

Operation Manual



**742/762 Control
255 and Performa Serie Valves
(263, 268, 268FA, 278)**



GE Infrastructure Water & Process Technologies

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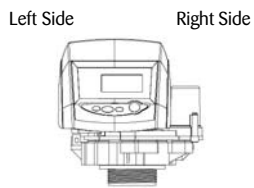
MANUAL OVERVIEW

How to use this manual

This installation manual is designed to guide the installer through the process of installing and starting conditioners featuring the 700 Logix series controllers.

This manual is a reference and will not include every system installation situation. The person installing this equipment should have:

- Training in the 700 Logix series controllers and water conditioner installation
- Knowledge of water conditioning and how to determine proper control settings
- Basic plumbing skills
- The directional instructions "left" and "right" are determined by looking at the front of the unit.



Icons That Appear in This Manual



WARNING: Failure to follow this instruction can result in personal injury or damage to the equipment.



NOTE: This will make the process easier if followed

EQUIPMENT INSTALLATION

General Warnings And Safety Information

Electrical

There are no user-serviceable parts in the AC adapter, motor, or controller. In the event of a failure, these should be replaced.

- All electrical connections must be completed according to local codes.
- Use only the power AC adapter that is supplied.
- The power outlet must be grounded.
- To disconnect power, unplug the AC adapter from its power source.

Mechanical

- Do not use petroleum based lubricants such as vaseline, oils, or hydrocarbon based lubricants. Use only 100% silicone lubricants.
- All plastic connections should be hand tightened. Teflon tape may be used on connections that do not use an O-ring seal. **Do not use pliers or pipe wrenches.**
- All plumbing must be completed according to local codes.
- Soldering near the drain line should be done before connecting the drain line to the valve. Excessive heat will cause interior damage to the valve.
- Observe drain line requirements.
- Do not use lead-based solder for sweat solder connections.
- The drain line must be a minimum of 1/2-inch diameter. Use 3/4-inch pipe if the back-wash flow rate is greater than 7 GPM (26.5 Lpm) or the pipe length is greater than 20 feet (6 m).
- Do not support the weight of the system on the control valve fittings, plumbing, or the bypass.
- It is not recommended to use sealants on the threads. Use Teflon* tape on the threads of the 1-inch NPT elbow, the drain line connections, and other NPT threads.

*Teflon is a trademark of E.I. duPont de Nemours.

General

- Observe all warnings that appear in this manual.
- Keep the media tank in the upright position. Do not turn on side, upside down, or drop. Turning the tank upside down will cause media to enter the valve.
- Operating ambient temperature is between 34°F (1°C) and 120°F (49°C).
- Operating water temperature is between 34°F (1°F) and 100°F (38°C).
- Working water pressure range is 20 to 120 psi (1.38 to 8.27 bar). In Canada the acceptable working water pressure range is 20 to 100 psi (1.38 to 6.89 bar).
- Use only regenerant salts designed for water softening. Do not use ice melting, block, or rock salts.
- Follow state and local codes for water testing. Do not use water that is micro biologically unsafe or of unknown quality.
- When filling media tank, do not open water valve completely. Fill tank slowly to prevent media from exiting the tank.
- When installing the water connection (bypass or manifold) connect to the plumbing system first. Allow heated parts to cool and cemented parts to set before installing any plastic parts. Do not get primer or solvent on O-rings, nuts, or the valve.

System Regeneration Cycle (7-Cycle Operation)

1. **Service (Downflow) – Cycle C0**
 Untreated water is directed down through the resin bed and up through the riser tube. The hardness ions attach themselves to the resin and are removed from the water. The water is conditioned as it passes through the resin bed.
2. **Backwash (Upflow) – Cycles C1, C6**
 The flow of water is reversed by the control valve and directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris is flushed to the drain.
3. **Brine/Slow Rinse (Downflow) – Cycles C2, C3**
 The control directs water through the brine injector and brine is drawn from the regenerant tank. The brine is then directed down through the resin bed and up through the riser tube to the drain. The hardness ions are displaced by sodium ions and are sent to the drain. The resin is regenerated during the brine cycle. Brine draw is completed when the air check closes.
4. **Repressurize Cycle (Hard Water Bypass Flapper Open) – Cycle C4**
 This cycle allows the air and water to hydraulically balance in the valve before continuing the regeneration.
5. **Fast Rinse (Downflow) – Cycles C5, C7**
 The control directs water down through the resin bed and up through the riser tube to the drain. Any remaining brine residual is rinsed from the resin bed.
6. **Brine Refill – Cycle C8**
 Brine refill occurs during a portion of the fast rinse cycle. Water is directed to the regenerant tank at a controlled rate, to create brine for the next regeneration.

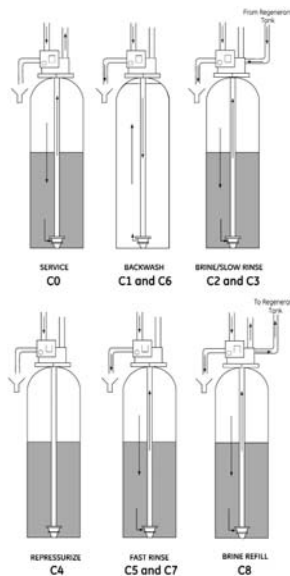


Figure 1

Valve Features

Figure 2
255 Valve Identification

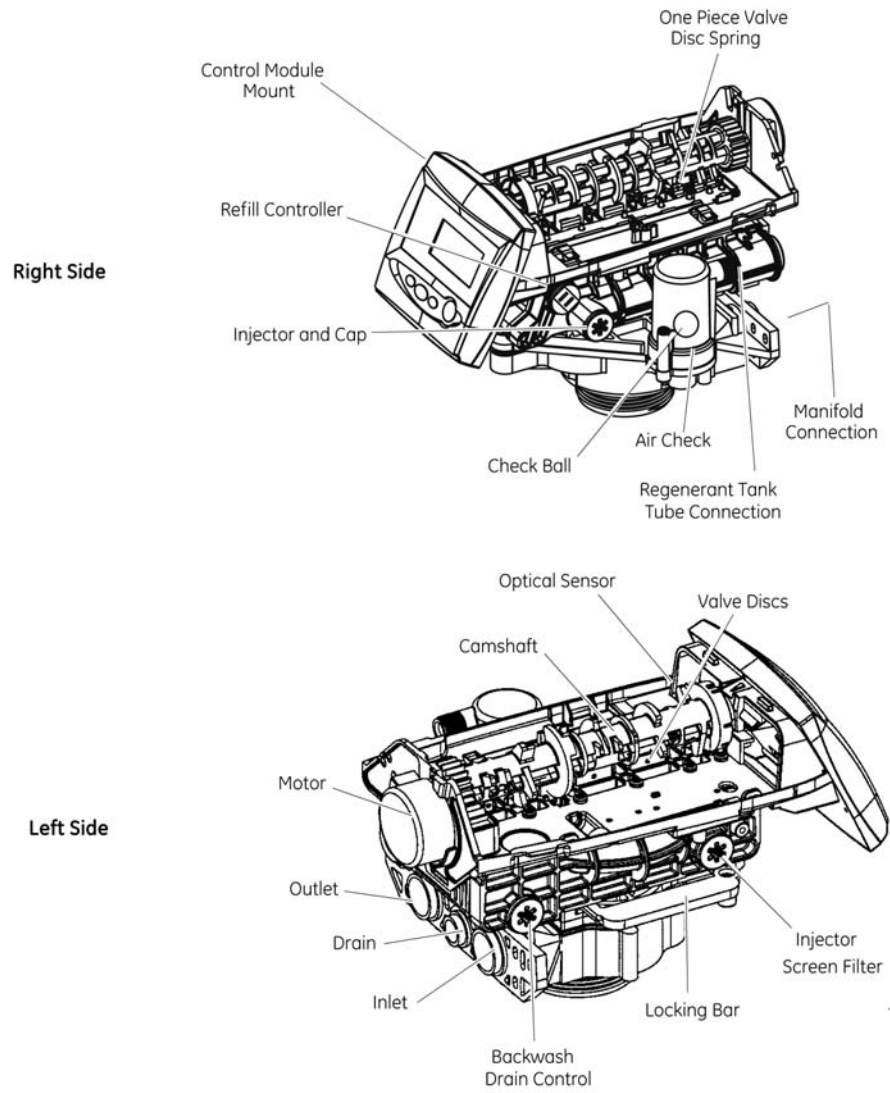


Figure 3
Performa and Performa Cv Valve Identification

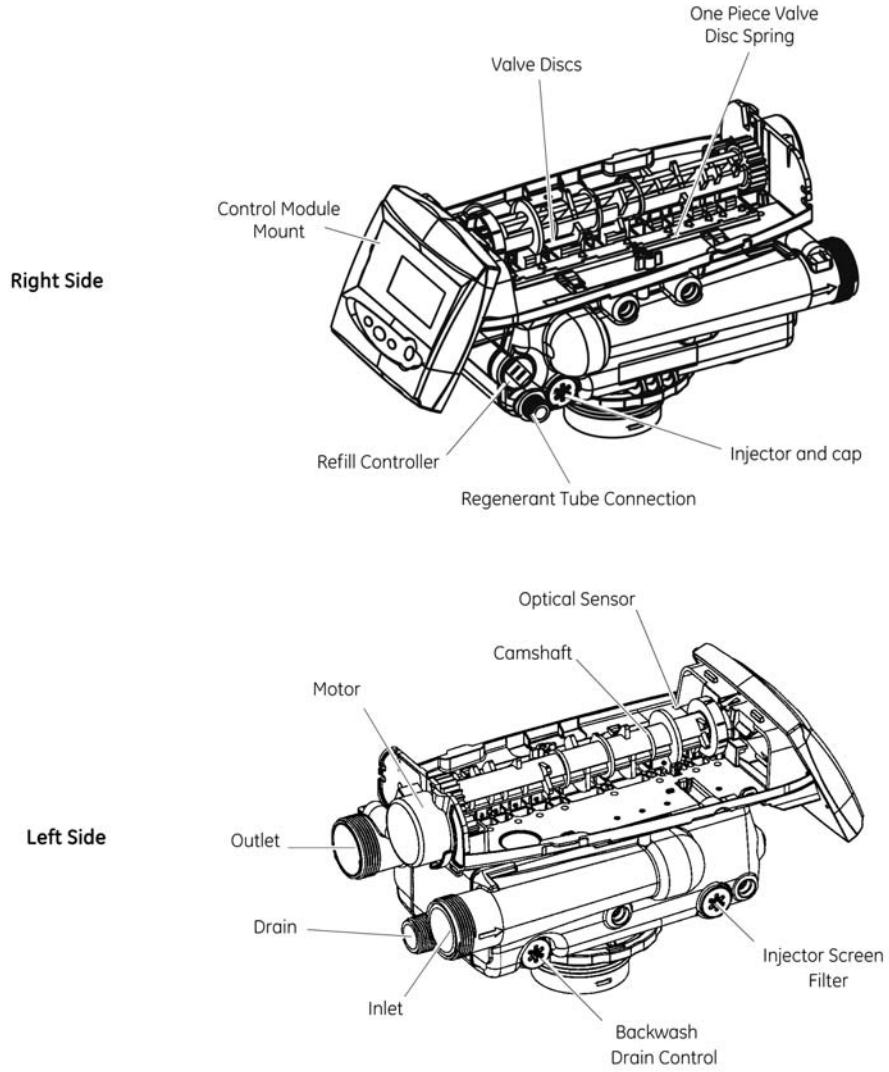
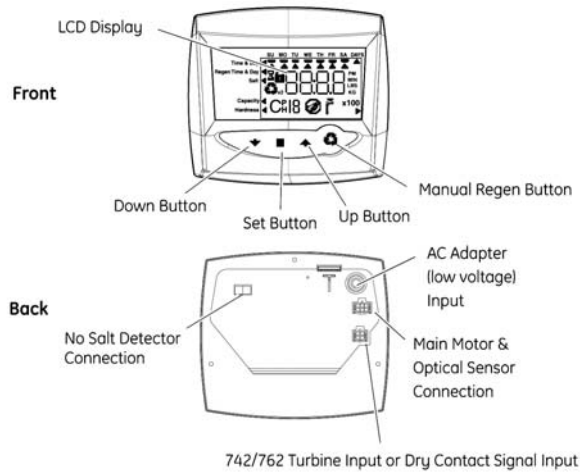


Figure 4
700 Series Controller Identification



Location Selection

Location of a water treatment system is important. The following conditions are required:

- Level platform or floor.
- Room to access equipment for maintenance and adding regenerant (salt) to tank.
- Ambient temperatures over 34°F (1°C) and below 120°F (49°C).
- Water pressure below 120 psi (8.27 bar) and above 20 psi (1.4 bar).
- In Canada the water pressure must be below 100 psi (6.89 bar).
- Constant electrical supply to operate the controller.
- Total minimum pipe run to water heater of ten feet (three meters) to prevent backup of hot water into system.
- Local drain for discharge as close as possible.
- Water line connections with shutoff or bypass valves.
- Must meet any local and state codes for site of installation.
- Valve is designed for minor plumbing misalignments. Do not support weight of system on the plumbing.
- Be sure all soldered pipes are fully cooled before attaching plastic valve to the plumbing.

