x m

t t r



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1.0 Installation Information

Installation Date: _____

Installation Location: _____

Installer(s): _____

Phone Number: _____

Valve Number: _____

Application Type: (Softener) (Filter) (Dealkalizer)

Water Source

(Public Well) (Private Well)

(Surface Supply)

(Other)

Water Treatment

Hardness:_____ Iron:_____

Other: _____

Tank

Capacity: _____ Flow Rates: ___min. _____max.

Tank Size: Diameter_____ Height: _____

Resin or Media Volume:_____

Resin or Media Type:_____

Brine Tank Volume: _____

Salt Setting per Regeneration:_____

Valve

Valve Type:_____

(Hard Water Bypass) (No Hard Water Bypass)

Refill Control: _____ gpm

Injector Control: _____ gpm

Backwash Control:_____ gpm

Programming

1 Time of day _____

2 Day of week _____

Time of regeneration _____

Number of days between regeneration (99 day calendar override) _____

(742 only) Day of week regeneration_____

Regeneration Day

S M T W T F S

1 2 3 4 5 6 7

Amount of regenerant used per regeneration or filter backwash time (salt setting) _____

7 System capacity _____

8 Hardness _____

9 Units of measure _____

10 Clock mode _____

11 Service interval _____

12 Remote regeneration switch delay _____

Refill sensor control (conditioner only)_____

0 = Off
1 = Salt detector only
2 = Chlorine generation

1 Refill rate (conditioner only) _____

1 Draw rate (conditioner only) _____

1 Reserve type _____

Initial average or fixed reserve_____

Flow sensor select _____

K-factor or pulse equivalent _____

Refill first option _____
(Not used for alternating option)

Remote Switch Operation _____

2.0 Introduction

The Magnum Cv™

2.1 A m t tr t t m

The control and the Magnum valve work together as an

R t t



Figure 2.6

R t tr t

1. Set the lower mount bushings into the backplate arms.
2. Then, swing top end of control face plate into position until it snaps into place.

Figure 2.7

t tr

r t r B t r

The Magnum control valve may be configured for “Hard Water Bypass” or “No Hard Water Bypass”. With Hard Water Bypass, unsoftened or unfiltered water is allowed to bypass the Magnum control valve during regeneration or backwash. With No Hard Water Bypass, a valve cartridge ensures that no unsoftened or unfiltered water bypasses the valve during regeneration or backwash.

It is easy to observe which option is installed in the valve. Note that the Hard Water Bypass End Cap has much longer standoffs than the No Hard Water Bypass cartridge. The No Hard Water Bypass assembly looks identical to the other three valve cartridges on the valve and has a label identifying the cartridge assembly (Figure 2.9).

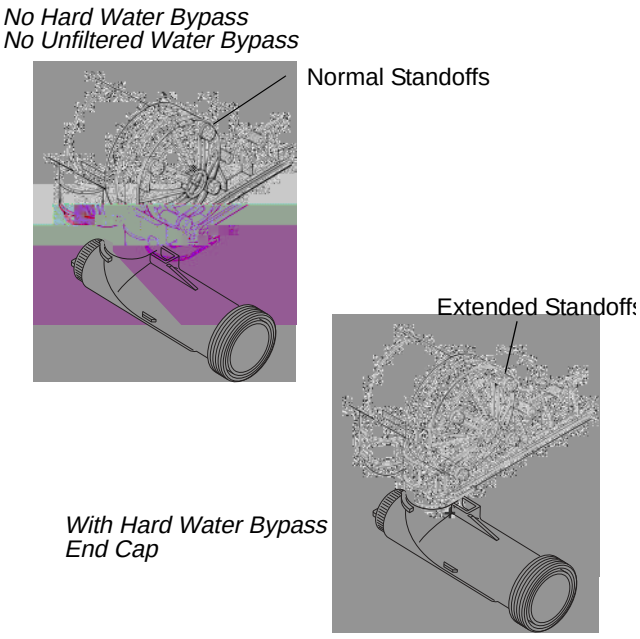


Figure 2.11

r O t t

An optional hydraulic output signal is available on the valve. An optional cam lobe on pilot valve #6 is used on the camshaft assembly to initiate the hydraulic output signal during regeneration or backwash (Figure 2.10). The hydraulic line pressure signal is available through the 1/4-inch connection on the back of the valve marked “AUX”. See Figure 2.11. Remove the tube cap installed for shipping.

Optional cam lobes available are:

P/N 1000554 Provides a hydraulic signal from the beginning of BACKWASH through the start of REFILL.

P/N 1000553 Provides a hydraulic signal from the beginning of BACKWASH through the end of REFILL.

P/N 1041064 Breakaway cam. Can be programmed to send a hydraulic signal at any time during the REGENERATION or BACKWASH cycle. Note: The camshaft must be turning for the signal to change states, i.e. switch from OFF to ON, or from ON to OFF.

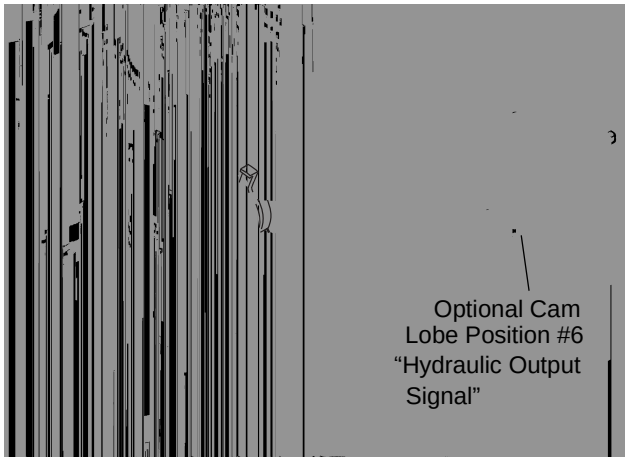


Figure 2.12

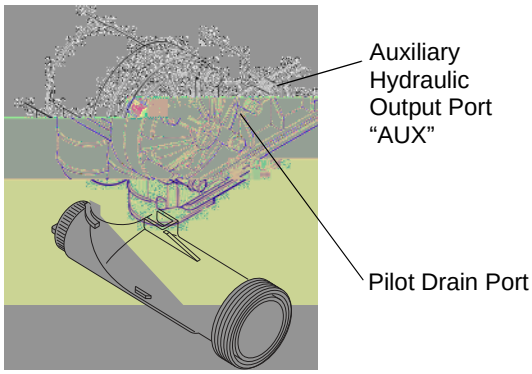
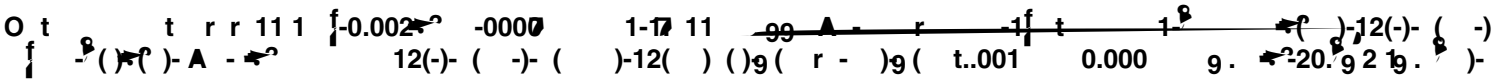


Figure 2.13

m A t r

The tank adapter on the control valve is designed to be compatible with a 4 inch-8UN (8 threads per inch) tank opening. In addition, the adapter is designed to accept a full 1-1/2-inch (3.81-cm) riser pipe with outside diameter of 1.90 to 1.91 inches (48.26 to 48.51 mm) (Figure 2.12). The riser pipe is sealed by an O-ring on the inside of the tank adapter (Figure 2.12). It is recommended that the riser pipe extend beyond the top of the tank by 1/4 inch ± 3/8 inch (6 mm ± 9 mm).

Figure 2.14



2.2 m : r f t

O r t r m t

Dynamic Pressure ..... 25 to 100 psig (172 to 688 kPa)
..... 100 psig (688kPa) maximum in Canada
Operating Water Temperature Range..... 34 to 100°F (1 to 36°C)
Ambient Temperature Range..... 34 to 120°F (1 to 50°C)
Cap Bolt Torque..... 35 to 40 inch lbs. (3.95 to 4.51 N_m)

t

Inlet and Outlet ..... 1-1/2 inch Magnum Cv
..... 2-inch Magnum IT
Tank 4-inch 8UN
Brine ..... 3/4-inch NPT
Pilot Drain and Auxiliary Hydraulic Out..... 1/4-inch tube fitting
Riser Pipe Fitting ..... 1-1/2 inch (3.81-cm)
Drain ..... 1-1/2 inch (3.81-cm)

