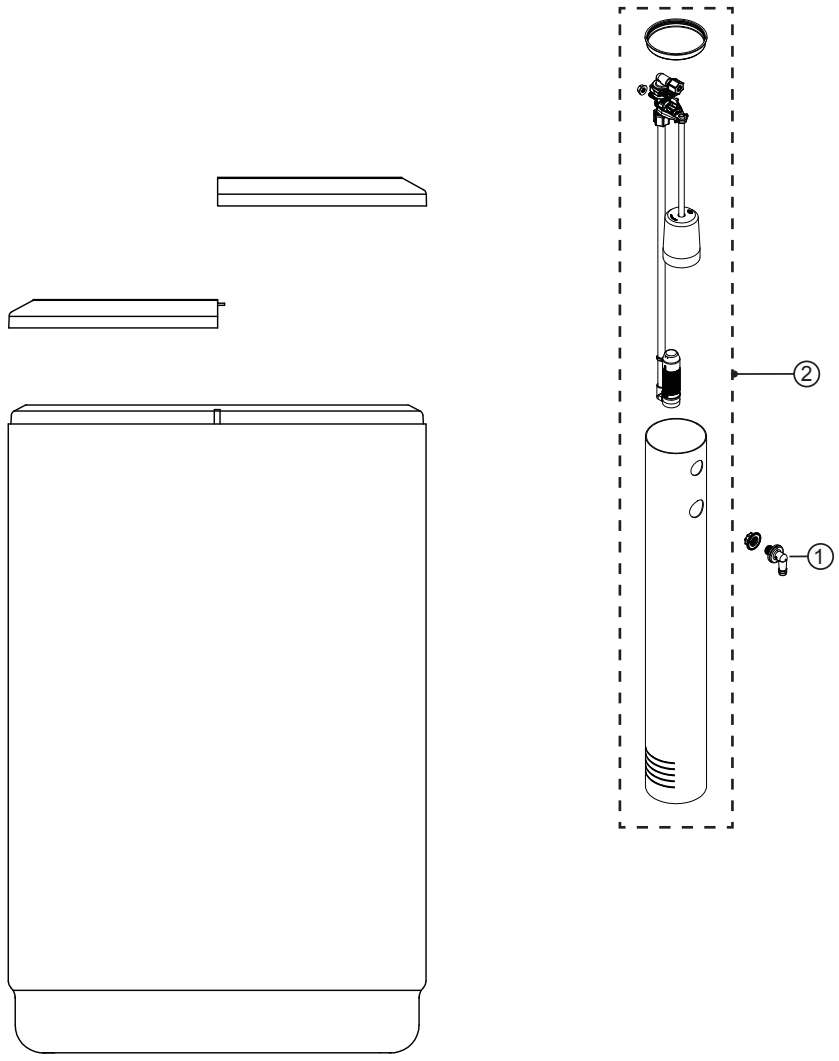
Brine Tank Assembly 14 x 14

Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-30"	BRINE FLOAT ASSY 474-30	1



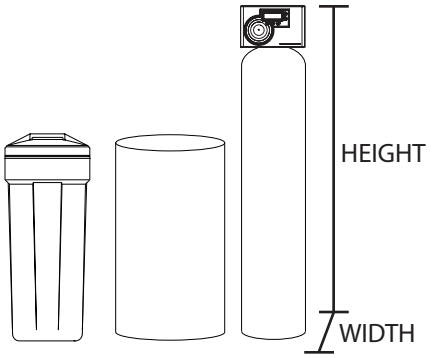
Cabinet Assembly

Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-30"	BRINE FLOAT ASSY 474-30	1