Outdoor Locations

When the water conditioning system is installed outdoors, several items must be considered.

- Moisture

The valve and 700 controller are rated for NEMA 3 locations. Falling water should not affect performance.

The system is not designed to withstand extreme humidity or water spray from below. Examples are: constant heavy mist, near corrosive environment, upwards spray from sprinkler.

- Direct Sunlight

The materials used will fade or discolor over time in direct sunlight. The integrity of the materials will not degrade to cause system failures.

If it is necessary to locate the conditioner in direct sunlight, a protective outdoor cover (P/N 1267811) over the valve and controller is necessary.

- Temperature

Extreme hot or cold temperatures may cause damage to the valve or controller.

Freezing temperatures will freeze the water in the valve. This will cause physical damage to the internal parts as well as the plumbing.

High temperatures will affect the controller. The display may become unreadable but the controller should continue to function. When the temperature drops down into normal operating limits the display will return to normal. A protective cover, P/N 1267811, should assist with high temperature applications.

- Insects – The controller and valve have been designed to keep all but the smallest insects out of the critical areas. Any holes in the top plate can be covered with a metal foil duct work tape. The top cover should be installed securely in place.

- Wind – The Logix cover is designed to withstand a 30 mph (48 Kph) wind when properly installed on the valve.

Water Line Connection

A bypass valve system should be installed on all water conditioning systems. Bypass valves isolate the conditioner from the water system and allow unconditioned water to be used. Service or routine maintenance procedures may also require that the system is bypassed. Figures 5, 6, and 7 show the three common bypass methods.

Figure 5
 Series 256 bypass for use with 255 valve body

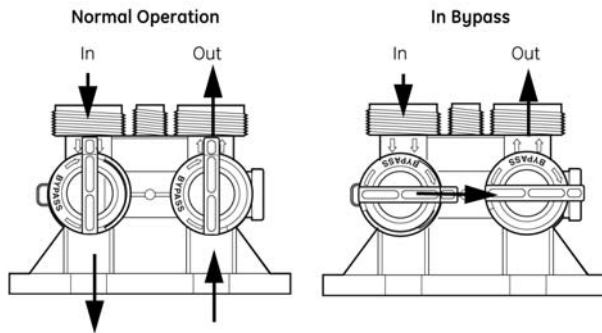


Figure 6
 Series 1265 bypass for use with Performa valve bodies

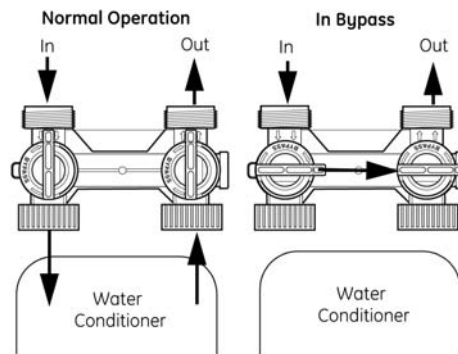
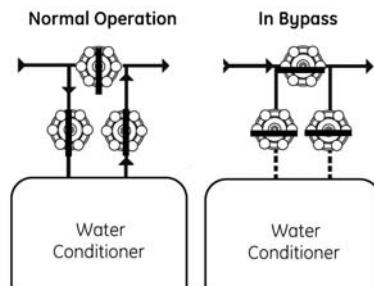


Figure
 Typical Globe Valve Bypass System





WARNING: The inlet water must be connected to the inlet port of the valve. When replacing non-Autotrol valves, the inlet and outlet may be reversed. It is also possible for the plumbing to be installed in an opposite order. Do not solder pipes with lead-based solder.



WARNING: Do not use tools to tighten plastic fittings. Over time, stress may break the connections. When the 1265 or 256 bypass valve is used, only hand tighten the plastic nuts.



WARNING: Do not use petroleum grease on gaskets when connecting bypass plumbing. Use only 100% silicone grease products when installing any plastic valve. Non-silicone grease may cause plastic components to fail over time.

Drain Line Connection



NOTE: Standard commercial practices are expressed here. Local codes may require changes to the following suggestions. Check with local authorities before installing a system.

1. The unit should be above and not more than 20 feet (6.1 m) from the drain. Use an appropriate adapter fitting to connect 1/2-inch (1.3 cm) plastic tubing to the drain line connection of the control valve.
2. If the backwash flow rate exceeds 5 gpm (22.7 Lpm) or if the unit is located 20-40 feet (6.1-12.2 m) from drain, use 3/4-inch (1.9 cm) tubing. Use appropriate fittings to connect the 3/4-inch tubing to the 3/4-inch NPT drain connection on valve.
3. The drain line may be elevated up to 6 feet (1.8 m) providing the run does not exceed 15 feet (4.6 m) and water pressure at the conditioner is not less than 40 psi (2.76 bar). Elevation can increase by 2 feet (61 cm) for each additional 10 psi (0.69 bar) of water pressure at the drain connector.
4. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 7-inch (18-cm) loop at the far end of the line so that the bottom of the loop is level with the drain line connection. This will provide an adequate siphon trap.

Where the drain empties into an overhead sewer line, a sink-type trap must be used. Secure the end of the drain line to prevent it from moving.

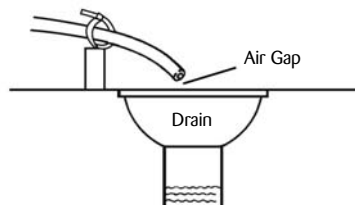


Figure 8
Drain Line Connection



NOTE: Waste connections or drain outlet shall be designed and constructed to provide for connection to the sanitary waste system through an air-gap of 2 pipe diameters or 1 inch (22 mm) whichever is larger.



WARNING: Never insert drain line directly into a drain, sewer line, or trap (Figure 8). Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.

Overflow Line Connection (not used with 3-cycle filter system)

In the event of a malfunction, the regenerant TANK OVERFLOW will direct “overflow” to the drain instead of spilling on the floor. This fitting should be on the side of the cabinet or regenerant tank. Most tank manufacturers include a post for the tank overflow connector.

To connect the overflow line, locate hole on side of tank. Insert overflow fitting into tank and tighten with plastic thumb nut and gasket as shown (Figure 9). Attach length of 1/2-inch (1.3-cm) I.D. tubing (not supplied) to fitting and run to drain. Do not elevate overflow line higher than overflow fitting.

Do not tie into drain line of control unit. Overflow line must be a direct, separate line from overflow fitting to drain, sewer or tub. Allow an air gap as per drain line instructions.



Figure 9
Overflow Line Connection

Regenerant Line Connection (not used with 3-cycle filter system)

The regenerant line from the tank connects to the valve. Make the connections and hand tighten. Be sure that the regenerant line is secure and free from air leaks. Even a small leak may cause the regenerant line to drain out, and the conditioner will not draw regenerant from the tank. This may also introduce air into the valve causing problems with valve operation.

Most installations utilize a tank check valve. This is not necessary when using the 255 valve with the built-in aircheck. Using a tank check valve with the 255 valve with aircheck will result in premature checking of the aircheck valve, before the tank is empty.

Figure 10
Air Check for 255 valve

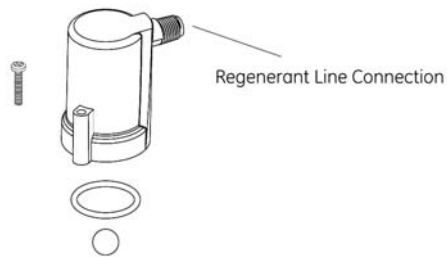
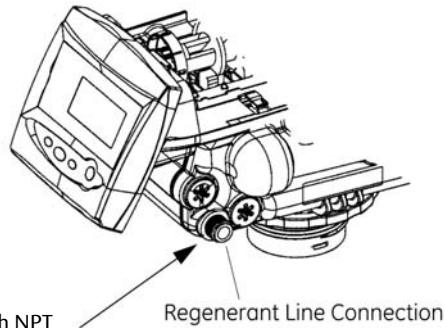


Figure 11
Regenerant Connection
for Performa Valve



NOTE: Be sure to use a 3/8 inch NPT plumbing connection when attaching regenerant line to the Performa valve.

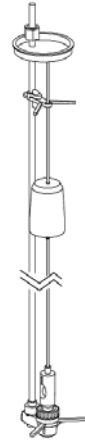


NOTE: When installing a 3-cycle filter (253, 263, or 273 valve) use a cap on the regenerant line connection to prevent water seepage from the port. See Parts and Accessories section for part number.

An aircheck must be used in the regenerant line when installing a Performa valve.

Figure 12
Regenerant Tank Check Valve
(not provided)*

* Furnished as an option from conditioner system manufacturer.



Electrical Connection

All 700 Series controllers operate on 12-volt alternating current power supply. This requires use of the supplied AC adapter. A variety of AC adapters are available for different applications. These AC adapters are available from your supplier. They include:

AC Adapter	Input Voltage	Application	Part Number
Standard wall-mount AC adapter	120 V 60 Hz	Standard indoor application	1000811
Outdoor rated AC adapter	120 V 60 Hz	UL listed for outdoor installations	1235448
International option AC adapters	Varies based on country	Standard indoor application	See Parts Lists Section

100 VAC, 120 VAC, and 230 VAC AC Adapters

Make sure power source matches the rating printed on the AC adapter.



NOTE: The power source should be constant. Be certain the AC adapter is not on a switched outlet. Power interruptions longer than 8 hours may cause the controller to lose the time and day settings. When power is restored, the day and time settings must then be re-entered.

The 700 Series controller is available in two power configurations. The North American controller operates on 60 Hz. If the incoming power is 50 Hz, the "North American" controller will not function. The error code "ERR 2" will show on the display.

The "World" controller will sense the input power as 50 or 60 Hz and operate accordingly.

Controller Location

The 700 Series controllers are designed to be mounted on the valve or attached to a flat surface. Installations that do not provide easy access to the valve can have the controller mounted for remote operation.

A remote mount connection, P/N 1256257, is available for the 700 Series controller.

Valve Camshaft

The front end of the camshaft has an indicator cup. The cup has slots in the outer periphery and numbers on the inside face (Figure 13,14).

The numbers can be seen with the cover off, from the front over the top of the controller. The number at the top indicates which regeneration cycle is currently in progress.

Figure 13
Camshaft Front End
for 255, 263, and 268 valve bodies

The corresponding slot for the number is positioned at the optical sensor which is approximately 90 degrees out of phase.

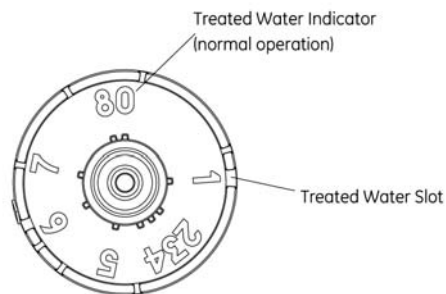
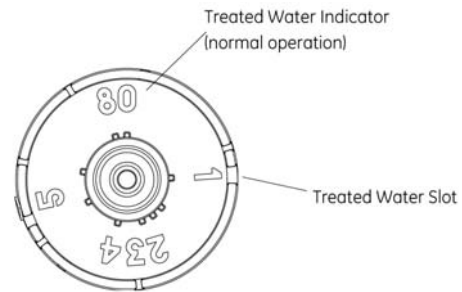


Figure 14
Camshaft Front End
for 273, and 278 valve bodies

The corresponding slot for the number is positioned at the optical sensor which is approximately 90 degrees out of phase.