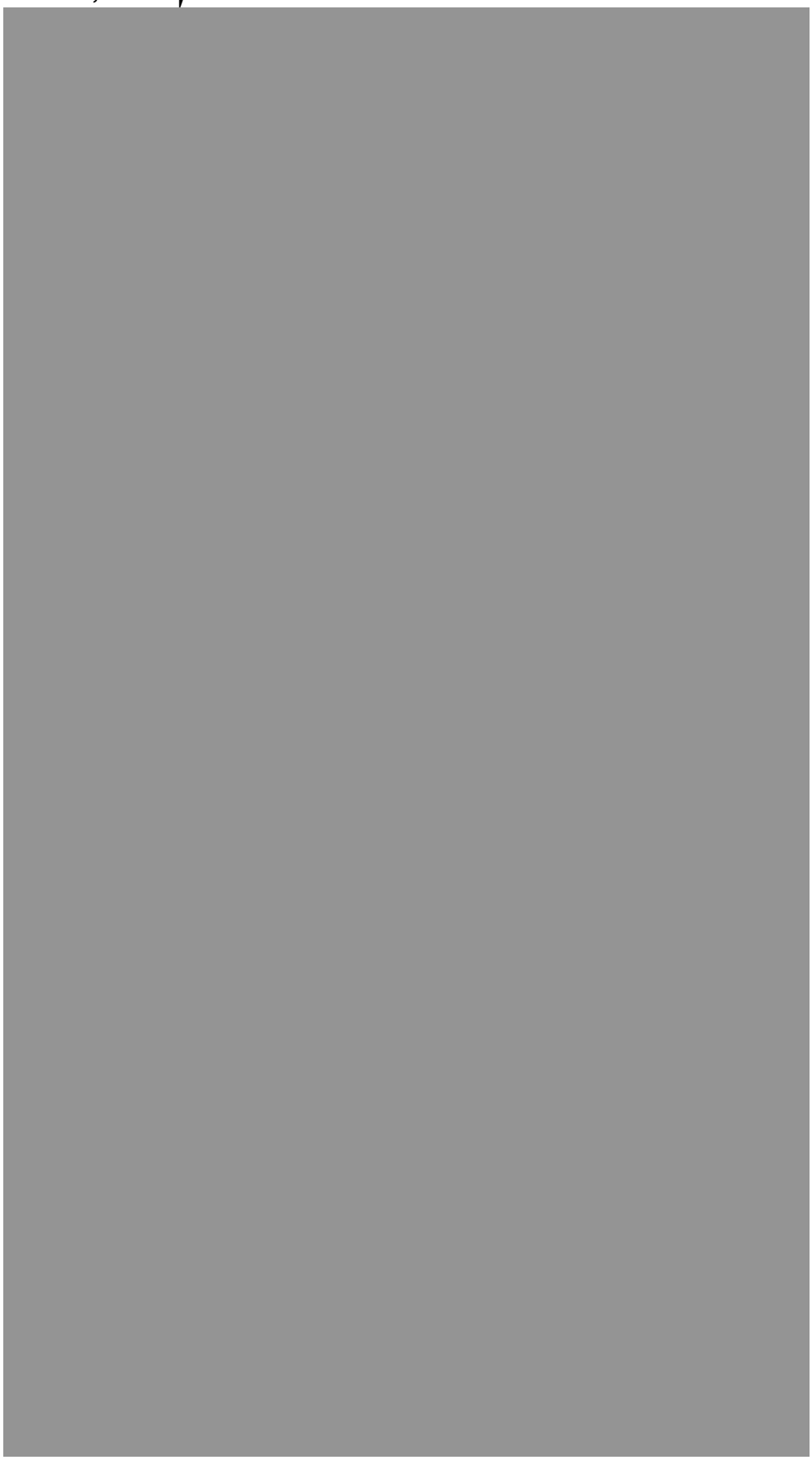
Dimensions..... Refer to drawings on pages 9 and 10
Approximate Weight (Valve and Control)..... 27 lbs. (12.3 kg.)

tr *

Voltage - Logix 742/762 Series Control ..... 12 VAC wall mount transformer only
Power Consumption ..... 4 watts

*See section on Electronic Controls for alternative electrical configurations.

2. m m f t
2- t O t t, 1 1/2- r



20.0 Water Treatment Installation

Please review the following items thoroughly to ensure an efficient and safe installation of the water treatment system. The typical installation line drawings for the Magnum valves are shown on 16.

Operating Temperature - Magnum valves are rated for cold water applications (120°F). Water pressure is not to exceed 125 psig (862 kPa). In Canada, water pressure is not to exceed 100 psig (688 kPa). Water temperature is not to exceed 100°F (36°C). Do not subject the valve to freezing conditions.

Room Layout - Allow adequate space for the water treatment system and associated piping. The Dimensions section (11) provides the overall dimensions of the control valve as well as the dimensional reference information for each of the connection ports. A minimum of 4 1/2 inches (11.5 cm) front and rear clearance is required for cartridge assembly and removal.

Plumbing - Always follow good plumbing practices and conform to local codes. Check existing pipes for lime and/or iron buildup. Replace piping if heavy buildup exists and initiate the proper treatment to prevent additional occurrences. Locate the equipment close to a drain that is capable of handling the maximum drain flow rate during backwash.

Expansion Tanks - Some tanks expand and contract over the acceptable range of operating water pressures of the Magnum control valve. The use of flexible connectors is recommended on polywound or fiberglass tank installations of 24-inch (60.96-cm) diameter and larger. Follow the tank manufacturer's instructions for more information.

Support Outlet Plumbing - Inlet and outlet plumbing should be adequately supported to avoid excessive loads on the valve. Install a manual bypass system to provide for occasions when the water conditioner must be bypassed for servicing.

Drain Line - To prevent mineral loss during backwash, and to ensure proper operation of the Magnum Cv Series control valve, A DRAIN LINE FLOW CONTROL must be plumbed into the drain line prior to placing the valve in the service mode. Flow controls from 5 to 40 gpm (18.92 to 151.4 Lpm) are available from Pentair Water and can be easily installed in the drain line. Flow controls greater than 40 gpm (151.4 Lpm) must be plumbed externally. Selection of the proper drain line flow control depends on the tank size and media used for the installation. See Section 20.2 and 20.3.

Installation of Internal Distribution System and Loading of Media into Tank

Before the installation of the internal distribution system and loading of the media into the tank, the Magnum valve must be temporarily installed onto the tank. This will ensure the correct alignment of the inlet and outlet piping once the internals are installed and the media is loaded onto the tank.

1. Cut riser 1/4-inch above the top of the tank, plus or minus 3/8 inch. Place riser inside the tank.
2. Install tank O-ring into the tank adapter. Be sure that the tank O-ring is not twisted. Lubricate O-ring with 100% silicone lubricant.
3. Screw the stainless steel tank adapter onto the empty tank until O-ring touches the top of the tank.
4. Turn (tighten) the tank adapter an additional 45° to 90° (max).
5. Slide clamp ring over tank adapter.
6. Mount valve on tank adapter until the valve uniformly contacts the tank adapter.
7. Align valve with plumbing connections to minimize unnecessary stress.
8. Remove the Magnum valve in preparation for installation of the internals and media loading.
9. Load media following your supplier's recommendations.
10. Re-mount valve on tank adapter.
11. Slide clamp ring over valve and tank adapter interface.
12. Tighten nut on clamp ring until valve cannot be turned in relation to tank adapter. The nut should be torqued to 20 to 25 ft-lbs.
13. Follow piping recommendations to provide support and flexibility. Layout piping to accommodate for tank and piping dimensional changes and potential water hammering. Flexible connectors may be needed.

Flex connectors are recommended when installing valves on FRP tanks that are 24 inches or larger in diameter.

The following general drain line piping guidelines should be observed:

- 1 inch (2.54 cm) or larger piping
- Should not exceed 20 feet (6.1 m)
- Should not be elevated higher than five feet above the control valve
- No shut-off valves should be installed in drain line
- Minimal number of elbows and fittings should be installed in drain line
- Piping must be self-supporting
- Flow control should be installed as close to the Magnum Cv Series control valve as possible if an external flow control is used.

Figure 3.1

Br t m - The Magnum control valve utilizes timed water refill to add water to the salt tank. A refill tube with check ball is required in the brine tank that

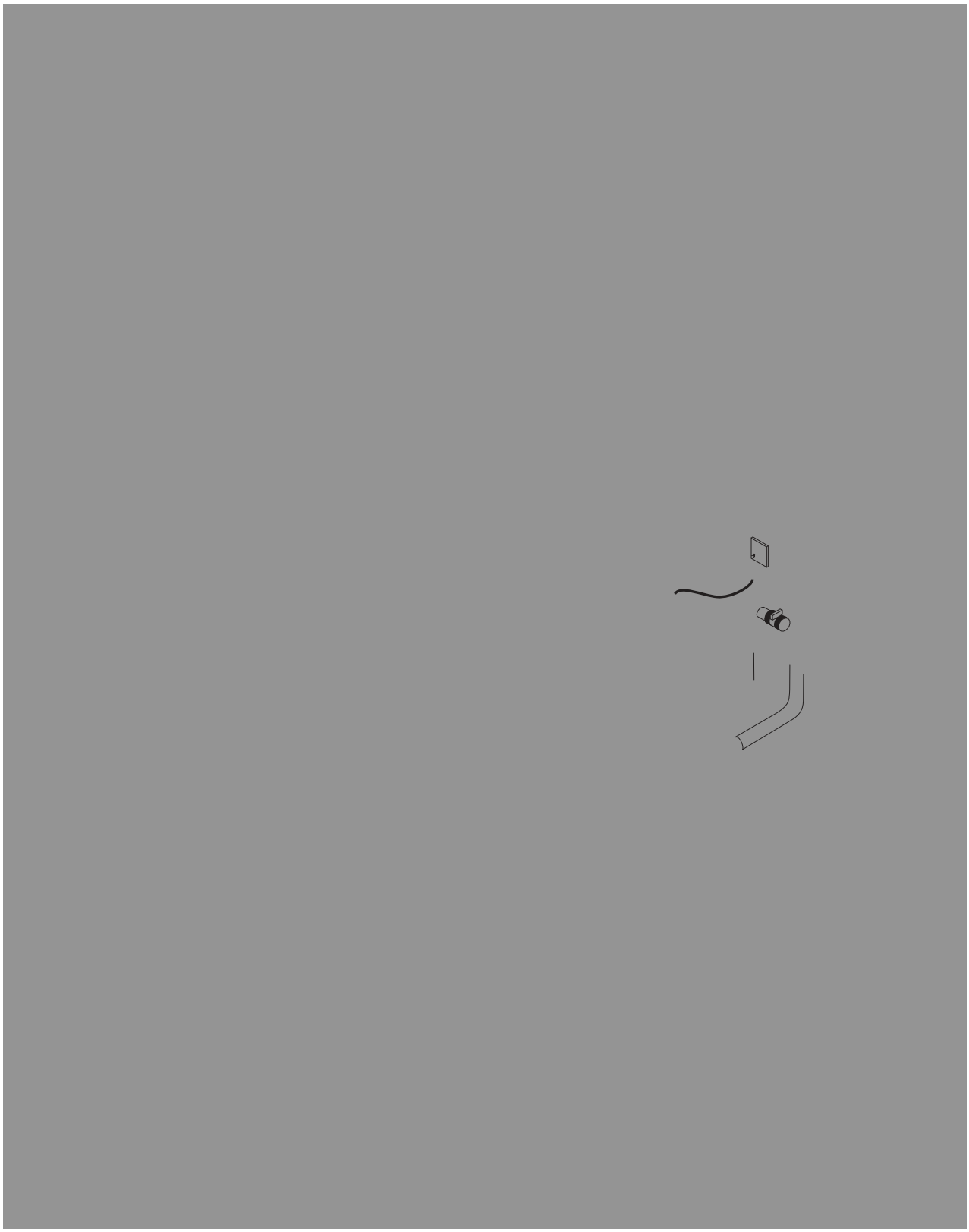


Figure 3.3 Magnum Cv and Magnum IT, Single Tank Softener Units with Logix Electronic Control