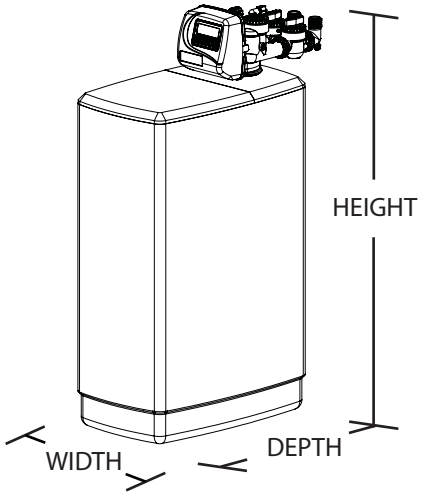
FUSION XT *Series*

Performance Data Sheet



MODEL		XT-48	XT-60	XT-70	XT-90
Rated Softener Capacity* (Grains/Lbs. Salt)	Low	23,500 @6	31,000 @8	39,000 @10	45,000 @11.5
	Medium	29,500 @11.0	39,000 @15.0	50,000 @19.0	58,000 @22
	High	36,000 @19.5	47,000 @25.5	60,000 @32.0	69,000 @37
Max. Service Flow Rate (gpm)		14.3	12.5	15.9	20.2
Max. Pressure Loss at Max Service Flow Rate (psi)		15	15	15	15
Minimum/Maximum Working Pressure (psi)		40/90	40/90	40/90	40/90
Minimum/Maximum Operating Temp. (ºF)		40/100	40/100	40/100	40/100
Maximum Flow to Drain During Regeneration (gpm)		2.7	2.7	3.2	4.2
Amount of High Capacity Cation Resin (Cu. Ft.)		1.3	1.7	2.18	2.5
Electrical Requirements (volts-hertz)		120v 60Hz	120v 60Hz	120v 60Hz	120v 60Hz
Pipe Size		1″	1″	1″	1.25″
Total Dimensions:	Media Tank and Valve	10″W x 52″H	10″W x 62″H	12″W x 60″H	13″W x 62″H
	Brine Tank	14″ x 14″ x 34″	14″ x 14″ x 34″	14″ x 14″ x 34″	18″ x 40″

MODEL		XT-32C
Rated Softener Capacity* (Grains/Lbs. Salt)	Low	18,000 @4.5
	Medium	23,000 @9.0
	High	28,000 @15.0
Max. Service Flow Rate (gpm)		16
Max. Pressure Loss at Max Service Flow Rate (psi)		15
Minimum/Maximum Working Pressure (psi)		40/90
Minimum/Maximum Operating Temp. (ºF)		40/100
Maximum Flow to Drain During Regeneration (gpm)		2.7
Amount of High Capacity Cation Resin (Cu. Ft.)		1
Electrical Requirements (volts-hertz)		120v 60Hz
Pipe Size		1″
Total Dimensions:		13.5″W x 43″H x 23″D



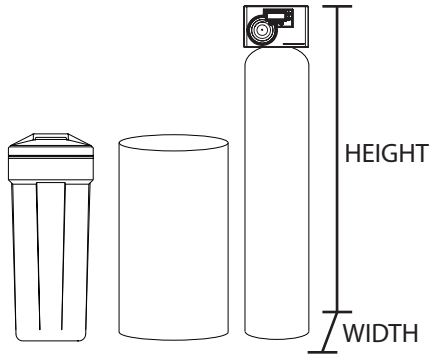
Manufacturer recommends the use of pelletized sodium chloride salt in these water softeners.

These softeners conform to NSF/ANSI 44 for the specific performance claims as verified and substantiated by test data. The operational efficiency is typically less than the efficiency due to individual application factors including water hardness, water usage, and other contaminants that reduce the water softener's capacity.