Regeneration Cycle Indicators

C0 = Treated Water - normal operation mode

C1 = Backwash Cycle

C2 = Regenerant Draw Cycle (not used in filter mode)

C3 = Slow Rinse Cycle (not used in filter mode)

C4 = System Pause (Repressurization cycle)

C5 = Fast Rinse Cycle 1

C6 = Backwash Cycle 2 (not used in filter mode and with 278 valve)

C7 = Fast Rinse Cycle 2 (not used in filter mode and with 278 valve)

C8 = Regenerant Refill (not used in filter mode)

Valve Disc Operation

Figure 15 - 255 Valve

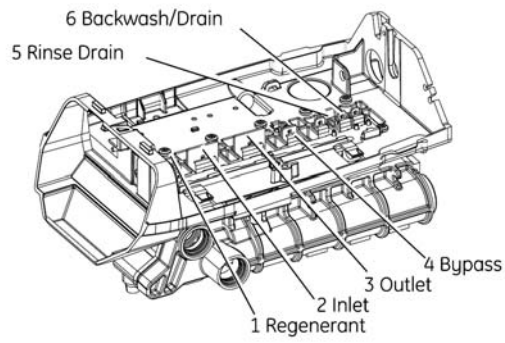


Figure 16a - Performa Valve (263,268)

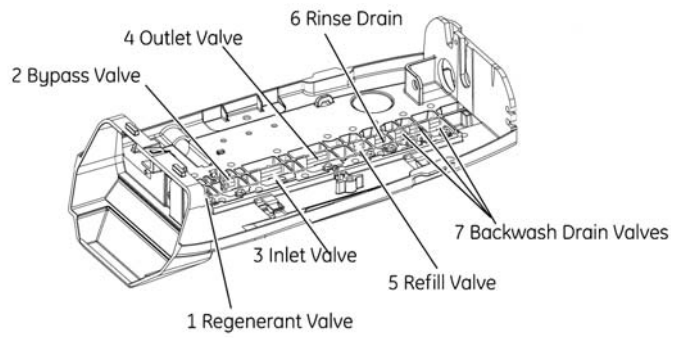
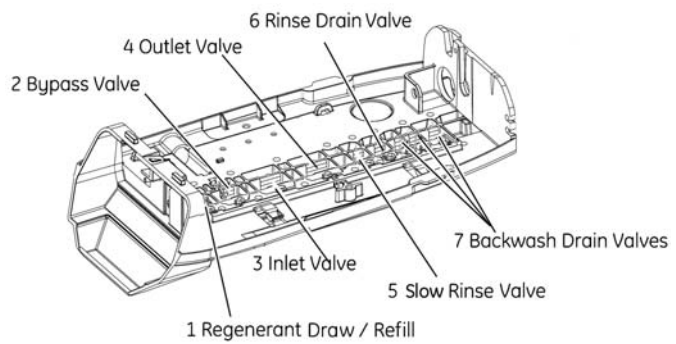


Figure 16b - Performa Cv Valve (278)



SYSTEM DISINFECTION

Disinfection Of Water Conditioners

The materials of construction of the modern water conditioner will not support bacterial growth, nor will these materials contaminate a water supply. During normal use, a conditioner may become fouled with organic matter, or in some cases with bacteria from the water supply. This may result in an off-taste or odor in the water.

Some conditioners may need to be disinfected after installation and some conditioners will require periodic disinfection during their normal life.

Depending upon the conditions of use, the style of conditioner, the type of ion exchanger, and the disinfectant available, a choice can be made among the following methods.

Sodium or Calcium Hypochlorite

Application

These materials are satisfactory for use with polystyrene resins, synthetic gel zeolite, greensand and bentonites.

5.25% Sodium Hypochlorite

These solutions are available under trade names such as Clorox*. If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.

1. Dosage
 - A. Polystyrene resin; 1.2 fluid ounce (35.5 mL) per cubic foot.
 - B. Non-resinous exchangers; 0.8 fluid ounce (23.7 mL) per cubic foot.
2. Brine tank conditioners
 - A. Backwash the conditioner and add the required amount of hypochlorite solution to the well of the regenerant tank. The regenerant tank should have water in it to permit the solution to be carried into the conditioner.
 - B. Proceed with the normal regeneration.

**Clorox is a trademark of the Clorox Company.*

Calcium Hypochlorite

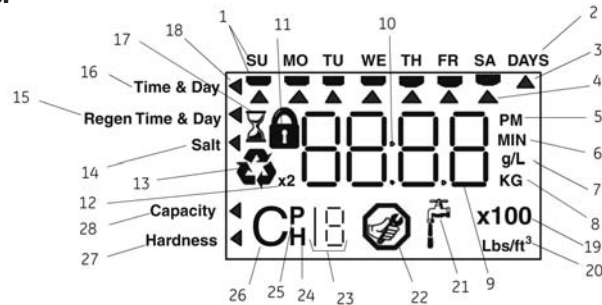
Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials may be used directly without dissolving before use.

1. Dosage
 - A. Two grains (approximately 0.1 ounce [3 mL]) per cubic foot.
2. Regenerant tank conditioners
 - A. Backwash the conditioner and add the required amount of hypochlorite to the well of the regenerant tank. The regenerant tank should have water in it to permit the chlorine solution to be carried into the conditioner.
 - B. Proceed with the normal regeneration.

GENERAL 700 SERIES INSTRUCTIONS

Display Icons 700 Controller

Figure 17



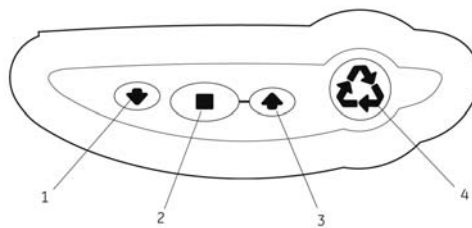
NOTE: In normal operation and during programming, only a few of the icons will actually be displayed.

1. Days of the week. The flag immediately below the day will appear when that day has been programmed as a day the system should regenerate (used with 7-day timer programming).
2. See #3
3. This cursor is displayed when the days between regeneration are being programmed (used with .5 to 99 day regeneration programming).
4. One of these cursors will be displayed to indicate which day will be programmed into the controller.
5. "PM" indicates that the time displayed is between 12:00 noon and 12:00 midnight (there is no AM indicator). PM indicator is not used if clock mode is set to 24-hour.
6. When "MIN" is displayed, the value entered is in minute increments.
7. When "g/L" is displayed, the value for regenerant amount entered is in grams/Liter.
8. When "Kg" is displayed, the value entered is in kilograms or kilograins.
9. Four digits used to display the time or program value. Also used for error codes.
10. Colon flashes as part of the time display. Indicates normal operation (742 only).
11. Locked/unlocked indicator. In Level I programming this is displayed when the current parameter is locked-out. It is also used in Level II programming to indicate if the displayed parameter will be locked (icon will flash) when controller is in Level I.
12. When "x2" is displayed, a second regeneration has been called for.
13. The recycle sign is displayed (flashing) when a regeneration at the next time of regeneration has been called for. Also displayed (continuous) when in regeneration.
14. The display cursor is next to "SALT" when programming the amount of regenerant. If the controller is on a 3-cycle filter then backwash time is programmed.
15. The display cursor is next to "REGEN TIME & DAY" when programming the time of regeneration and the days of regeneration.
16. The display cursor is next to "TIME & DAY" when programming the current time and day.
17. The hourglass is displayed when the motor is running. The camshaft should be turning.
18. These cursors will appear next to the item that is currently displayed.

- 19. X100 multiplier for large values.
- 20. When Lbs/ft³ is displayed the value for regenerant amount entered is in pounds/cubic foot.
- 21. Faucet is displayed when the current flow rate is displayed. Control may show the faucet and "0", indicating no flow.
- 22. Maintenance interval display turns on if the months in service exceed the value programmed in P11.
- 23. Used with #24, #25, and #26. Displays a sequence number or a value.
- 24. History Values (H). The number displayed by #23 identifies which history value is currently displayed.
- 25. Parameter (P). Displayed only in Level II Programming. The number displayed by #23 identifies which parameter is currently displayed.
- 26. Cycle (C). The number displayed by #23 is the current cycle in the regeneration sequence.
- 27. Hardness setting—only used with 760 and 762 controllers.
- 28. Capacity display—shows estimated system capacity.

Keypad - Buttons

Figure 18



- 1. **DOWN arrow.** Generally used to scroll down or increment through a group of choices.
- 2. **SET.** Used to accept a setting that normally becomes stored in memory. Also used together with the arrow buttons.
- 3. **UP arrow.** Generally used to scroll up or increment through a group of choices.
- 4. **Regenerate.** Used to command the controller to regenerate. Also used to change the lock mode.







NOTE: If a button is not pushed for thirty seconds, the controller returns to normal operation mode. Pushing the Regenerate button immediately returns the controller to normal operation.

Programming Conventions

The 700 series controller is programmed using the buttons on the keypad. The programming instructions will be described two ways whenever a section has keypad input. First, a table shows simplified instructions. Second, text follows that describes the action. In each table:

"Action" lists the event or action desired.

"Keys" are listed as:

-  UP for up arrow
-  DOWN for down arrow
-  SET for set
-  REGEN for regeneration

"Duration" describes how long a button is held down:

P/R for press and release

HOLD for press and hold

X sec for a number of seconds to press the button and hold it down

"Display" calls out the display icons that are visible.

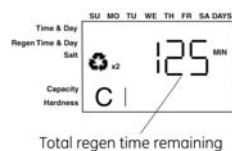
REGENERATION MODES

The 700 Series controllers can be regenerated either automatically or manually. During a regeneration, the total time remaining of the regeneration will be displayed on the controller. The current cycle is shown in the lower left of the display.

To Initiate a Manual Regeneration:

- Press REGEN once for delayed regeneration. System will regenerate at next set regen time (2:00 AM). A flashing regen (recycle) symbol will be displayed.
- Press and hold REGEN for 5 seconds to initiate immediate manual regeneration. A solid regen symbol will be displayed.
- After immediate regeneration has begun, press REGEN again to initiate a second manual regeneration. A flashing "x2" symbol indicates the second regeneration will start at the time of regeneration. Press and hold REGEN to turn on the second regeneration immediately following the current regeneration. The double regeneration is indicated by the "x2" symbol being on steady.

During a Regeneration:



- A "C#" is displayed to show current cycle.
- Total regen time remaining is displayed on screen.
- Press and hold SET to show current cycle time remaining.

To Advance Regeneration Cycles:

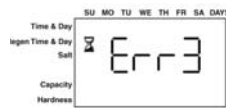
- Press and hold SET - showing current cycle time.
- Simultaneously press SET and UP to advance on cycle. An hourglass will display while cam is advancing.
When cam reaches next cycle, "C2" will be displayed.
- Repeat SET and UP to advance through each cycle.
- Press and hold SET and UP for 5 seconds to cancel regen.
Hourglass will flash once cancelled.
Camshaft will advance to home – may take 1 to 2 minutes.

Regeneration Cycle:

- C0 = Treated Water - normal operation mode
- C1 = Backwash Cycle
- C2 = Regenerant Draw Cycle (not used in filter mode)
- C3 = Slow Rinse Cycle (not used in filter mode)
- C4 = System Pause (Repressurization cycle)
- C5 = Fast Rinse Cycle 1
- C6 = Backwash Cycle 2 (not used in filter mode and with 278 valve)
- C7 = Fast Rinse Cycle 2 (not used in filter mode and with 278 valve)
- C8 = Regenerant Refill (not used in filter mode)

742/762 SERIES INITIAL POWER-UP

Initial Power Up – (Camshaft proceeds to HOME position)



- At initial power-up, the camshaft may need to rotate to the HOME (in service position).
- Camshaft may take 1 to 2 minutes to return to HOME position.
- Err 3 will be displayed until the camshaft returns to HOME position.
- If more than 2 minutes elapses, verify that the motor is turning the camshaft. If it is not turning, contact Dealer.