.0 r m

The Magnum control valve utilizes a series of pilot

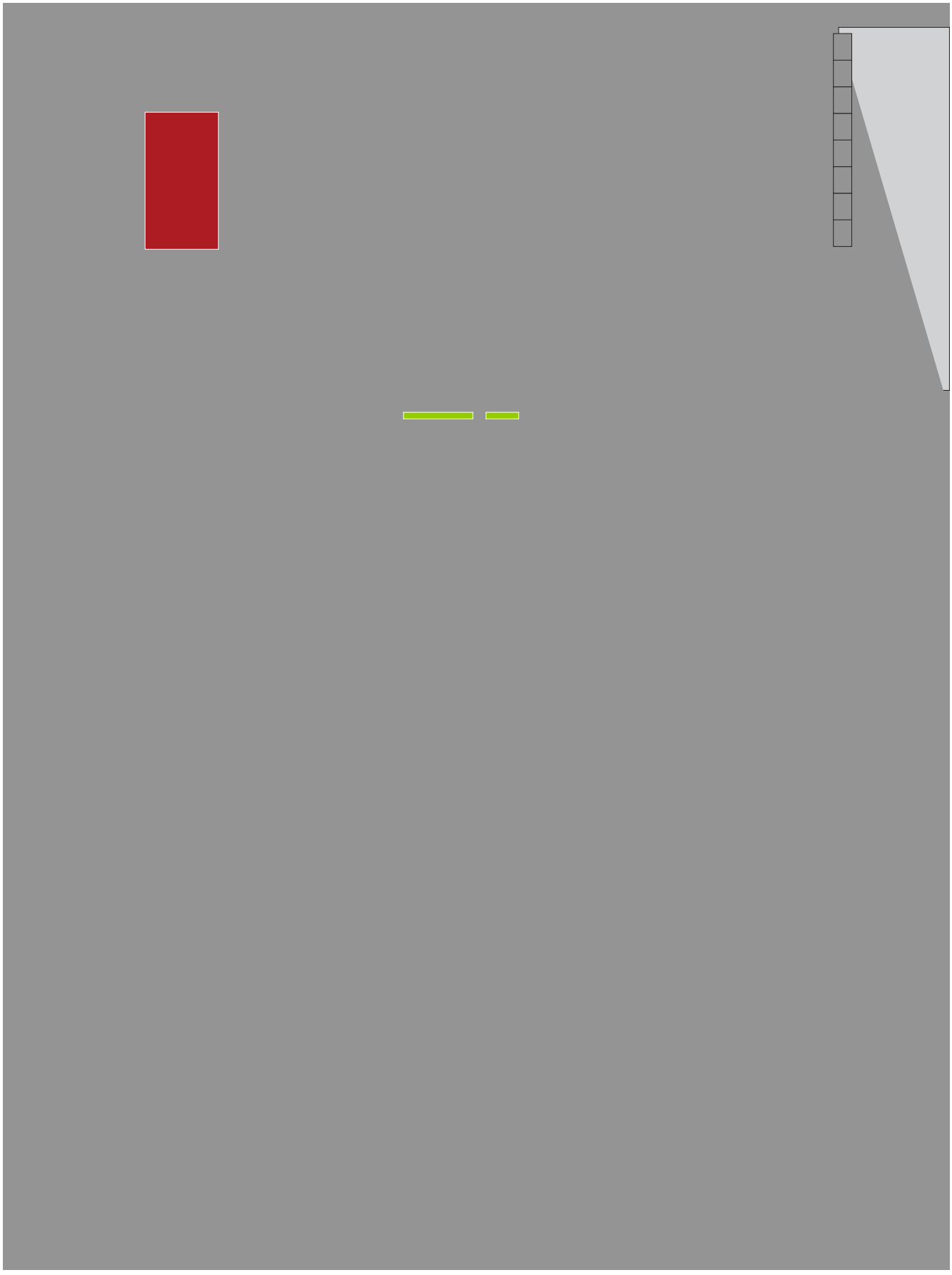


Figure 4.3

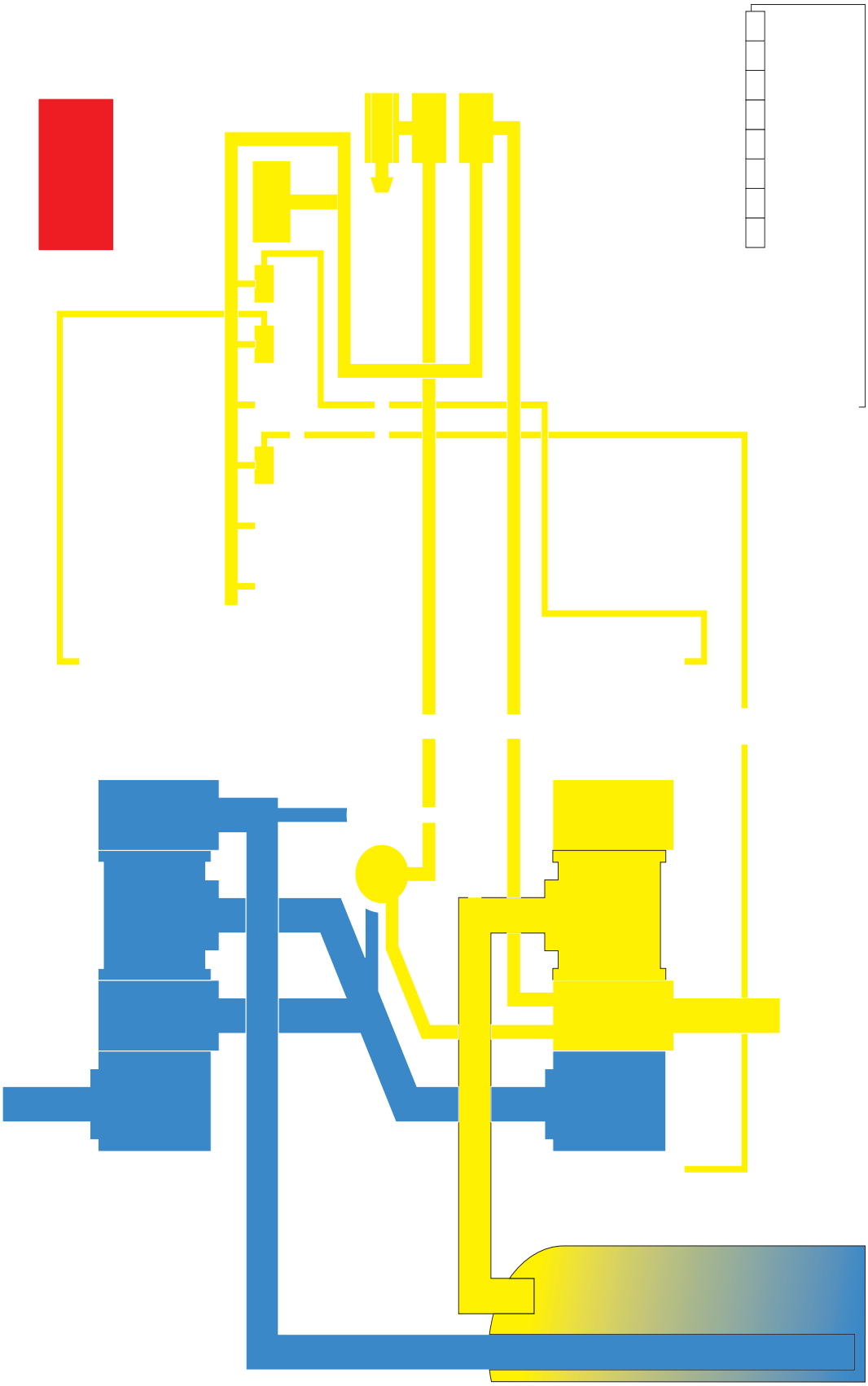


Figure 4.4

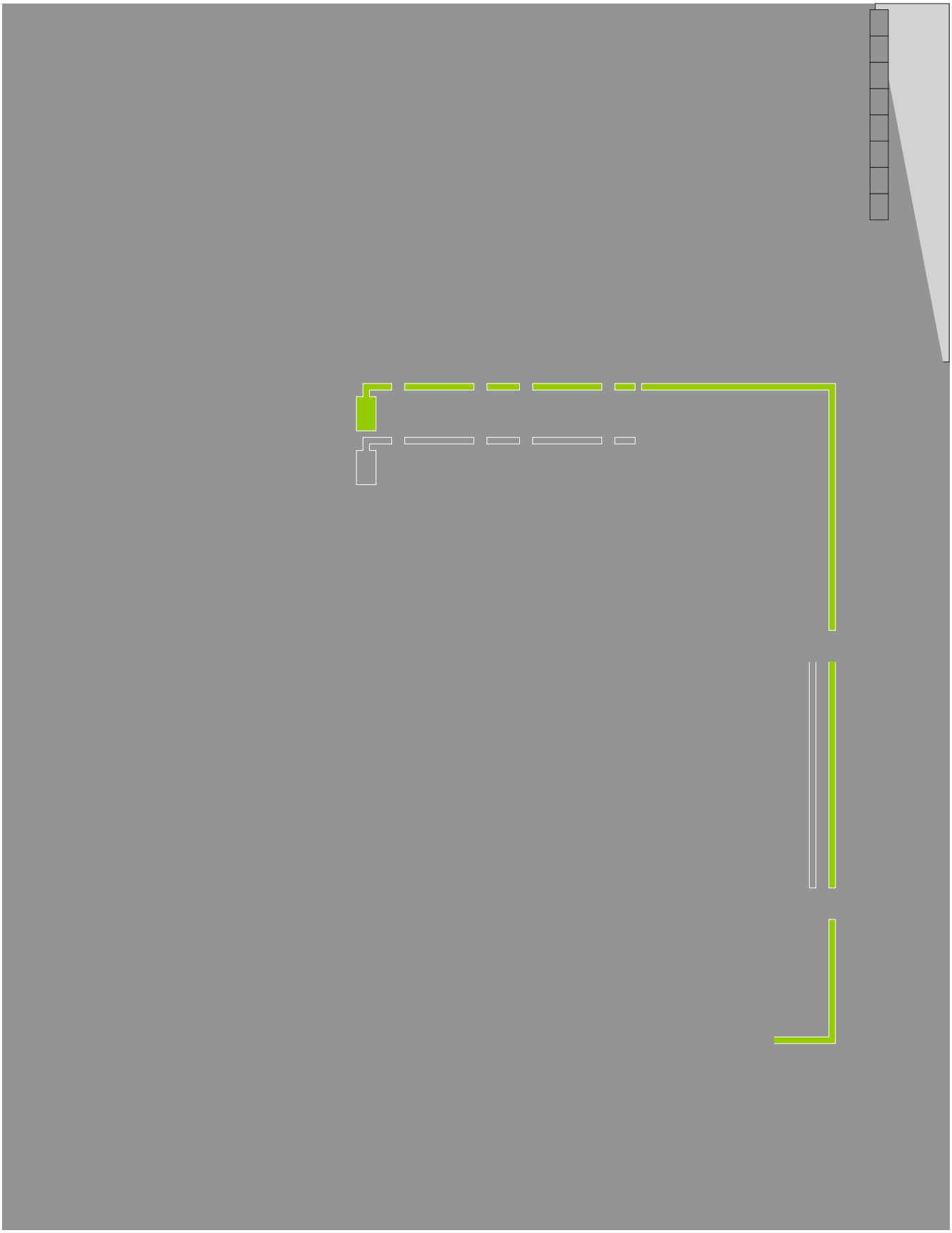


Figure 4.5

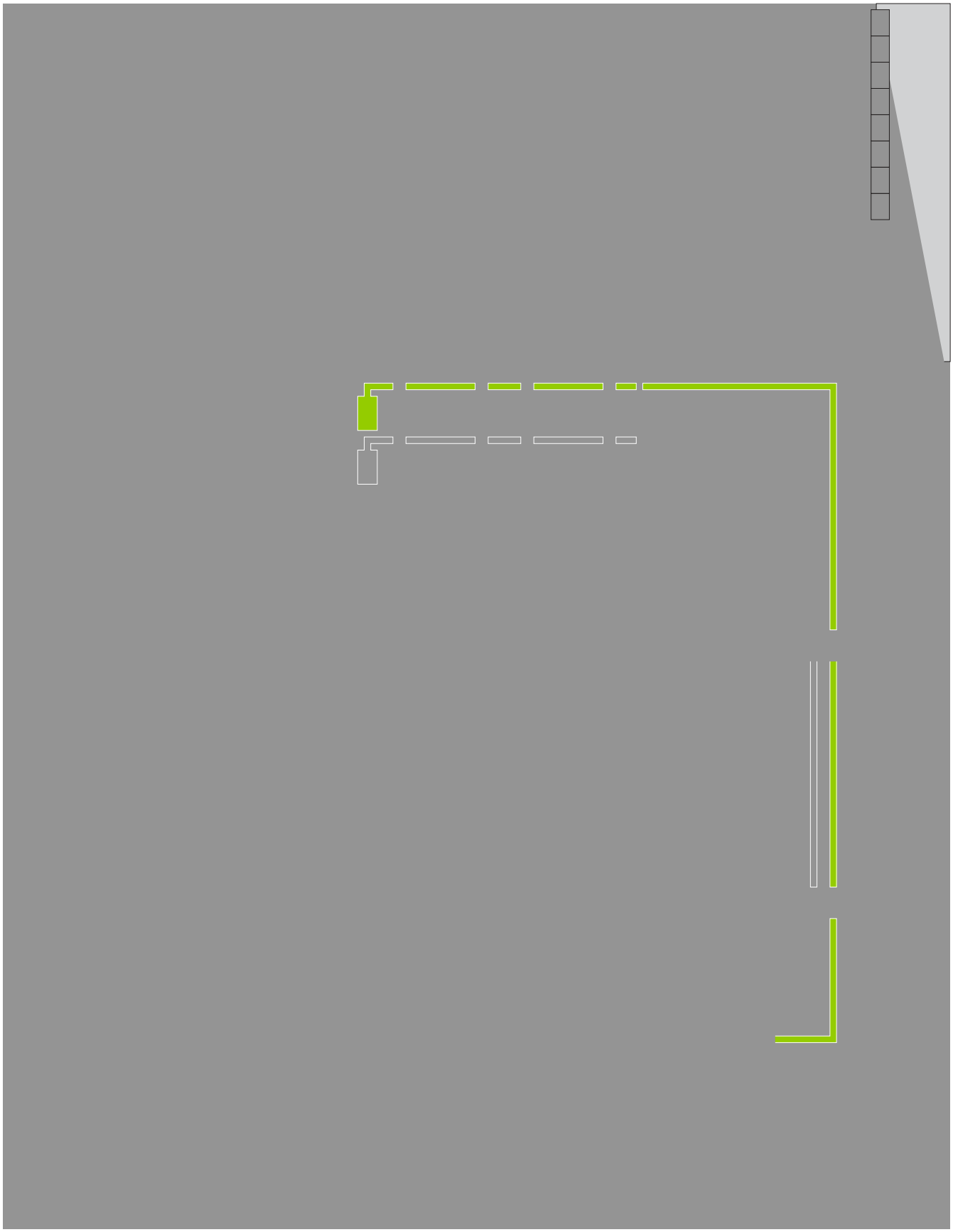


Figure 4.6

.0 tf t x tr .7 2 2 m r 7 2 2 m m

If you are unsure of your control model, simply remove the cover and disconnect the controller module from the control valve. In the back of the control valve is a silver label that shows your model number and version revision.

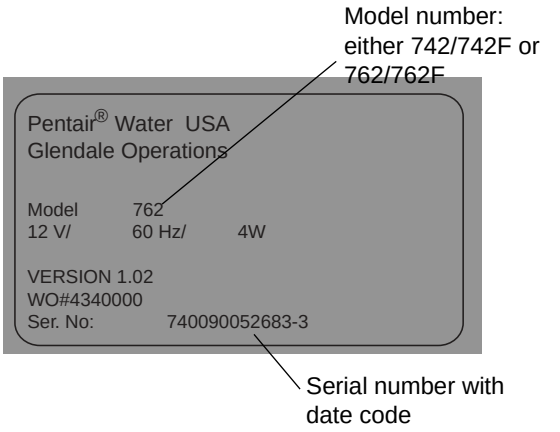