These water softeners are not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

FUSION XT
Series

Performance Data Sheet



MODEL		XT-70ER
Rated Softener Capacity* (Grains/Lbs. Salt)	Low	39,000 @ 10
	Medium	50,000 @ 19.0
	High	60,000 @ 32.0
Rated Efficiency (grains/pound salt @ minimum salt dose)		4042 @ 9.81
Water Consumption (gallons)		61.9
Max. Service Flow Rate (gpm)		15.9
Max. Pressure Loss at Max Service Flow Rate (psi)		15
Minimum/Maximum Working Pressure (psi)		40/90
Minimum/Maximum Operating Temp. (°F)		40/100
Maximum Flow to Drain During Regeneration (gpm)		3.2
Amount of High Capacity Cation Resin (Cu. Ft.)		2.18
Electrical Requirements (volts-hertz)		120v 60Hz
Pipe Size		1″
Total Dimensions:	Media Tank and Valve	12″W x 60″H
	Brine Tank	14″ x 14″ x 34″

Manufacturer recommends the use of pelletized sodium chloride salt in these water softeners.

These softeners conform to NSF/ANSI 44 for the specific performance claims as verified and substantiated by test data. The Demand Initiated Regeneration (DIR) water softener complies with specific performance specifications intended to minimize the amount of regenerant brine and water used in its operation. Efficiencies are only valid at stated salt dosages and maximum service flow rate.

These water softeners have a rated capacity of not less than 3,350 grains of total hardness exchange per pound. of salt (based on NaCl) and shall not deliver more salt or be operated at a sustained maximum service flow rate greater than its listed rating. Efficiency is measured by a laboratory test described in NSF/ANSI 44.
The test represents the maximum possible efficiency the system can achieve after the system has been installed. The operational efficiency is typically less than the efficiency due to individual application factors including water hardness, water usage, and other contaminants that reduce the water softener's capacity.

These water softeners are not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

See manual for manufacturer's limited warranty. For parts and service contact:
NuGen Pure Water Systems • 28 South 1550 West • Lindon, UT 84042 • (801) 785-7010

PRODUCT WARRANTY

Congratulations on Purchasing one of the finest water conditioning products on the market today.

To the original purchaser: your new water system carries a comprehensive Manufactures Warranty.
Warranty only to original owner at original install site.

Lifetime Warranty Items:
Mineral Tank, Brine Tank, and Control Valve body all carry a lifetime non-prorated warranty.

10 Year Warranty Items:
Cation Softening Resin carries 10-year warranty.
Service and labor charges not included.

5 Year Warranty Items:
All digital and mechanical parts carry a 5-year warranty.
Service and labor charges not included.

NuGen will repair or replace defective part at manufacturers option, provided the part is returned to NuGen Pure Water Systems Inc., freight prepaid. All service must be done by an authorized technician. Service and labor charges are not included.

Maximum Replacement Charges:
Your warranty provides for a MAXIMUM replacement charge PER item of $100.00 (dollars) for any additional system parts not covered under the Life Time Warranty section of the Warranty. All parts being replaced or repaired must be returned freight prepaid to NuGen Pure Water Systems Inc. Service and Labor charges are not included.

Warranty Exclusions:
• Defective Warranty part or parts will be repaired or replaced at Manufacturers option, F.O.B., Lindon, Utah.
• All systems must be installed correctly and meet all State and Local Plumbing Codes.
• All service must be performed by an Authorized Factory Technician.
• This Warranty does not apply to systems that have been neglected, miss-applied or have had hot water back feeding into the system.
• This Warranty does not apply to systems that have been installed on water pressures less than 40 PSI or greater than 90 PSI, or systems that have been installed where sand, silt, turbidity or where excess iron and organics are present in the raw water supply.
• Manufacturer is not liable for any freight, loss and damage, service and or labor charges due to a defective part.
• This Warranty does not apply to system damage due to fire, flood, freezing, power surges, brown outs, earthquakes or any other natural disasters.

This warranty gives your specific legal rights. You may also have other and additional rights which may vary from state to state by statutory provisions. NuGen Pure Water Systems Inc. will not be responsible for labor charges, loss, or damages caused by defective part.

NuGen Pure Water Systems Inc.
28 South 1550 West
Lindon, Utah 84042
Phone: (801) 785-7010
Fax: (801) 785-7044
(L-W-EX-11)