NOTE: The 700 Series controller features a self-test sequence. At first power-up of the control, you may see a number such as 1.00, 1.02, 1.04, or 2.00 displayed. This is an indication that the self-test is not completed. To complete the test, verify that the turbine cable is connected. Blow air into the turbine port (valve outlet) to spin the turbine. The controller will verify that the turbine works and the self-test will finish. Proceed with the initial start-up procedure.

INITIAL START-UP STEP-BY-STEP INSTRUCTIONS

For FA filter applications, please program as normal below.
See section *Programming the 700 for 5-Cycle Filter Applications*.

Step 1: Select Valve Type

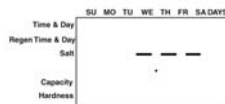
This step may have been performed by your system's OEM manufacturer.
In this case, proceed to step 3.

- Identify your valve body type by looking at the silver ID sticker on the back or side of the valve body.
- Select your valve body type using the UP and DOWN buttons.
- Display Valve Body
255 255, 7-cycle conditioner
263 Performa filter 263, 3-cycle filter
268 Performa conditioner 268, 7-cycle conditioner
273 Performa Cv 273, 3-cycle filter
278 Performa Cv 278, 5-cycle conditioner
293 Magnum Cv filter, 3-cycle filter
298 Magnum Cv conditioner, 5-cycle conditioner



NOTE: Different 742/762 control hardware is necessary to operate the 150S valve body.

Step 2: Program System Size



This step may have been performed by your system's OEM manufacturer.
In this case, proceed to step 3.



NOTE: Capacity is the result of the amount of media in the tank and the salt setting. The default capacity will be changed by selecting a different regenerant setting.

- Input system size – media volume (For FA filters, choose your closest media volume) – in cubic feet or liters.
- Use UP and DOWN buttons to scroll through resin volume choices.
- Choose the nearest volume to your actual system size.
- Press SET to accept the system size you've selected.
- If incorrect setting is programmed, see "Resetting the Control" section below.



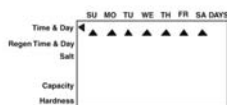
NOTE: If the controller was incorrectly set to the wrong valve body, press the DOWN button and SET button for five seconds to display resin volume in "HO". Press and hold the SET button for five seconds to reset the controller. Use the UP or DOWN buttons to increment the display to the correct valve body. Press SET.

Step 3: Program Time of Day



- While "12:00" is blinking, set the correct time of day.
- Use the UP and DOWN buttons to scroll to the correct time of day.
- "PM" is indicated, "AM" is not indicated.
- Press SET to accept the correct time of day and advance to the next parameter.

Step 4: Set Day of Week



- Press SET to make the arrow under "SU" flash.
- Use the UP and DOWN buttons to advance the arrow until it is under the correct day of week.
- Press SET to accept and advance to the next parameter.

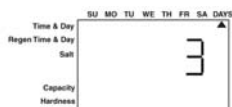
After steps 1-4, the controller will operate most systems. Proceed to step 5 if further adjustments to your system's programming is needed.

Step 5: Set Regen Time



- 2:00 (AM) is the default time of regeneration. To accept this time, press the DOWN button to move to step 6.
- To change the regen time, press SET – causing "2:00" to flash.
- Use the UP and DOWN buttons to advance to the desired regen time.
- Press SET to accept the time and advance to the next parameter.

Step 6: Set Days to Regenerate (742 Time-Clock Control Only)



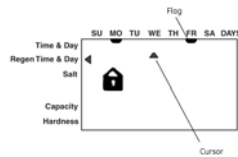
- If using 762 control – proceed to step 6a.
- Set number of days between time-clock regeneration (regen frequency).
- Default time is 3 days.
- Days can be adjusted from 1/2 (.5) to 99 days.
- To change, press SET to make the "3" flash.
- Use the UP and DOWN buttons to change the number of days desired.
- Press SET to accept the regen frequency, and advance to the next cycle.



WARNING: 742 only - Setting days between regeneration to zero will cause the system to not regenerate. This setting is used for selecting regeneration on specific days or to use with a remote regeneration input.

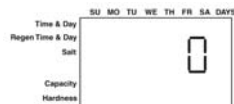
- To use the 7-day timer option - see *Dealer Installation Manual*.

Step 6a: Specific day of week regeneration (742 only)



- To change the controller to regenerate on specific days, set the number of days between regeneration to zero.
- After this has been completed, the arrow on the left side of the display will be pointing to Regeneration Time/Day. Press the SET button and the display will show a flashing cursor at the top under Sunday. The day of week can be selected when the cursor is below it.
- To toggle the day on/off, the triangular cursor must be below that day and flashing.
- The UP and DOWN buttons are used to turn the days flag on/off. If the cursor is in position but steady on push the SET button to make the cursor flash.
- To move the cursor when it is steady on, use the UP and DOWN buttons.
- To move the cursor when it is flashing, push the SET button once. This will move the cursor one position to the right and change the status to steady on.

Step 6b: Set Calendar Override (762 Demand Control Only)



- If using 742 control – proceed to step 7.
- Set number of days for calendar override on demand control.
- “0” days is the default for calendar override.
- Days can be adjusted from 1/2 (.5) to 99 days.
- To change, press SET to make the “0” flash.
- Use the UP and DOWN buttons to change to the number of days desired. Press SET to accept the regen frequency, and advance to the next cycle.

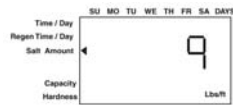
Step 7: Amount of Regenerant used per Regeneration

If the installation is a filter, skip to Filter Backwash Time. The amount of regenerant does not apply.

- Select regenerant amount.
- The default setting is 9 lbs of salt per ft³ of resin (110 grams/Liter).
- The 255 and 268 valves will follow the high efficiency settings. See Table 1

Table 1 - High Efficiency Exchange Capacity

Salt (grams/Liter)	50	60	70	80	90	100	110	120	130	140	150	170	200	230	260	290
Exchange Capacity (grams/Liter)	33.6	40.0	44.5	48.4	51.8	54.9	57.7	60.2	62.6	64.8	66.8	70.4	75.2	79.3	82.9	86.1



- To program the regenerant amount, press SET to enter the change mode. The 110 (g/l) default will begin to flash. Use UP and DOWN to scroll through the available settings. Press SET to enter the amount.

Filter backwash time (filter mode only)

If the system is set up as a filter, regenerant amount is unnecessary. The controller deactivates the regenerant amount setting, and changes to an adjustable backwash time in minutes.

- Press SET to change the time.
- The default time of 14 minutes will begin to flash.
- Use UP and DOWN to select the appropriate backwash time for the media type and amount used. The controller can use 0 to 99 minutes for backwash.
- Press SET again to enter that time.

Step 8: Estimated Capacity



- System capacity is displayed in total kilograins or kilograms of hardness removed before a regeneration is necessary.
- Value is derived from the system's resin volume input, and salt amount input.
- The capacity displayed is a suggested value – as recommended by resin manufacturers.
- Capacity is only displayed for information purposes on 742 control – it cannot be changed.
- To change capacity on 762 control, press SET to make the default capacity flash. Use the UP and DOWN buttons to increment to the desired capacity.
- Press SET to accept the setting and advance to the next parameter.
- FA filters:** see section on capacity, *Setting the 700 for 5-Cycle Filter Applications.*

If using the 742 control, programming is complete. The control will return you to the normal operation mode.



Step 9: Enter Hardness (762 Demand Control Only)

- Enter inlet water hardness at installation site.
- Default hardness setting is 25 grains (25 ppm for metric).
- To change hardness, press SET to make the setting flags. Use the UP and DOWN buttons to scroll to the correct hardness.
- Press SET to accept the entered hardness value.
- The control will return you to the normal operation mode.

- **FA filters:** see section on capacity, *Setting the 700 for 5-Cycle Filter Applications.*

Initial system programming is now complete. The control will return to normal operation mode, if a button is not pushed for 30 seconds.

Viewing Cycle Times

1. Press and hold the UP and SET buttons for 3 seconds when the control is in the "in service mode" to access the "cycle time display mode". The display will show a small "c" followed by a number in the lower portion of the display.
2. Press the UP and DOWN buttons to display the programmed cycle time.
3. Press the REGEN button to exit the "cycle times display mode".

Adjusting Cycle Times

1. Press SET when in the "cycle time display mode". The cycle time in minutes will flash, indicating the cycle time can be changed.
2. Press the UP or DOWN buttons to change the flashing time.
3. Press SET while the cycle time is flashing to enter the flashing value.



NOTE: The draw and refill cycle times cannot be changed in cycle time programming for conditioner valves. Draw and refill times are calculated using the draw and refill rates and salt amounts. The draw and refill cycle times may be programmed for 3-cycle filters.

PLACING CONDITIONER INTO OPERATION (turning on the water)

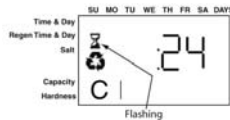
Conditioner and FA Filter Start-Up

After you have performed the previous initial power-up steps, you will need to place the conditioner into operation. Follow these steps carefully, as they differ from previous Autotrol valve instructions.



WARNING: Do not rotate the camshaft by hand or damage to the unit may occur. Use the controller to step the camshaft electronically through the cycles.

1. Remove the cover from the valve. Removing the cover will allow you to see that the camshaft is turning, and in which cycle the camshaft is currently positioned.
2. With the supply water for the system still turned off, position the bypass valve to the “not in bypass” (normal operation) position.
3. Hold the REGEN button on the controller down for 5 seconds. This will initiate a manual regeneration.



The controller will indicate that the motor is turning the camshaft to the cycle C1 (Backwash) position by flashing an hourglass. The controller will display the total regen time remaining.

If you press and hold the SET button, the controller will indicate the time remaining in the current cycle.

4. Fill the media tank with water.
 - A. While the controller is in cycle C1 (Backwash), open the water supply valve very slowly to approximately the 1/4 open position.



WARNING: If opened too rapidly or too far, media may be lost out of the tank into the valve or the plumbing. In the 1/4 open position, you should hear air slowly escaping from the valve drain line.

- B. When all of the air has been purged from the media tank (water begins to flow steadily from the drain line), open the main supply valve all of the way. This will purge the final air from the tank.
- C. Allow water to run to drain until the water runs clear from the drain line. This purges any refuse from the media bed.
- D. Turn off the water supply and let the system stand for about five minutes. This will allow any air trapped to escape from the tank.

5. Add water to the regenerant tank (initial fill) (conditioner and FA filters only).
 - A. With a bucket or hose, add approximately 4 gallons (15 liters) of water to the regenerant tank.

If the tank has a salt platform in the bottom of the tank, add water until the water level is approximately 1 inch (25 mm) above the platform.



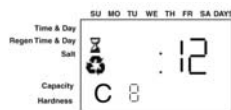
NOTE: We recommend that you do not put regenerant into the tank until after the control valve has been put into operation. With no regenerant in the tank, it is much easier to view water flow and motion in the tank.

6. Engage the refill cycle to prime the line between the regenerant tank and the valve (conditioner only).
 - A. Slowly open the main water supply valve again, to the fully open position. Be sure not to open too rapidly as that would push the media out of the media tank.
 - B. Advance the controller to the Refill (C8) position. From cycle C1 (Backwash), press and hold the SET button. This will display the current cycle.

While pressing the SET button, press UP to advance to the next cycle. Continue to advance through each cycle until you have reached cycle C8 (Refill).



NOTE: As you advance through each cycle there will be a slight delay before you can advance to the next cycle. The hourglass icon will light while the camshaft is indexing. There may be a pause at cycle C4 (System Pause). This cycle allows the water/air pressure to equalize on each side of the valve discs before moving on. The hourglass will not be visible indicating that the system is paused.



- C. With the water supply completely open, when you arrive at cycle C8 (Refill), the controller will direct water down through the line to the regenerant tank. Let the water flow through the line until all air bubbles have been purged from the line.
 - D. Do not let the water flow down the line to the tank for more than one to two minutes, or the tank may overflow.
 - E. Once the air is purged from the line, press the SET button and the UP button simultaneously to advance to cycle C0 (Treated Water) position.