Figure 5.1

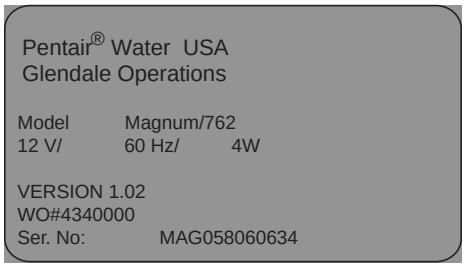


Figure 5.2

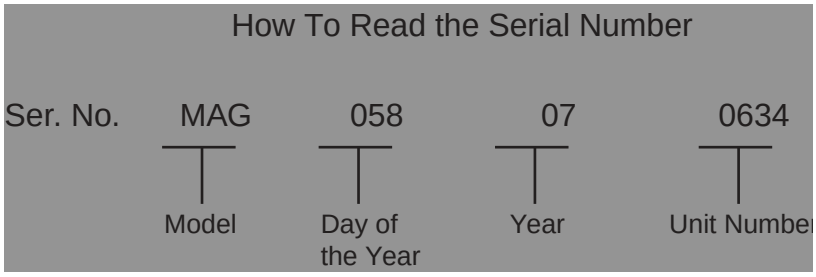


Figure 5.3

.0 ; r x r / tr t

.1 / x tr r

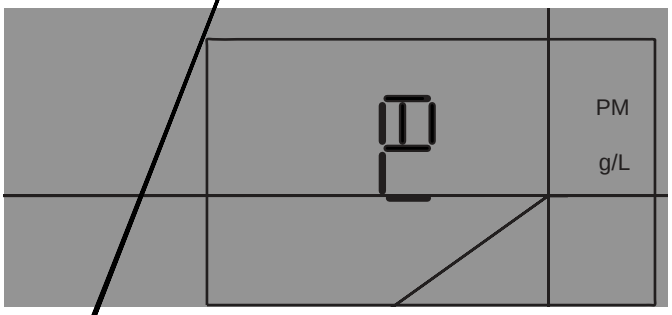


Figure 6.1

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

1. Days of the week. The flag immediately below the day appears 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 is 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 is locked (icon flashes) 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 appear next to the item that is currently displayed.