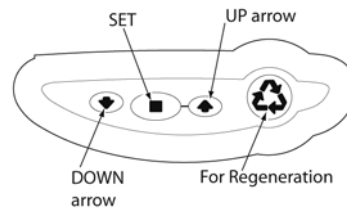
7. Draw water from the regenerant tank.
 - A. From the treated water position (cycle C0), advance the valve to the draw regenerant position. Hold the REGEN button down for five seconds.

The controller will begin a manual regen, and advance the control valve to the cycle C1 (Backwash). Press the SET and UP button to advance to cycle C2 (Draw).
 - B. With the controller in this position, check to see that the water in the regenerant tank is being drawn out of the tank. The water level in the tank should recede very slowly.
 - C. Observe the water being drawn from the regenerant tank for at least three minutes. If the water level does not recede, or goes up, check all hose connections. C2 should be displayed.
8. If the water level is receding from the regenerant tank you can then advance the controller back to the treated water (C0) position by pressing SET and the UP buttons simultaneously to advance the controller to the C0 position.
9. Finally, turn on a faucet plumbed after the water conditioner. Run the faucet until the water runs clear.

742/762 SERIES ADVANCED PROGRAMMING

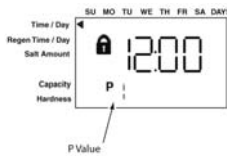
The 700 Series controllers are designed to operate by only setting the time of day and the day of the week. The remaining settings have been set at the factory. These default settings will work for most applications.

To change a setting:



Action	Key	Duration	Display
Enter basic programming	SET	Press and release	Will show time and day of week
Move to desired display	UP or DOWN arrows	Press and release	Will increment through the display
Enable setting to be changed	SET	Press and release	Display will flash
Change setting	UP or DOWN arrows	Press and release	Value changes and continues to flash
Save setting	SET	Press and release	Display stops flashing
Return to operation	REGEN	Press and release	Normal operation display
View history values	SET and DOWN	Press and hold for 5 seconds	H0 will be displayed
Level II Advanced Programming	UP and DOWN	Press and hold for 5 seconds	P1 will be displayed

742/762 LEVEL II PROFESSIONAL PROGRAMMING



The 742/762 features a special programming level that allows the installing dealer to make changes to the control for more demanding applications. The home owner/end user should never have to access this level.

To enter Level II programming press and hold UP and DOWN for 5 seconds. A "P" value will be displayed indicating Level II.

Level II menus include:

Softener Configuration

Parameter	Parameter description	Unit	Feature used in 742 for 255 268 and 278	Feature used in 762 for 255 268 and 278
P1	Time	HH:MM	Yes	Yes
P2	Day of week	Days	Yes	Yes
P3	Time of Regen	HH:MM	Yes	Yes
P4	Forced Regen Interval	Days	Yes	Yes
P5	Regen Interval (only 742)	only 742 - Days if P4 set to 0	Yes	Yes
P6	Salt amount	pounds if P9=0 ; g/l if P9=1	Yes	Yes
P7	Capacity	kilograins if P9=0 ; kg if P9=1	Yes (not modif.)	Yes (not modif.)
P8	Hardness	grains if P9=0 ; mg/L if P9=1	No	Yes
P9	Unit of measure (0=english , 1= metric)		Yes	Yes
P10	Clock mode (0=12h ; 1=24h)		Yes	Yes
P11	Service interval	Monthes	Yes	Yes
P12	Remote regen sw. Delay	s	Yes	Yes
P13	Chlorine generator (0=non, 1=salt check only, 2=generate chlorine and check salt)		Yes	Yes
P14	Refill rate	gpm x 100	Yes	Yes
P15	Brine Draw rate	gpm x 100	Yes	Yes
P16	Reserve type	0=variable reserve, Delay regen-1=Fixed reserve Delay regen-2=Variable reserve immediate regeneration,3=Fixed reserve immediate regeneration	Not used	Yes
P17	Reserve percentage for fixed reserves	%	Not used	Yes
P18	Flow sensor select	0=internal turbine, Magnum IT NHWB 1=1" Autotrol turbine, 2=2" Autotrol turb. 3=User defined K factor, 4=User defined pulse equivalent, 5=Magnum IT HWB	Not used	Yes
P19	K factor or pulse equivalent	pulses/gallon (P18=3 AND P9=0) gallons/pulse (P18=4 AND P9=0) pulses/liter (P18=3 AND P9=1) liters/pulse (P18=4 AND P9=1)	Not used Not used Not used Not used	Yes Yes Yes Yes

Filter Configuration

Level 2 Programming

Parameter	Parameter description	Unit	Feature used in 742 for 263 and 273	Feature used in 762 for 263 and 273
P1	Time	HH:MM	Yes	Yes
P2	Day of week	Days	Yes	Yes
P3	Time of Regen	HH:MM	Yes	Yes
P4	Forced Regen Interval	Days	Yes	Yes
P5	Regen Interval (only 742)	only 742 - Days if P4 set to 0	Yes	No
P6	Backwash time	Minutes	Yes	Yes
P7	Volmetric capacity	Cuft if P9=0 ; m3 if P9=1	No	Yes (not modif.)
P9	Unit of measure (0=english , 1= metric)		Yes	Yes
P10	Clock mode (0=12h ; 1=24h)		Yes	Yes
P11	Service internal	Monthes	Yes	Yes
P12	Remote regen sw. Delay	s	Yes	Yes
P13	Chlorine generator (0=non, 1=salt check only, 2=generate chlorine and check salt)		Not used	Not used
P14	Refill rate	gpm x 100	Not used	Not used
P15	Brine Draw rate	gpm x 100	Not used	Not used
P16	Reserve type	0=variable reserve, Delay regen-1=Fixed reserve Delay regen-2=Variable reserve immediate regeneration,3=Fixed reserve immediate regeneration	Not used	Yes
P17	Reserve percentage for fixed reserves	%	Not used	Yes
P18	Flow sensor select	0=internal turbine, Magnum IT NHWB 1=1" Autotrol turbine, 2=2" Autotrol turb. 3=User defined K factor, 4=User defined pulse equivalent, 5=Magnum IT HWB	Not used	Yes
P19	K factor or pulse equivalent	pulses/gallon (P18=3 AND P9=0)	Not used	Yes
		gallons/pulse (P18=4 AND P9=0)	Not used	Yes
		pulses/liter (P18=3 AND P9=1)	Not used	Yes
		liters/pulse (P18=4 AND P9=1)	Not used	Yes

Note : In level 2 programming, you can individually lock the parameters P1 to P8 by pressing the Regen button. In this case, in level 1 programming, the parameters can be viewed and a Locker symbol indicates you that the parameter can no longer be changed in level 1.

742/762 LEVEL III CYCLE TIME PROGRAMMING

Pressing and holding the Up and SET keys for 5 seconds when the control is not in regeneration will enter cycle time programming. A small “C” with a number next to it will be displayed indicating the control is in cycle time programming. The number indicates the cycle being viewed or changed. Cycle times are programmable from 0 to 200 minutes.

C1-Backwash	C5-Fast Rinse
C2-Brine Draw	C6-2nd Backwash
C3-Slow Rinse	C7-2nd Fast Rinse
C4-Re-pressurize	C8-Refill

NOTE : The 2nd Backwash and 2nd Fast Rinse cycles are not present on the 278,273,293, or 298 valves. The Re-pressurize cycle is not present on the 293, or 298 valves.

Softener Mode

The brine draw time (C2) can be viewed, but not changed in cycle time programming. The brine draw time is changed with the salt setting and the brine draw rate. The refill time (C8) can be viewed but not changed in cycle time programming. The refill time is changed with the salt setting and the refill rate in the Level 2 programming.

REMARK : on 255 & Performa, Flappers / Cam position is identical on C2 and C3. The value of cycle times stored for C2 and C3 are added so that the cam stays on position C2 / C3 during the overall length of cycles C2 and C3.

Filter Mode

All cycle times including refill and brine draw may be programmed in minutes in filter mode.

The table herebelow sums up the cycles that can be modified in Level 3 programming :

	Valve type	255		268 Performa		263		278 Performa CV		273	
		742	762	742	762	742	762	742	762	742	762
C1	Backwash 1	M	M	M	M	M	M	M	M	M	M
C2	Brine Draw	N.M.	N.M.	N.M.	N.M.	M	M	N.M.	N.M.	M	M
C3	Slow Rinse	M	M	M	M	M	M	M	M	M	M
C4	Repressurize	M	M	M	M	M	M	M	M	M	M
C5	Fast Rinse 1	M	M	M	M	M	M	M	M	M	M
C6	Backwash 2	M	M	M	M	M	M	N.A.	N.A.	N.A.	N.A.
C7	Fast Rinse 2	M	M	M	M	M	M	N.A.	N.A.	N.A.	N.A.
C8	Refill	N.M.	N.M.	N.M.	N.M.	M	M	N.M.	N.M.	M	M

M = Modifiable / N.M. = Non Modifiable / N.A. = Non Available

ACCESSING HISTORY VALUES

The 742/762 features a review level that displays the operation history of the system. This is a great troubleshooting tool for the control valve.

To access history values, press and hold SET and DOWN for five seconds to view the "H" levels.

History Values

	Description	Range	Notes
H0	Initial setting value	Cubic feet or liters	Resin Volume
H1	Days since last regeneration	0-255	
H2	Current flow rate	Depends on turbine used	762 only
H3	Water used today in gallons/m ³ since Time of Regeneration	0-131,070 gallons or 0-61,310.70 m ³	762 only
H4	Water used since last regeneration in gallons/m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H5	Total water used since reset in 100s	0-999,900 gallons or 0 - 9,999 m ³	762 only
H6	Total water used since reset in 1,000,000	4,294 x 10 ⁶ gal or 4,264 x 10 ⁴ m ³	762 only
H7	Average usage for Sunday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H8	Average usage for Monday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H9	Average usage for Tuesday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H10	Average usage for Wednesday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H11	Average usage for Thursday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H12	Average usage for Friday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H13	Average usage for Saturday in gallons or m ³	0-131,070 gallons or 0-61,310.70 m ³	762 only
H14	Average service cycle	0-255 days	762 only
H15	Peak flow rate	0 - 200 gpm or 1,000 Lpm	762 only
H16	Day and time of peak flow rat	Time and days that peak flow occurred	762 only
H17	Months since service	0-2,184 months	762 only

RESETTING THE CONTROL

To reset the control:

1. Press and hold SET and DOWN simultaneously for 5 seconds.
2. H0 and the system's set resin volume (or "F" mode) will be displayed.
3. If a history value other the "H0" is displayed, use the UP button to scroll through the settings until "H0" is displayed.
4. To reset the control, press and hold SET for 5 seconds.
5. The control will be reset to an unprogrammed state.
6. Go to "Initial Set-up" section to reprogram control.



WARNING: Resetting the control will delete all information stored in its memory, except time and day. This will require you to reprogram the control completely from the initial power-up mode.

PROGRAMMING THE 742 FOR PERFORMA FA 268 FA (5-cycle filter) APPLICATION

Manganese Greensand Systems

VALVE BODY CONFIGURATIONS

The following configurations are recommended for the below systems:

Injector: The table herebelow lists the injectors size recommended for each vessel size. Depending on the amount of Iron contained in the water, you may need to use a bigger injector than listed here below in order to decrease the cleaning of the injector frequency.