19. X100 multiplier for large values.

20. When Lbs/ft^3 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.

.2-‹ B tt



Figure 6.2

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.

r r mm t

The 700 series controller is programmed using the buttons on the keypad. The programming instructions are 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

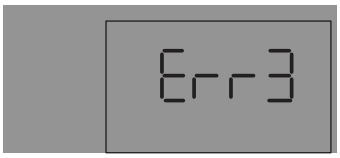
"Duration" describes how long a button is held down:

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.

7.07 27 2 r / t r-U

/ t r U



Before mounting the controller check the position of the camshaft. The correct rotation position is when the arrows on the camshaft and the arrows on the pillow block line up (see Figure 2.3).

If the arrows do not line up, rotate the camshaft by hand counterclockwise. Once the arrows line up, pull the camshaft back (see Figure 2.4).

Mount the Control

1. Mount the controller on the valve. Do not engage the camshaft.
2. Apply power to the controller. The display will show an hour glass and Err3. This is an indication that the controller is moving to the treated water (HOME position). Err3 will change and the hour glass will disappear when the cycle is complete.

NOTE: If more than two minutes elapses, verify that the motor is turning the camshaft socket. If it is not turning, contact your dealer.

3. Engage the camshaft with the controller.

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 verifies that the turbine works and the self-test finishes. Proceed with the initial start-up procedure.

8.0 Start-Up Programming

8.1 Start-Up Programming

The Logix Magnum control can be quickly programmed by following the sequential procedures on the following pages. Additional customization information is in Section 13.0 *742/762 Level II Programming*. Listed below is general information about the programming features.

Your system's OEM may have performed this setting. If so proceed to the next step.

- This setting is used to calibrate the Logix program to the actual valve type. Identification stickers on the Logix control and the valve body show the control and valve type. See Section 5.0 *Identifying the Logix Control* for more information.
- Valve models displayed by the Logix control

  255255, 7-cycle conditioner
  263Performa, 3- cycle filter
  268Performa, 5-cycle conditioner
  273Performa Cv, 3-cycle filter
  278Performa Cv, 5-cycle conditioner
  293Magnum, 3-cycle filter
  298Magnum, 5-cycle conditioner

System Size

Your system's OEM manufacturer may have performed this setting. If so, proceed to setting the Time of Day. The system size setting represents the amount of media in the tank.

Time of Day

The Time of Day is preset in the factory at 1200 pm operating as a 12-hour clock. This setting can be changed to operate as a 24-hour clock. See Section 13.0 Level II Programming.

Day of Week

Program this setting to the actual day of the week. The Logix control is then properly calibrated to allow accurate recovery of average daily water usages for each day of the week. See Section 15.0 *Accessing History Values* for more information.

Time of Regeneration or Backwash

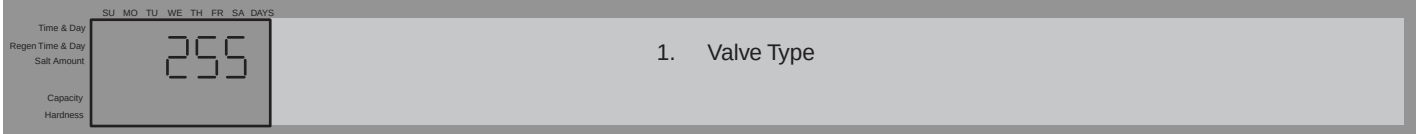
A fully adjustable clock setting allows regenerations or backwashes to be programmed at any time of the day. Also used to offset regenerations or backwashes when two systems are plumbed in series.

Days Override

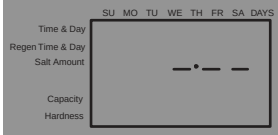
Can be used as a backup for 762 Demand systems. Represents the days between regeneration. Also can be programmed as a 7-Day clock on 742 Time clock controls (see Section 9.0).

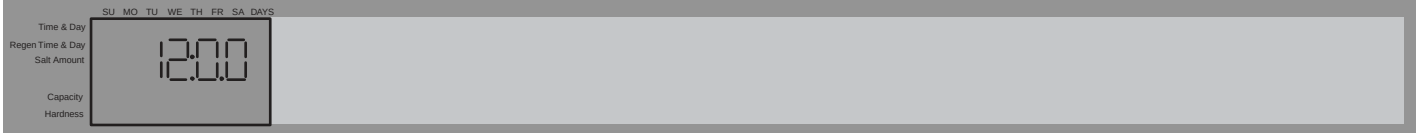
Regen Time (742 - Time Clock)

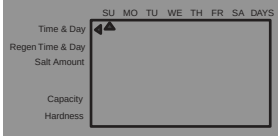
- 762/742 Conditioners: Represents salt dosage per

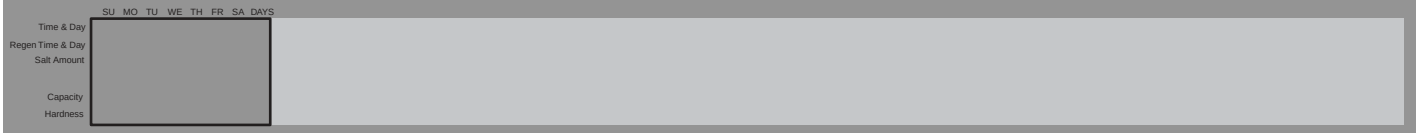

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness
255

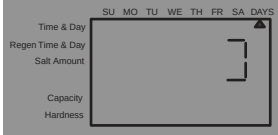
1. Valve Type

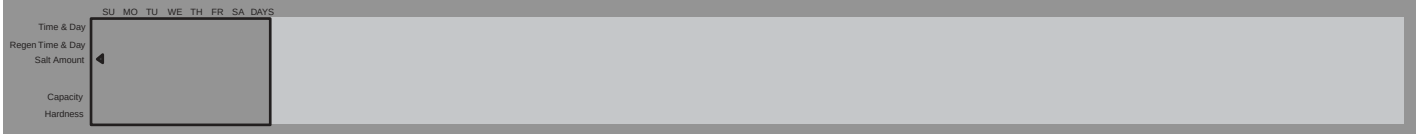

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness

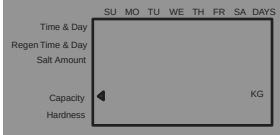

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness
12.0.0

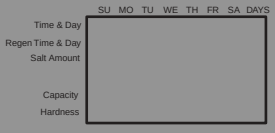

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness

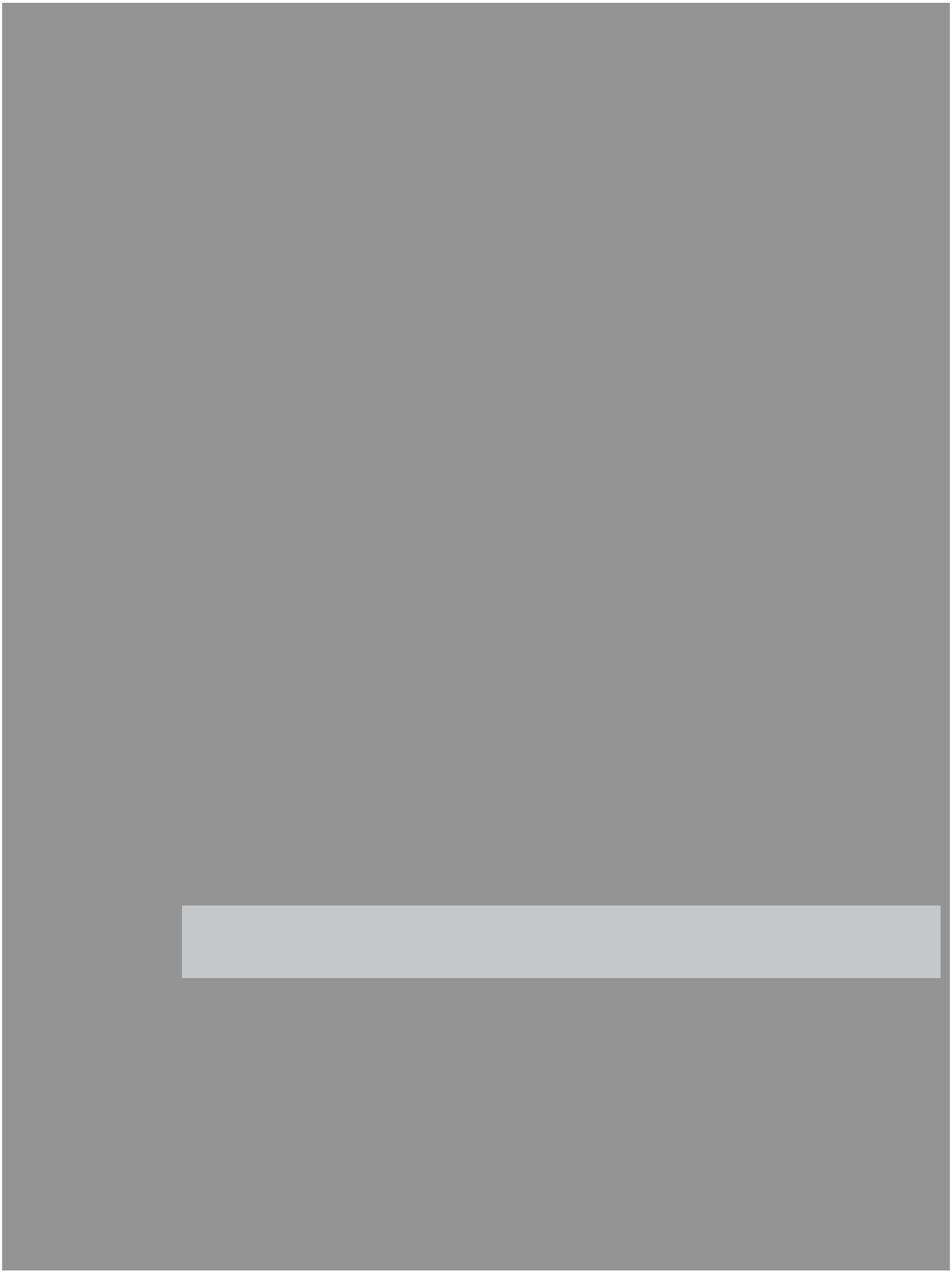

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness


SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness
1

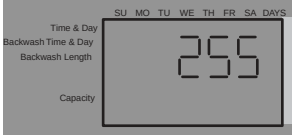
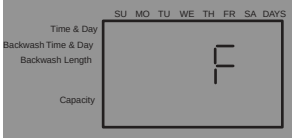
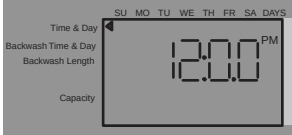
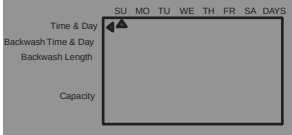
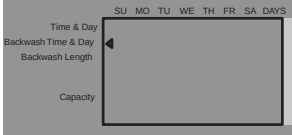
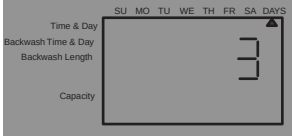
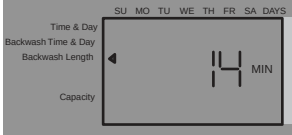

SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness


SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
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Hardness
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SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
Capacity
Hardness

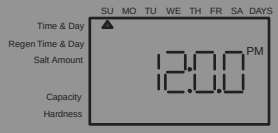


Logix Magnum Time Clock 742F/293 - 3-Cycle Filter

Screen	Buttons to Press	Description	Range
	then ▼ or ▲ press ■	1. Valve Type Select 293	
	press ■	2. Program Type Select "F"	
	press ■ then ▼ or ▲ press ■	3. Time of Day (12 hr.) Set to time of day Note: Setting includes PM indicator.	
	press ■ then ▼ or ▲ press ■	4. Day of Week Set to actual day of the week	
	press ■ then ▼ or ▲ press ■	5. Time of Backwash (12 hr) Set to desired time of backwash	
	press ■ then ▼ or ▲ press ■	6. Days Between Regeneration Set to desired days between regeneration or *Set to 0 to program as a 7-day timer	Days: .5 to 99
	press ■ then ▼ or ▲ press ■	7. Backwash Length (minutes) Set to desired backwash length	Minutes: 1 to 200

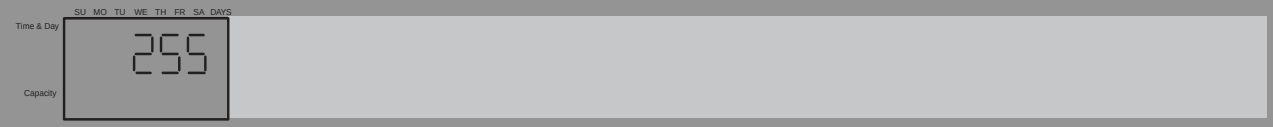
Programmming is complete

Service Display

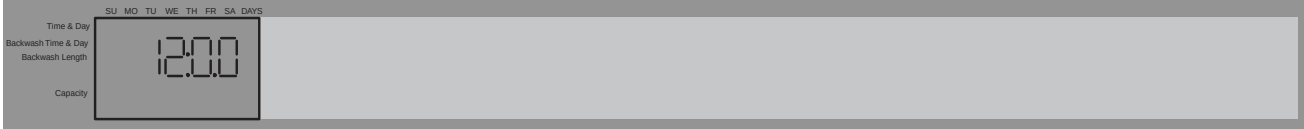


Displays actual day of week and time of day.

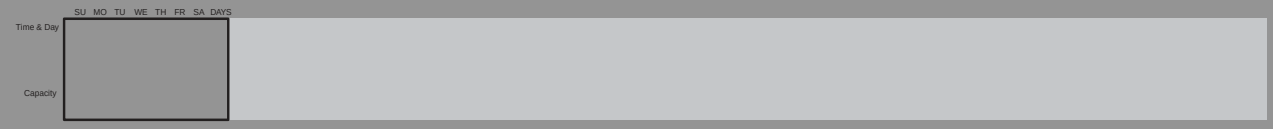
* See Section 8.2 for details.


SU MO TU WE TH FR SA DAYS
Time & Day
255
Capacity

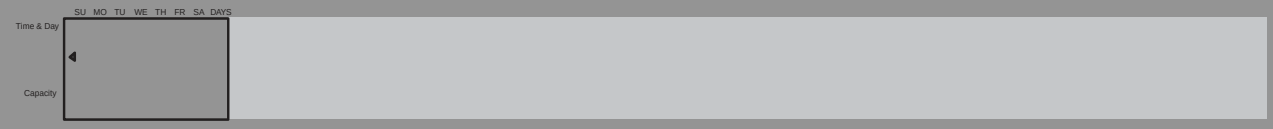

SU MO TU WE TH FR SA DAYS
Time & Day
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Backwash Time & Day
Backwash Length
12.0.0
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
0
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Capacity


SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
123
Capacity
Hardness


SU MO TU WE TH FR SA DAYS
Time & Day
Regen Time & Day
Salt Amount
0
Capacity
Hardness

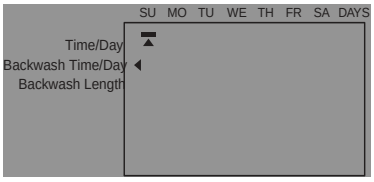
8.2 x t , tt 7 - , m

8.1 t r ff x t

t / ft	x t r / ft	t r m / t r	x t r m / t r
3	12714	50	29.9
4	15495	60	34.0
5	17774	70	37.5
6	19661	80	40.6
7	21250	90	43.4
8	22618	100	45.9
9	23828	110	48.2
10	24930	120	50.2
11	25962	130	52.1
12	26950	140	53.8
13	27916	150	55.5
14	28873	170	58.5
15	29829	200	62.7
16	30796	230	66.9
17	31783	260	71.0
18	32806	290	75.3

tt t 7 - 7 2 7 2)

- Set the Days Override to "0".
- Press SET to advance the display to the Backwash Time/Day setting.
- Press SET. A flashing cursor appears beneath the “SU” display.
- Press UP or DOWN while the cursor is flashing to program a regeneration for that day. A black bar appears below the day.



NOTE: Pressing SET again removes the black bar and deselects the day of regeneration.

- Press SET. This returns the flashing cursor to a solid cursor.
- Press UP or DOWN to navigate to other days of the week.
- Repeat the procedure to program regeneration on desired days. The days selected for regeneration are shown when the Logix control returns to the service display.

m

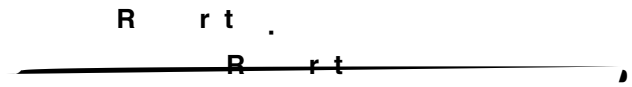
1. Press and hold the UP and SET buttons for 3 seconds when the control is in the "in service mode" to access the "cycle time display mode". The display shows a small "c" followed by a number in the lower portion of the display.
2. Press the UP and DOWN buttons to display the programmed cycle time.
3.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

NOTE: For adjusting cycle times, see *Section 14.0 Adjusting Cycle Times*.

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.

9.0 R r t

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



10.0 t r t O r t (t r t r)

t r - t r t rt-U

After you have performed the previous initial power-up steps, you need to place the conditioner into operation. Follow these steps carefully, as they differ from previous 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 allows you to see that the camshaft is turning, and in which cycle th o i12(s)-84(c)-8(pe)- prl

d. Do not let the water flow down the line to the tank for more than one to two minutes, or the tank may overfill.

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 begins a manual regen, and advances 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.

11.0 r r mm t x f r :r t m

For other regenerants, after doing the steps in Section 8.2, proceed to *Special Applications*.

:r t m

- t r

Potassium permanganate regenerating iron filters should be sized for the appropriate backwash and injector sizes.

B tr r

Be sure to choose the appropriate backwash flow rate control (see *Parts* section) as recommended by your media manufacturer.

t r

Use the same injector size as you would for your conditioner control tank diameter.

R f tr r

An FA filter can use the refill control that is featured as standard with a Logix controller. Use a float valve in your potassium permanganate feeder to set potassium permanganate dosage.

t R m tt

Programming for a manganese greensand system requires a few minor adjustments to the programming to operate the control correctly. The initial resin volume should be set to the closest volume of the manganese greensand in the system. For example, if the system contains two cubic feet of manganese greensand, program in 2.00 for the resin volume.