Tank Diameter	6"	7"	8"	9"	10"	12"	13-14"	16"	18"
Injector	E	F	G	H	J	K	L	M	N
Draw rate @ 50psi (gpm)	0.10	0.14	0.18	0.22	0.26	0.38	0.50	0.56	0.67
Draw rate @ 50 psi (L/min)	0.38	0.53	0.68	0.83	0.98	1.44	1.89	2.12	2.54
Slow rinse rate @ 50 psi (gpm)	0.09	0.12	0.17	0.23	0.31	0.43	0.64	0.74	1.01
Slow rinse rate @ 50 psi (L/min)	0.34	0.45	0.64	0.87	1.17	0.63	2.42	2.80	3.82

Backwash Flow control : Choose the appropriate backwash Flow control as recommended by the media manufacturer. Here below the Backwash flow controls to be used for a Backwash linear rate of 12 gpm/Sqft:

Tank Diameter (inches)	6	7	8	9	10	12	13	14	16	18
Backwash @ 12 gpm/Sqft *Suggested (29 m/h)	2 gpm	2.5 gpm	4.1 gpm	5 gpm	6 gpm	9 gpm	10 gpm	12 gpm	15 gpm	20 gpm
Backwash flow control	no 9	no 10	no 13	Ext (2)	Ext (2)	Ext (2)	Ext (2)	Ext (2)	Ext (2)	Ext (2)

(*) Suggested values only

Refill Flow control :

In Performa FA configurations, a DI cap is used instead of the Refill flow control. Make sure that a Permanganate Potassium Feeder features a Float Valve with Aircheck as well as a Flow restrictor.

Programming the Performa FA

It is recommended to make use of the the LEVEL 3 programming (cycle time programming) to program Performa FA with 742 controls.

Initialization :

	Value	Comment
Initialization (Press down arrow and Set for 5 sec., then press Set for 5 sec.)		
Valve Type 255, 268, 263, 278, 273, 298, 293	-	263
Liters entered in the initialization	L	F

Level 1 and 2 Programming, for Performa FA with 742

Press UP and DOWN arrow to enter Level 2 programming

Parameter	Parameter description	Unit	Value	Comment
P1	Time	HH:MM	Set time of day	Those values are also accessible from Level 1 programming
P2	Day of week	Days	Set day of week	
P3	Time of Regen	HH:MM	Set time of regen	
P4	Forced Regen Interval	Days	Set interval between regen	
P5	Regen Interval (only 742)	only 742 - Days if P4 set to 0	if P4 set to 0 you can set specific days of the week	
P6	Backwash Time	Minutes	20	
P9	Unit of measure (0=english , 1= metric)		1	
P10	Clock mode (0=12h ; 1=24h)		1	
P11	Service interval	Monthes	0	
P12	Remote regen sw. Delay	s	60	
P13	Chlorine generator (0=non, 1=salt check only, 2=generate chlorine and check salt)		0	Do not use with KMnO4
P14	Refill rate	gpm x 100	Not used	
P15	Brine Draw rate	gpm x 100	Not used	Brine Draw time is entered directly in level 3 program.

Level 3 Programming, for Performa FA with 742

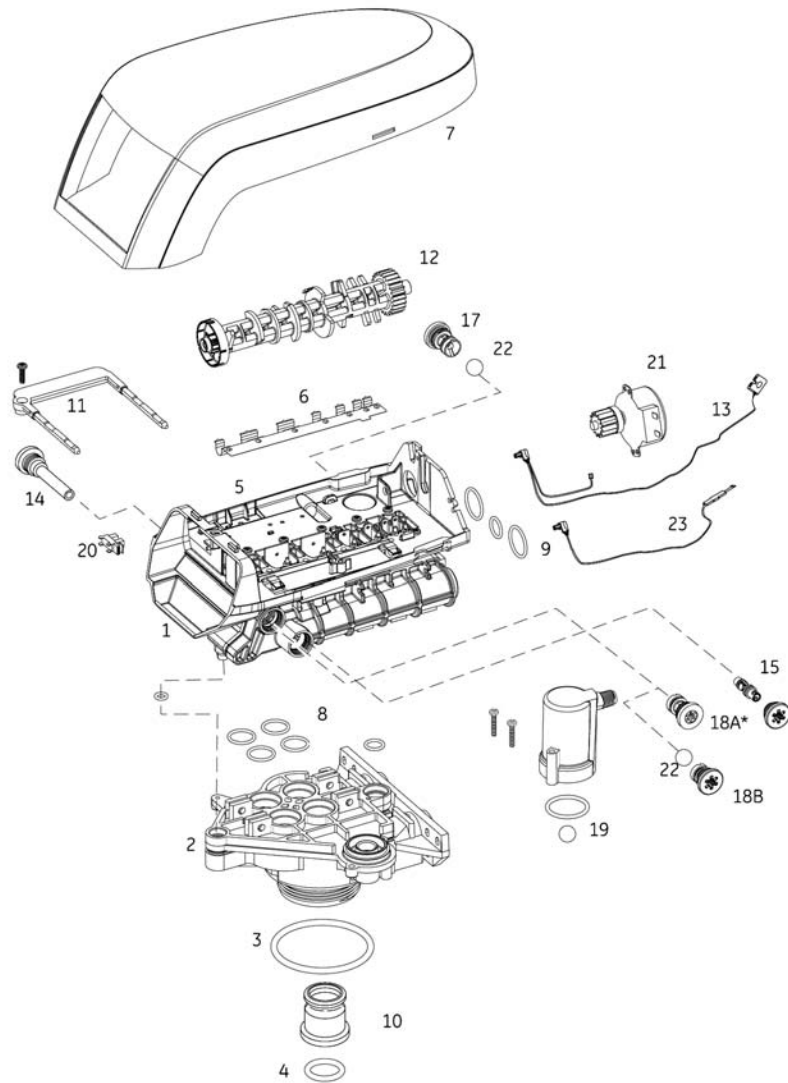
Press SET and DOWN arrow to enter Level 3 programming (Cycle Time programming)

Parameter	Parameter Descrip.	Unit	Value	Comment	Example
C1	Backwash 1 Time	Minutes	20		
C2	Brin Draw Time	Minutes	Depend on manganese Greensand quantity	Use the draw charts value or injectors curves to determine Brine draw rate then use the formula Draw time = Volume to draw (in gallons) / draw rate (gpm) OR Draw time = Volume to draw (in L) / draw rate (L/min)	Example to draw 1 gallon (3.78 L) of KMnO4 solution, with injector J @ 50 psi; Draw time = 3.78/0.98 = 4 min.
C3	Slow Rinse Time	Minutes	Depend on manganese Greensand quantity	Refer to Manganese green sand manufacturer Typ. allow minimum 3 BV slow rinse : Use the formula : Slow rinse time = (3xBV) (gallons) / slow rinse rate (gpm) OR Slow rinse time = (3xBV) (Liters) / slow rinse rate (L/min)	Exemple to rinse 25 L of media using injector J @ 50 psi; Slow rinse time = (3x25)/1.17 = 64 min.
C4	Repressurize Time	Minutes	1		
C5	Fast Rinse 1 Time	Minutes	Depend on manganese Greensand quantity	Refer to Manganese green sand manufacturer Typ. allow minimum 2 BV fast rinse : Use the formula : Fast rinse time = (2xBV) (gallons) / fast rinse rate (gpm) OR Fast rinse time = (2xBV) (Liters) / fast rinse rate (L/min)	Example to rinse 1 Cuft of media in a 10" vess. diam. with 6 gpm DLFC : Fast rinse time = 2x25 /22.5 = 3 min.
C6	Backwash 2 Time	Minutes	0		
C7	Fast Rinse 2 Time	Minutes	0		
C8	Refill Time	Minutes	9	No Refill flow control on Performa FA version	Permanganate feeder must be used (with float level control)

NOTE : 1 cuft (28 L) of Manganese Greensand is regenerated by 1 gallon of Saturated Potassium Permanganate solution

PARTS AND ACCESSORIES

255 Valve Exploded View



*Warning: Do not use flow control ball with #18A.

255 Valve Parts List

Part				Part			
Code	No.	Description	Qty.	Code	No.	Description	Qty.
1	1244650	255 Valve Assembly, w/o Flow Controls	1	16	1000269	Injector Cap with O-Ring	1
2	1033784	255 Tank Adapter New Style	1	17		Drain Control Assembly with O-Ring	1
3	1010429	O-Ring BN	1	1000209		No. 7 (1.3 gpm; 4.9 Lpm)	
4	1010428	O-Ring EP	1	1000210		No. 8 (1.7 gpm; 6.4 Lpm)	
5	1235340	Top Plate, 255 Valve, 700/860 Series Controller	1	1000211		No. 9 (2.2 gpm; 8.3 Lpm)	
6	1235341	Spring, One Piece, 255 Valve	1	1000212		No. 10 (2.7 gpm; 10.2 Lpm)	
7	1236246*	Cover, Valve, 255/Performa, 700/860 Series Controller	1	1002130		No. 12 (3.9 gpm; 14.76 Lpm)	
8	1001404	O-Ring Group: Tank Adapter	1	1000214		No. 13 (4.5 gpm; 17 Lpm)	
9	1040459	O-Ring Group: Piping Boss	1	1000215		No. 14 (5.3 gpm; 20 Lpm)	
10	1001986	13/16 inch Rubber Insert (Optional)	1	18A	1000222	Regenerant Refill Controller, No Ball, 0.33 gal.	1
*	1000250	Valve Disk Kit - Standard	1	18B	1243510	Regenerant Refill Controller	
*	1239760	Blending Valve Kit 900/700 Series Locking Bar	1	19		Air Check Kit	1
11		1031402 English Language Locking Bar		1032416		Air Check Kit 3/8-inch male	
		1031403 French Language Locking Bar		1032417		Air Check Kit 1/4-inch male	
		1031404 German Language Locking Bar		20	1235373	Module, Sensor, Photo Interrupter	1
		1031405 Italian Language Locking/Bar		21	1235361	Motor w/Spacer, Pinion, and Cable, 700 Series Controller, 12 V, 50/60 Hz	1
		1031406 Japanese Language Locking Bar		22	1030502	Ball, Flow Control	1
		1031407 Spanish Language Locking Bar		*	1033066	New to Old Style Aircheck Adapter	1
	1006093	Locking Bar Screw - No. 8-9/16 inch Camshaft Options	1	23	1235446	Turbine Cable	1
12		1235353 Cam 255/700-860 Series Valve, STD, Black		*	1233187	Motor Locking Pin	
		1236251 Cam 255/700-860 Series Valve, TWIN, Tan (insert)		*	1244336	Chlorine Generator Kit, 0.33 gpm	
13	1235269	Motor/Optical Cable Assembly, 700 Series Controller	1	*	1242411	Extension Cord for Cabinet	
14	1000226	Screen/Cap Assembly w/ O-Ring	1	*	1239711	Service Kit, Front Mount, 0.1 amp	
15		Injector (High Efficiency) Options	1	*	1239752	Service Kit, Front Mount, 5 amp	
	1035730	"E" Injector (High Efficiency) - Yellow (6-inch tank)		*	1239753	Service Kit, Top Plate Mount, 0.1 amp	
	1035731	"F" Injector (High Efficiency) - Peach (7-inch tank)		*	1239754	Service Kit, Top Plate Mount, 5 amp	
	1035732	"G" Injector (High Efficiency) - Tan (8-inch tank)					
	1035733	"H" Injector (High Efficiency) - Lt Purple (9-inch tank)					
	1035734	"J" Injector (High Efficiency) - Lt Blue (10-inch tank)					
	1035735	"K" Injector (High Efficiency) - Pink (12-inch tank)					
	1035736	"L" Injector (High Efficiency) - Orange (13 - 14-inch tank)					

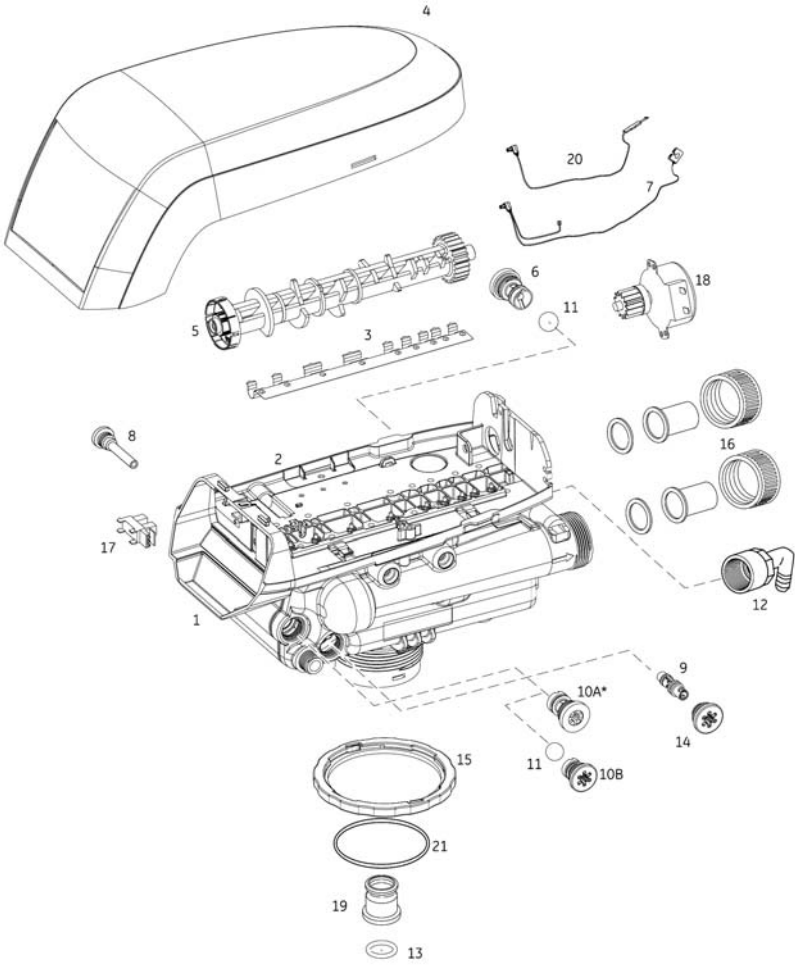
*Not Shown

255 Valve Parts List (continued)

Part				Part			
Code	No.	Description	Qty.	Code	No.	Description	Qty.
*		Piping Boss				Tube Adapter Kits	
		Piping Boss Kit (includes hardware):		* 1001606		3/4-inch Copper Tube Adapter Kit	1
1040277		3/4-inch NPT, Brass 3/8-inch NPT Drain		* 1001670		1-inch Copper Tube Adapter Kit	1
1040278		1-inch NPT, Brass 1/2-inch NPT Drain		* 1001608		22-mm Copper Tube Adapter Kit	1
1040281		3/4-inch BSPT, Brass 3/8-inch BSPT Drain		* 1001613		3/4-inch CPVC Tube Adapter Kit	1
1040282		1-inch BSPT, Brass 1/2-inch BSPT Drain		* 1001614		1-inch CPVC Tube Adapter Kit	1
1040279		3/4-inch NPT, Noryl 1/2-inch NPT Drain		* 1001615		25-mm CPVC Tube Adapter Kit	1
1040280		1-inch NPT, Noryl 1/2-inch NPT Drain		* 1001769		3/4-inch NPT Plastic Pipe Adapter Kit	1
1040283		3/4-inch BSPT, Noryl 1/2-inch BSPT Drain		* 1001603		1-inch NPT Plastic Pipe Adapter Kit	1
1040284		1-inch BSPT, Noryl 1/2-inch BSPT Drain		* 1001604		3/4-inch BSPT Plastic Pipe Adapter Kit	1
* 1040339		Piping Boss Installation Kit	1	* 1001605		1-inch BSPT Plastic Pipe Adapter Kit	1
*		Meter Adapter		* 1001611		3/4-inch BSPT Brass Pipe Adapter Kit	1
1032350		Kit, Meter Adapter	1	* 1001610		1-inch NPT Brass Pipe Adapter Kit	1
1032351		Meter Install Kit	1	* 1001612		1-inch BSPT Brass Pipe Adapter Kit	1
*		Bypass Valve					
1040769		Bypass Body Assembly with Install Kit	1				
1040524		Bypass Installation Kit	1				

*Not Shown

Performa Exploded View



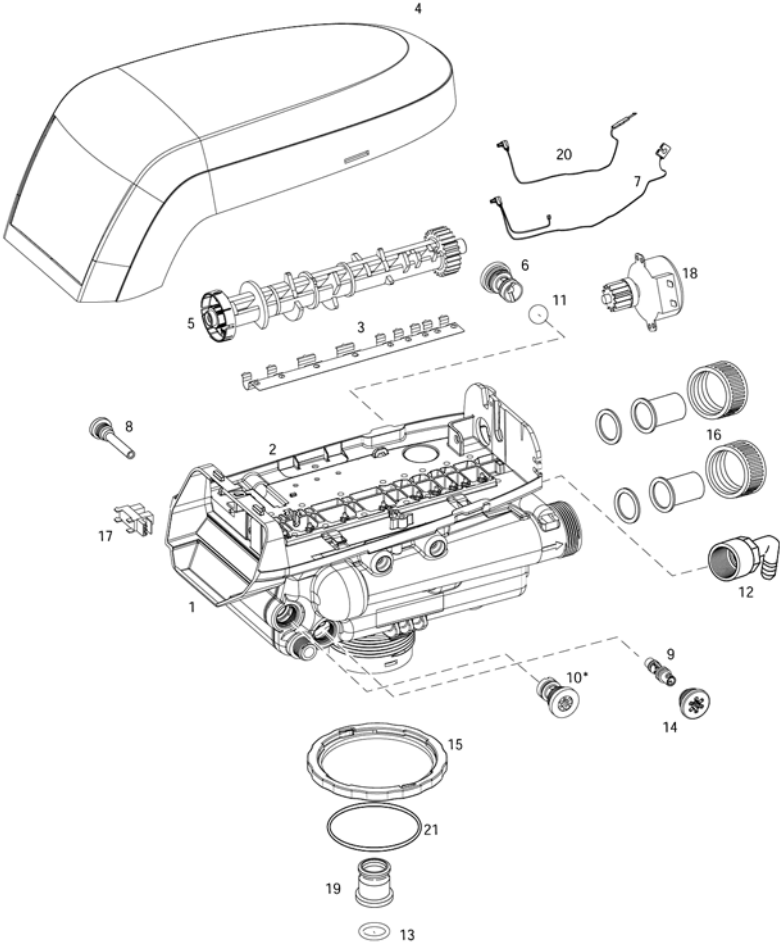
*Warning: Do not use the flow control ball with #10A.

Performa Valve Parts List

Part				Part			
Code	No.	Description	Qty.	Code	No.	Description	Qty.
1	1035807	Valve Assembly w/o Flow Controls	1	1035735	"K" Injector (High Efficiency) - Pink (12-inch tank)		
2	1235338*	Top Plate, 268/700 Series Valves	1	1035736	"L" Injector (High Efficiency) - Orange (13 & 14-inch tanks)		
3	1235339*	Valve Disc Spring, One Piece, Performa Valve	1	1032978	Plugged Injector for 263 Filter		
4	1236246*	Cover, Valve, 255/Performa 700/860 Series Controller	1	1032985	Plugged Injector Cap		
5		Performa Logix Camshafts	1	10A	1000222	Regenerant Refill Controller, No Bal, 0.33 gpm	1
	1235352*	Cam, 263-268/700-860 Series Valve, STD, Black		10B	1243510	Regenerant Refill Controller	
	1237402*	Cam, 269/700-860 Series Valve, STD, Green		11	1030502	Ball, Refill Flow Control	
	1237403*	Cam, 273/700-860 Series Valve, STD, Gray		*	1030334	Plugged Refill Flow Control - for 263 Valve	
	1237404*	Cam, 273/700-860 Series Valve, TWIN (insert)		12	1002449	Drain Fitting Elbow (3/4-inch hose barbed)	1
	1237405*	Cam, 278/700-860 Series Valve, STD, Brown		13	1010428	O-Ring	1
	1237406*	Cam, 278/700-860 Series Valve, TWIN, Tan (insert)		14	1000269	Injector Cap with O-Ring	1
6		Drain Control Assembly:	1	15	1035622	Tank Ring	1
	1000209	No. 7 (1.3 gpm; 4.9 Lpm)		*	1041174	Valve Disc Kit: Standard	
	1000210	No. 8 (1.7 gpm; 6.4 Lpm)		16		Plumbing Adapter Kits:	1
	1000211	No. 9 (2.2 gpm; 8.3 Lpm)		1001606	3/4-inch Copper Tube Adapter Kit		
	1000212	No. 10 (2.7 gpm; 10.2 Lpm)		1001670	1-inch Copper Tube Adapter Kit		
	1000213	No. 12 (3.9 gpm; 14.76 Lpm)		1001608	22-mm Copper Tube Adapter Kit		
	1000214	No. 13 (4.5 gpm; 17 Lpm)		1001613	3/4-inch CPVC Tube Adapter Kit		
	1000215	No. 14 (5.3 gpm; 20 Lpm)		1001614	1-inch CPVC Tube Adapter Kit		
*	1239760	Blending Valve Kit 900/700 Series Top Plate Drain Line Flow Control (External)	1	1001615	25-mm CPVC Tube Adapter Kit		
	1030355	Drain Line Flow Control, 5 gpm (19 Lpm)		1001769	3/4-inch NPT Plastic Pipe Adapter Kit		
	1030356	Drain Line Flow Control, 6 gpm (22.5 Lpm)		1001603	1-inch NPT Plastic Pipe Adapter Kit		
	1030357	Drain Line Flow Control, 7 gpm (26.5 Lpm)		1001604	3/4-inch BSPT Plastic Pipe Adapter Kit		
	1030358	Drain Line Flow Control, 8 gpm (30 Lpm)		1001605	1-inch BSPT Plastic Pipe Adapter Kit		
	1030359	Drain Line Flow Control, 9 gpm (34 Lpm)		1001611	3/4-inch BSPT Brass Pipe Adapter Kit		
	1030360	Drain Line Flow Control, 10 gpm (38 Lpm)		1001610	1-inch NPT Brass Pipe Adapter Kit		
7	1235269	Motor/Optical Cable Assembly, 700 Series Controller	1	1001612	1-inch BSPT Brass Pipe Adapter Kit		
8	1000226	Screen/Cap Assembly w/ O-Ring	1	17	1235373	Module, Sensor, Photo Interrupter	1
9		Injector (High Efficiency) Options		18	1235361	Motor w/Spacer & Pinion, 700 Series Controller, 12 V, 50/60 Hz	1
	1035730	"E" Injector (High Efficiency) - Yellow (6-inch tank)		19	1001986	13/16 inch Rubber Insert (Optional)	1
	1035731	"F" Injector (High Efficiency) - Peach (7-inch tank)		20	1235446	Turbine Cable	1
	1035732	"G" Injector (High Efficiency) - Tan (8-inch tank)		21	1010154	Tank O-Ring	1
	1035733	"H" Injector (High Efficiency) - Lt Purple (9-inch tank)		*	1033444	Internal Turbine Meter	
	1035734	"J" Injector (High Efficiency) - Lt Blue (10-inch tank)		*	1233187	Motor Locking Pin	
				*	1299336	Chlorine Generator Kit	
				*	1033444	Turbine Assembly	
				*	1041174	Valve Disc Kit, Standard	
				*	1239979	Cable Harness, Remote Regen 740F	
				*	1239711	Switch Kit, Front Mount, 0.1 amp	
				*	1239752	Switch Kit, Front Mount 5 amp	
				*	1239753	Switch Kit, Top Plate Mount, 0.1 amp	
				*	1239754	Switch Kit, Top Plate Mount, 5 amp	

*Not shown on drawing.

Performa Cv Exploded View



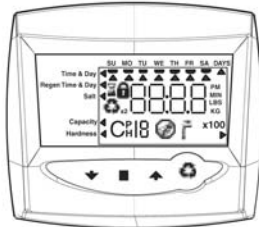
*Warning: Do not use the flow control ball with #10A.