" t" tt f r< O R r t

Be sure to set the salt dosage high enough to operate the float shut-off in the regenerant storage tank.

All other settings remain the same as mentioned in the previous programming sections.

B t R r t tt 7 2)

To set the days between regenerations, consult the media manufacturer for the actual capacity of the media.

In general, manganese greensand has a capacity of 10,000 ppm of removal capability per cubic foot of media. Calculate the capacity of the system by taking the number of cubic feet of media and multiply by 10,000.

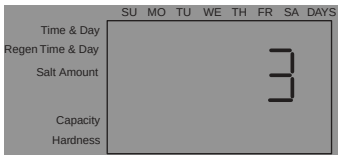
For example, using a 1 cubic foot system provides 10,000 ppm of removal capability.

The next step is to calculate the demand for the system. Multiply the predicted daily water usage by the iron content in ppm.

For example, an average person uses 75 gallons of water per day. Four people living in a home use 300 gallons of water (75 gallons x 4 people) per day. Assume the incoming water has 10 ppm of iron. Now calculate the daily demand: multiply the gallons of water

00) b tty.

2. Set your hardness to the level of ppm iron in your water. If you have 3 ppm of iron, set the 762 control to "3".



3. The control calculates the remaining volume capacity in gallons (m^3) and counts down to regeneration.

11.1 A t f- t r r m t 7 27 2

For all special flow applications that are media or regenerant dependent, you are going to select the injector, the backwash flow control and the refill flow control.

You may need to change one or all the regenerating cycle times to satisfy your equipment needs.

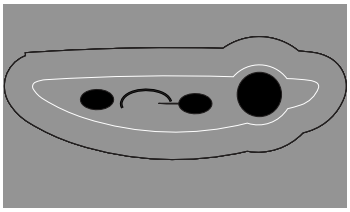
The Logix control must be programmed as a 3-cycle filter to allow all cycles to be adjustable. See pages 27 or 28 to program the Logix Magnum as a 3-cycle filter. Proceed to the procedure listed below after completing filter programming.

r r m m r A

- Press nand Q when in the "Service Mode" to enter the Cycle Time Display mode. The display will show "C1".
- Press Q when in the "Cycle Time Display" mode. The cycle time in minutes will flash, indicating the cycle time can be changed.
- Press por nto change the flashing time.
- Press Q to enter the selected time.
- Press nto navigate to another cycle.

12.0 t t

The Logix 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 work for most applications.



To change a setting refer to Table 13.1.

- 1-.1

A t	-<	r t	
Enter basic programming	SET	Press and Release	Shows time and day of week
Move to desired display	UP or DOWN arrows	Press and Release	Increments through the displays
Enable setting to be changed	SET	Press and Release	Display flashes
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	HO is displayed
Level II Advanced Programming	UP and DOWN	Press and Hold for 5 seconds	P1 is displayed

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 is displayed indicating Level II.

Level II menus include:

P1 = Time of day

P2 = Day of week

P3 = Time of regeneration

P4 = Number of days between regeneration (99 day calendar override)

P5 = Not used (742 only)

P6 = Amount of regenerant used per regeneration or filter backwash time (salt setting)

P7 = System capacity

P8 = Hardness

P9 = Units of measure

P10 = Clock mode

P11 = Service interval

P12 = Remote regeneration switch delay

P13 = Refill sensor control (conditioner only)

0 = Off
1 = Salt detector only
2 = Chlorine generation
P14 = Refill rate (conditioner only)

P15 = Draw rate (conditioner only)

P16 = Reserve type

P17 = Initial average or fixed reserve

P18 = Flow sensor select

P19 = K-factor or pulse equivalent

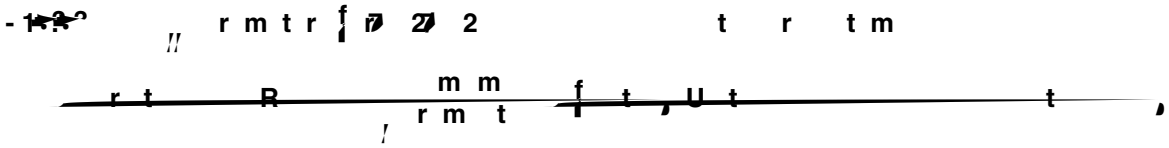
Pr = Refill first (not used for alternating mode)

Pd = Remote switch operation

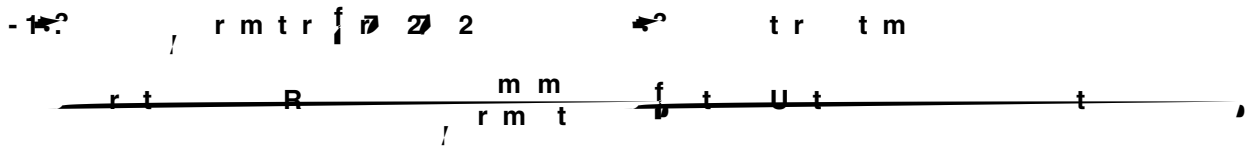
See the Logix Professional dealers manual for further details on setting Level II parameters.

P1	Time of Day	1:00 - 12:59 AM or PM 0:00 - 23:59	1 minute	12:00 PM	hour: minute	Range depends on value selected for P10
P2	Day of Week	N/A	1 day	None	N/A	Uses arrows under days of week on overlay.
P3	Time of Regeneration	1:00 - 12:59 AM or PM 0:00 - 23:59	1 minute	2:00 AM	hour: minute	Range depends on value selected for P10
P4	Calendar Override	0-99	1	3	days	0 = no calendar override, .5 = regeneration twice a day at time of regeneration and 12 hours later. Calendar Override skipped if at least one Day of Regeneration selected. Can be locked out of changes in Level 1 programming
P5	Day of Week Regeneration	N/A	1 day	None	N/A	Uses bars under days of week on overlay. Day of Week Regeneration is skipped if calendar override is more than zero. 742 only.
P6	Salt Setting	3-18 50-290	1 varies	9 110	lbs/Ft^3 grams/liter	Unit of measure depends on value in P9
P7	Capacity of unit (demand only)	1-900 .1-90.0	1 .1	(1)	kilograins kilograms	Unit of measure depends on value selected for P9.
P8	Hardness of water	3-200 30-2000	1 10	25 400	grains per gallon grams per liter	Unit of measure depends on value selected for P9. 762 mode only.

Notes: (1) Calculated depending on salt setting and resin volume. Capacity may be manually adjusted.



P9	Units of measure	0-1	1	(2)		0 = US, 1 = Metric
P10	Clock mode	0-1	1	(2)		0 = 12 hour clock; flow rate service display 1 = 24 hour clock; flow rate service display 2 = 12 hour clock; Time of Day service display 3 = 24 hour clock; Time of Day service display
P11	Service Interval	0-250	1	0	months	Uses 30 days for each month.
P12	Remote Regeneration	3-250	1	0	months	Time remote switch must be active to start regeneration on 742 time clock units.
P13	Not used on Magnum Valves					
P14	Refill Rate	1-700	1	(1)	gpm x 100	



P1	Time of Day	1:00 - 12:59 AM or PM 0:00 - 23:59	1 minute	12:00 PM	hour: minute	Range depends on value selected for P10
P2	Day of Week	N/A	1 day	None	N/A	Uses arrows under days of week on overlay.
P3	Time of Regeneration	1:00 - 12:59 AM or PM 0:00 - 23:59	1 minute	2:00 AM	hour: minute	Range depends on value selected for P10
P4	Calendar Override	0-99	1	3	days	0 = no calendar override, .5 = regeneration twice a day at time of regeneration and 12 hours latter. Calendar Override skipped if at least one Day of Regeneration selected. Can be locked out of changes in Level 1 programming
P5	Day of Week Regeneration	N/A	1 day	None	N/A	Uses bars under days of week on overlay. Day of Week Regeneration is skipped if calendar override is more than zero. 742 only.
P6						

P9	Units of measure	0-1	1	(2)		0 = US, 1 = Metric
P10	Clock mode	0-1	1	(2)		0 = 12 hour clock; flow rate service display 1 = 24 hour clock; flow rate service display 2 = 12 hour clock; Time of Day service display 3 = 24 hour clock; Time of Day service display
P11	Service Interval	0-250	1	0	months	Uses 30 days for each month.
P12	Remote Regeneration	3-250	1	60	seconds	Time remote switch must be active to start regeneration on 742 time clock units.
P13	Skipped					
P14	Skipped					
P15	Skipped					
P16 (3)	Reserve Type (demand only)	0-3	1	0		0 = Variable reserve delayed regeneration 1 = Fixed reserve delayed regeneration 2 = Variable reserve immediate regeneration 3 = Fixed reserve immediate regeneration
P17 (3)	Initial average or fixed reserve (demand only)	0-70	1	30	% of Capacity	Depends on value entered in P16
P18 (3)	Flow sensor select (demand only)	0-7	1	(1)		0 = Internal magnum NHWB, 1=1” Autotrol turbine, 2=2” Autotrol turbine, 3=User define K-Factor, 4=User defined Pulse Equivalent, 5=Internal Magnum HWB
P19 (3)	K-Factor or Pulse Equivalent	1.00-99.99 0-9999	0.01 1	0.01 1		K-Factor P18=3; Pulse Equivalent P18-4
Pr	Refill First (not used for alternating mode)	0-1	1	0		0 = Refill first off 1 = Refill first on
Pd	Remote switch operation (742 only)	0-1	1	0		0 = Immediate Regeneration after P12 time 1 = Delayed Regeneration after P12 time

Notes: (1) Default selected with valve type and resin volume.
(2) Factory Default is "0" for North America units and "1" for World units.
(3) P16 through P19 skipped on 742 time clock units.