Performa Cv Parts List

Part				Part			
Code	No.	Description	Qty.	Code	No.	Description	Qty.
1	1244652	Valve Assembly w/o Flow Controls	1	10	1000519	Regenerant Refill Controller, No Bal, 0.13 gpm	1
2	1235338	Top Plate, 268/700 Series Valves	1	1000222	Regenerant Refill Controller, No Bal, 0.33 gpm		
3	1235339	Valve Disc Spring, One Piece, Performa Valve	1	1000224	Regenerant Refill Controller, No Bal, 0.74 gpm		
4	1267806	Cover, Valve, Performa 700 Series Controller Almond	1	11	1030502	Ball, Refill Flow Control	
5		Performa Logix Camshafts	1	*	1030334	Plugged Refill Flow Control - for 263 Valve	
	1237405*	Cam, 278/700-860 Series Valve, STD, Brown	1	12	1002449	Drain Fitting Elbow (3/4-inch hose barbed)	1
6		Drain Control Assembly:	1	13	1010428	O-Ring	1
	1000209	No. 7 (1.3 gpm; 4.9 Lpm)		14	1000269	Injector Cap with O-Ring	1
	1000210	No. 8 (1.7 gpm; 6.4 Lpm)		15	1035622	Tank Ring	1
	1000211	No. 9 (2.2 gpm; 8.3 Lpm)		*	1041174	Valve Disc Kit: Standard	
	1000212	No. 10 (2.7 gpm; 10.2 Lpm)		16		Plumbing Adapter Kits:	1
	1000213	No. 12 (3.9 gpm; 14.76 Lpm)		1001606	3/4-inch Copper Tube Adapter Kit		
	1000214	No. 13 (4.5 gpm; 17 Lpm)		1001670	1-inch Copper Tube Adapter Kit		
	1000215	No. 14 (5.3 gpm; 20 Lpm)		1001608	22-mm Copper Tube Adapter Kit		
	1239760	Blending Valve Kit 900/700 Series Top Plate		1001613	3/4-inch CPVC Tube Adapter Kit		
*		Drain Line Flow Control (External)	1	1001614	1-inch CPVC Tube Adapter Kit		
	1030355	Drain Line Flow Control, 5 gpm (19 Lpm)		1001615	25-mm CPVC Tube Adapter Kit		
	1030356	Drain Line Flow Control, 6 gpm (22.5 Lpm)		1001769	3/4-inch NPT Plastic Pipe Adapter Kit		
	1030357	Drain Line Flow Control, 7 gpm (26.5 Lpm)		1001603	1-inch NPT Plastic Pipe Adapter Kit		
	1030358	Drain Line Flow Control, 8 gpm (30 Lpm)		1001604	3/4-inch BSPT Plastic Pipe Adapter Kit		
	1030359	Drain Line Flow Control, 9 gpm (34 Lpm)		1001605	1-inch BSPT Plastic Pipe Adapter Kit		
	1030360	Drain Line Flow Control, 10 gpm (38 Lpm)		1001611	3/4-inch BSPT Brass Pipe Adapter Kit		
7	1235269	Motor/Optical Cable Assembly, 700 Series Controller	1	1001610	1-inch NPT Brass Pipe Adapter Kit		
8	1000226	Screen/Cap Assembly w/ O-Ring	1	1001612	1-inch BSPT Brass Pipe Adapter Kit		
9		Injector (High Efficiency) Options		17	1235373	Module, Sensor, Photo Interrupter	1
	1035736	"L" Injector (High Efficiency) - Orange (13 & 14-inch tanks)		18	1235361	Motor w/Spacer & Pinion, 700 Series Controller, 12 V, 50/60 Hz	1
	1035737	"M" Injector - Brown 16-inch Tanks		19	1001986	13/16 inch Rubber Insert (Optional)	1
	1035738	"N" Injector - Green 18-inch Tanks		20	1235446	Turbine Cable	1
	1035884	"R" Injector - Dark Grey 21-inch Tanks		21	1010154	Tank O-Ring	1
	1032978	Plugged Injector for 273 Filter		*	1033444	Internal Turbine Meter	
	1032985	Plugged Injector Cap		*	1233187	Motor Locking Pin	
				*	1299336	Chlorine Generator Kit	
				*	1033444	Turbine Assembly	
				*	1041174	Valve Disc Kit, Standard	
				*	1239979	Cable Harness, Remote Regen 740F	
				*	1239711	Switch Kit, Front Mount, 0.1 amp	
				*	1239752	Switch Kit, Front Mount 5 amp	
				*	1239753	Switch Kit, Top Plate Mount, 0.1 amp	
				*	1239754	Switch Kit, Top Plate Mount, 5 amp	

*Not shown on drawing.

Logix 700 Serie Controllers Parts List



742/762 Control



AC Adapter



700 Control Overlays

Part				Part			
Code	No.	Description	Qty.	Code	No.	Description	Qty.
		Electronics Modules/Controllers	1			AC Adapter	
1242150		Logix 742 Controller		1000810		Japanese	
1242162		Logix 742 F Controller		1000811		North American	
1242168		Logix 762 Controller		1000812		Australian	
1242170		Logix 762F Controller		1000813		British	
		Electrical Components		1000814		European	
1235269		Motor/Optical Cable Assembly, 700 Series Control		1030234		Transformer Extension Cord 15 foot (4.5m)	
1235373		Module, Sensor, Photo Interrupter		1235448		North American Outdoor AC Adapter	
1235361		Motor w/Spacer & Pinion, 700 Series Controller 12V, 50/60 Hz				Overlays	
1244336		Refill Sensor Probe for Salt Detector Applications		1238472		Overlay, 716 Controller, English	
1256257		Remote Mount Kit		1238476		Overlay, 740C/742C Controller, English	

TROUBLESHOOTING

700 Serie Controller Troubleshooting

Problem	Possible Cause	Solution
ERR 1 is displayed	Controller power has been connected and the control is not sure of the state of the operation.	Press the UP arrow and the control should reset.
ERR 2 is displayed	Controller power does not match 50 or 60 Hz.	Disconnect and reconnect the power. If problem persists, obtain the appropriate controller or AC adapter for either 50 or 60 Hz power.
ERR 3 is displayed	Controller does not know the position of the camshaft. Camshaft should be rotating to find Home position.	Wait for two minutes for the controller to return to Home position. The hourglass should be flashing on the display indicating the motor is running.
	Camshaft is not turning during ERR 3 display.	Check that motor is connected. Verify that motor wire harness is connected to motor and controller module. Verify that optical sensor is connected and in place. Verify that motor gear has engaged cam gear. If everything is connected, try replacing in this order: <ul style="list-style-type: none"> —Wire harness —Motor —Optical sensor —Controller
	If camshaft is turning for more than five minutes to find Home position:	Verify that optical sensor is in place and connected to wire. Verify that camshaft is connected appropriately. Verify that no dirt or rubbish is clogging any of the cam slots. If motor continues to rotate indefinitely, replace the following components in this order: <ul style="list-style-type: none"> —Wire harness —Motor —Optical sensor —Controller
Four dashes displayed: -- : --	Power failure occurred	Press SET to reset the time display.

System Troubleshooting

Problem	Possible Cause	Solution
1. Brine tank overflow.	<ul style="list-style-type: none"> a. Uncontrolled brine refill flow rate. b. Air leak in brine line to air check. c. Drain control clogged with resin or other debris. 	<ul style="list-style-type: none"> a. Remove brine control to clean ball and seat. b. Check all connections in brine line for leaks. Refer to instructions. c. Clean drain control.
2. Flowing or dripping water at drain or brine line after regeneration.	<ul style="list-style-type: none"> a. Valve stem return spring weak. b. Debris is preventing valve disc from closing. 	<ul style="list-style-type: none"> a. Replace spring. (Contact dealer.) b. Remove debris.
3. Hard water leakage after regeneration.	<ul style="list-style-type: none"> a. Improper regeneration. b. Leaking of external bypass valve. c. O-ring around riser pipe damaged. d. Incorrect capacity. 	<ul style="list-style-type: none"> a. Repeat regeneration after making certain correct salt dosage was set. b. Replace bypass valve. (Contact dealer.) c. Replace O-ring. (Contact dealer.) d. Verify appropriate salt amount and system capacity. (Contact dealer.)
4. Control will not draw brine.	<ul style="list-style-type: none"> a. Low water pressure. b. Restricted drain line. c. Injector plugged. d. Injector defective. e. Valve disc 2 and/or 3 not closed. f. Air check valve prematurely closed. 	<ul style="list-style-type: none"> a. Make correct setting according to instructions. b. Remove restriction. c. Clean injector and screen. d. Replace injector and cap. (Contact dealer.) e. Remove foreign matter from disc and check disc for closing by pushing in on stem. Replace if needed. (Contact dealer.) f. Put control momentarily into brine refill, C8. Replace or repair air check if needed. (Contact dealer.)
5. Control will not regenerate automatically.	<ul style="list-style-type: none"> a. AC adapter or motor not connected. b. Defective motor. 	<ul style="list-style-type: none"> a. Connect power. b. Replace motor. (Contact dealer.)
6. Control regenerates at wrong time of day.	<ul style="list-style-type: none"> a. Controller set incorrectly. 	<ul style="list-style-type: none"> a. Correct time setting according to instructions.
7. Valve will not draw brine.	<ul style="list-style-type: none"> a. Low water pressure. b. Restricted drain line. c. Injector plugged. d. Injector defective. e. Air check valve closes prematurely on 255 valve or brine pickup tube. 	<ul style="list-style-type: none"> a. Set pump to maintain 20 psi at softener. b. Change drain to remove restriction. c. Clean injector and screen. d. Replace injector. (Contact dealer.) e. Put control momentarily into brine/slow rinse, C2. Replace or repair air check if needed. (Contact dealer.)
8. System using more or less salt than regenerant setting.	<ul style="list-style-type: none"> a. Foreign matter in valve causing incorrect flow rates. 	<ul style="list-style-type: none"> a. Remove brine control and flush out foreign matter. Advance control to brine/slow rinse, C2 to clean valve (after so doing position control to "fast rinse, C7" to remove regenerant from tank).

System Troubleshooting (continued)

9. Intermittent or irregular regenerant draw.	<ul style="list-style-type: none"> a. Low water pressure. b. Defective injector. 	<ul style="list-style-type: none"> a. Set pump to maintain 20 psi at conditioner. b. Replace injector. (Contact dealer.)
10. No conditioned water after regeneration.	<ul style="list-style-type: none"> a. No regenerant in regenerant tank. b. Injector plugged. c. Air check valve closes prematurely. 	<ul style="list-style-type: none"> a. Add regenerant to regenerant tank. b. Clean injector and screen. c. Put control momentarily into brine/slow rinse, C2. Replace or repair air check if needed. (Contact dealer.)
11. Backwashes or purges at excessively low or high rate.	<ul style="list-style-type: none"> a. Incorrect drain controller used. b. Foreign matter affecting valve operation. 	<ul style="list-style-type: none"> a. Replace with correct size controller. (Contact dealer.) b. Remove drain controller and clean ball and seat.
12. No water flow display when water is flowing on 760 controller.	<ul style="list-style-type: none"> a. Bypass valve in bypass. b. Meter probe disconnected or not fully connected to meter housing. c. Restricted meter turbine rotation due to foreign material in meter. 	<ul style="list-style-type: none"> a. Shift bypass valve to not-in-bypass position. b. Fully insert probe into meter housing. c. Remove meter housing, free up turbine and flush with clean water. Turbine should spin freely. If not, replace meter. (Contact dealer.)
13. Run out of conditioned water between regenerations.	<ul style="list-style-type: none"> a. Improper regeneration. b. Incorrect regenerant setting. c. Incorrect hardness or capacity settings. d. Water hardness has increased. e. Restricted meter turbine rotation due to foreign material in meter. 	<ul style="list-style-type: none"> a. Repeat regeneration, making certain that correct regenerant dosage is used. b. Set P6 to proper level. See salt setting chart. c. Set to correct values. See Programming section. d. Set hardness to new value. See Programming section. e. Remove meter housing, free up turbine and flush with clean water. Turbine should spin freely; if not, replace meter. (Contact dealer.)
14. Regenerant tank overflow.	<ul style="list-style-type: none"> a. Regenerant valve disc 1 being held open by foreign matter. b. Valve disc 2 not closed during regenerant draw causing brine refill. c. Air leak in regenerant line to air check. d. Improper drain control for injector. e. Drain control clogged with resin or other debris. 	<ul style="list-style-type: none"> a. Manually operate valve stem to flush away obstruction. b. Flush out foreign matter holding disc open by manually operating valve stem. c. Check all connections in regenerant line for leaks. Refer to instructions. d. Too small of a drain control with a larger injector will reduce draw rates. e. Clean drain control.



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