1 .0 m r r mm

Cycle times may be viewed by pressing and v88ngthbegSEdTCy ciheny cl isighby -12“i29(810(se810(r)48v)148(c)148e m

10.0 History

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

Reset

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) is displayed.
3. If a history value other the "H0" is displayed, use the UP button to scroll through the settings until "H0" is displayed.

7.0 r t

7.1 r t . x tr r

r m		t
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: —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: —Wire harness —Motor —Optical sensor —Controller
Four dashes displayed: — — : — —	Power failure of more than 8 hours has occurred	Press SET to reset the time display.

7.2 r t . m /

m t m		t
1. Water conditioner fails to regenerate. No soft water.	a. Power supply to Magnum control has been interrupted.	a. Determine reason for power interruption and correct. Reset time of day.
	b. Water pressure lost.	b. Restore water pressure.
	c. Logix control improperly programmed.	c. Verify that the Logix control is properly programmed.
	d. Defective control.	d. Replace control assembly.
	e. No salt in brine tank.	e. Add salt and regenerate.
	f. Manual bypass valve is open.	f. Close manual bypass valve.
	g. For 762 series control, turbine meter is clogged or restricted.	g. Inspect turbine meter assembly, clean or replace.
	h. Leak at riser pipe seal.	h. Ensure that riser pipe is properly sealed at tank adapter O-ring. Inspect pipe for cracks.
	i. Insufficient brine.	i. Check refill control and clean if necessary. Check control settings. Check flow rate capabilities of safety float and air check assembly.
	j. Plugged injector or injector screen.	j. Inspect and clean injector and/or injector screen.
2. No Brine Draw.	a. Plugged injector or injector screen.	a. Inspect and clean injector and/or injector screen.
	b. Insufficient water pressure.	b. Increase water pressure above 25 psig (172 kPa) minimum.
	c. Obstructed drain line.	c. Remove obstruction.
	d. Brine line pulling air.	d. Ensure all brine line fittings are tight.
3. Insufficient brine draw.	a. Partially clogged injector or injector screen.	a. Inspect and clean injector and/or injector screen assembly.
	b. Restricted flow rate in brine line.	b. Check flow rate capabilities of the safety float/ aircheck assembly.
	c. Insufficient water pressure.	c. Increase water pressure above 25 psig (172kPa) minimum.
	d. Excessive back pressure on injector due to elevated drain line.	d. Reduce drain line elevation to height of valve.
	e. Partially restricted drain line.	e. Remove restriction.
4. Insufficient Refill to Brine Tank.	a. Restricted flow rate in brine line.	
	b. Resin volume.rec-910(l)-11 s7(e)-1(c-91en.)]TJ0.003 Tc -0.001 Tw 20.2210.667 Td[a.)-123Che(i)12(c410(k) ai12(r)-c(s)-1h5(e)-14(cs)-11(as)-1s5(e)-10(mb)214(l6)46(.)]TJ0.2965 Tc 0 Tw -2.08 -1.44 Td[b.)-1319(R)5pro(i)12(g)-ram	

a.su4(a(in)1lmi)13etyflo.b.eiginyrdr(f)13(inj)12(ec)10(t)2(o(.)]TJ0.0365 Tc 0 Tw 2.173 -1.227 Tdsirc)1reeion.
0(.)-1786(In91o)aret8 e 5-3(r6(elret8l(s)-3e)-1In91o)a.
Insf815(f)2(ec)1i3(en)10(t)se 6-3(at)15ter/orfe.

7. Loss of Media to Drain.
   a. No flow control installed in drain line.
   b. Air or gasses in raw water.
   c. Unit draws air through brine line.
   d. Defective air check.

m rtr
r t

This procedure provides sequential troubleshooting steps to isolate a suspect cartridge. Figure 17.1 displays the locations of all cartridges.

NOTE: The Dynamic Pressure applied to the valve must be greater than 25 psi at all times when performing the following tests. If a cartridge needs to be removed, follow the cartridge removal procedure in Section 18.0.

There are four symptoms that may require a cartridge to be removed and inspected or replaced.

1. A constant leak from the pilot drain in any cycle position. A small discharge of water from the pilot drain while transitioning from one cycle to the next is normal. A leak from the pilot drain could be caused by the following:
   a. Diaphragm failure in one of the valve cartridges. See Table 17.1 for troubleshooting faulty cartridges.
   b. Debris may prevent the flappers from closing.

Inspect discs and seats.

2. A leak to the main 1.5-inch drain valve port.
   a. If the system is newly installed, ensure that the start-up procedure has been properly followed. Refer to the Service Manual or the start up sheet packed in the shipping carton of the Magnum valve.
   b. If the system has been operating correctly for a period of time and is now leaking, see Table 17.2.

-7 . 2 m t r NOTE: Replacement cartridges are only available as complete assemblies:

r t 4.epnd t wateralLeay2(ai)-g fs a ge or we4aracser un
4.of wed waternlee(s)-n to raiseraiserf as

3. Leakage of untreated water to service.
   a. Leak at riser pipe seal or any other cause mentioned in Service Manua .
   b. Bypassing of untreated water by #4 Inlet cartridge, remove and inspect.
4. Leak between the main valve body and the cartridge assembly.
   a. Remove and replace the two small O-rings at the 5:30 and 6:30 positions of the cartridge. The part number for the O-ring set is P/N 1010116.

Figure 17.1 Logix Magnum Control

18.0 Magnum Cartridge Removal

Removal of cartridges should be done only after reviewing all other possible causes of the problem(s) being addressed. There may be some difficulty removing cartridges in valves that have been in service for a period of time. Scale or iron build up around the O-ring seals may cause breakage in the cage assembly of the cartridge. If this occurs the cartridge must be replaced.

To remove the number 1 or number 2 cartridges the control must be removed first (see Assembly instruction in the Magnum instruction manual, Section 2.1).

What follows is a step-by-step procedure for cartridge removal:

1. Remove the four bolts securing the cartridge.
2. There are two parts or sections in the “cap” of the cartridge assembly. The first part is the cover for the diaphragm. The second part is attached to the main cartridge assembly. This part is in contact with the body of the Magnum valve. When referring to inserting screwdrivers for cartridge removal it is the area between the Magnum valve body and the second part of the cartridge that is being referred to. See Figure 18.1.
3. A small flat blade screwdriver should be inserted as indicated in drawing. Pry a small opening between the Magnum valve body and the second part of the cartridge. This allows the insertion of two larger flat blade screwdrivers that are used to remove the cartridge.
4. Insert the two larger flat blade screwdrivers at the 10 o’clock and 2 o’clock positions on the cartridge. These should be inserted approximately 1/2 inch into the opening created by the small blade screwdriver. Use the two screwdrivers to slowly move the cartridge out of the valve body.

19.0 Performance Parameters

19.1 Performance Curves



19.2 m t r tr

NOTE: All flow rates are based on an inlet pressure of 60 psig (413 kPa). Actual rates vary with pressure, temperatures and other system variables.

20.0		***r***	***11***	***20.0***			***.1***	***1***	***O***

20.2 r tr

-20.2 r tr (m - 0 m)

rt m r	tr					
	m	m	rt 1	rt 2	rt	rt
1040720	5	1.135	Blue	Black	Black	Black
1040721	6	1.362	Red	Black	Black	Black
1040722	7	1.589	Brown	Black	Black	Black
1040723	8	1.816	Green	Black	Black	Black
1040724	9	2.043	White	Black	Black	Black
1040725	10	2.27	Blue	Blue	Black	Black
1040726	11	2.497	Red	Blue	Black	Black
1040727	12	2.724	Red	Red	Black	Black
1040728	13	2.951	Brown	Red	Black	Black
1040729	14	3.178	Brown	Brown	Black	Black
1040740	15	3.405	Blue	Blue	Blue	Black
1040741	16	3.632	Green	Green	Black	Black
1040742	17	3.859	White	Green	Black	Black
1040743	18	4.086	White	White	Black	Black
1040744	19	4.313	White	Orange	Black	Black
1040745	20	4.54	Blue	Blue	Blue	Blue
1040746	21	4.767	Brown	Brown	Brown	Black
1040747	22	4.994	Green	Green	Red	Black
1040748	23	5.221	Green	Green	Brown	Black
1040749	24	5.448	Red	Red	Red	Red
1040730	25	5.675	Green	Green	White	Black
1040731	26	5.902	White	White	Green	Black
1040732	27	6.129	White	White	White	Black
1040733	28	6.356	Brown	Brown	Brown	Brown
1040734	29	6.583	Brown	Brown	Brown	Green
1040735	30	6.81	Orange	Orange	Orange	Black
1040736	31	7.037	Green	Green	Green	Brown
1040737	32	7.264	Green	Green	Green	Green
1040738	33	7.491	Green	Green	Green	White
1040739	34	7.718	Green	Green	Green	Orange
1040750	35	7.945	White	Green	Green	Green
1040751	36	8.172	White	White	White	White
1040752	37	8.399	White	White	White	Orange
1040753	38	8.626	Orange	Orange	Orange	Green
1040754	39	8.853	Orange	Orange	Orange	White
1040755	40	9.08	Orange	Orange	Orange	Orange

NOTE: Drain Line Flow Controls above 40 gpm require external control installed in drain line.

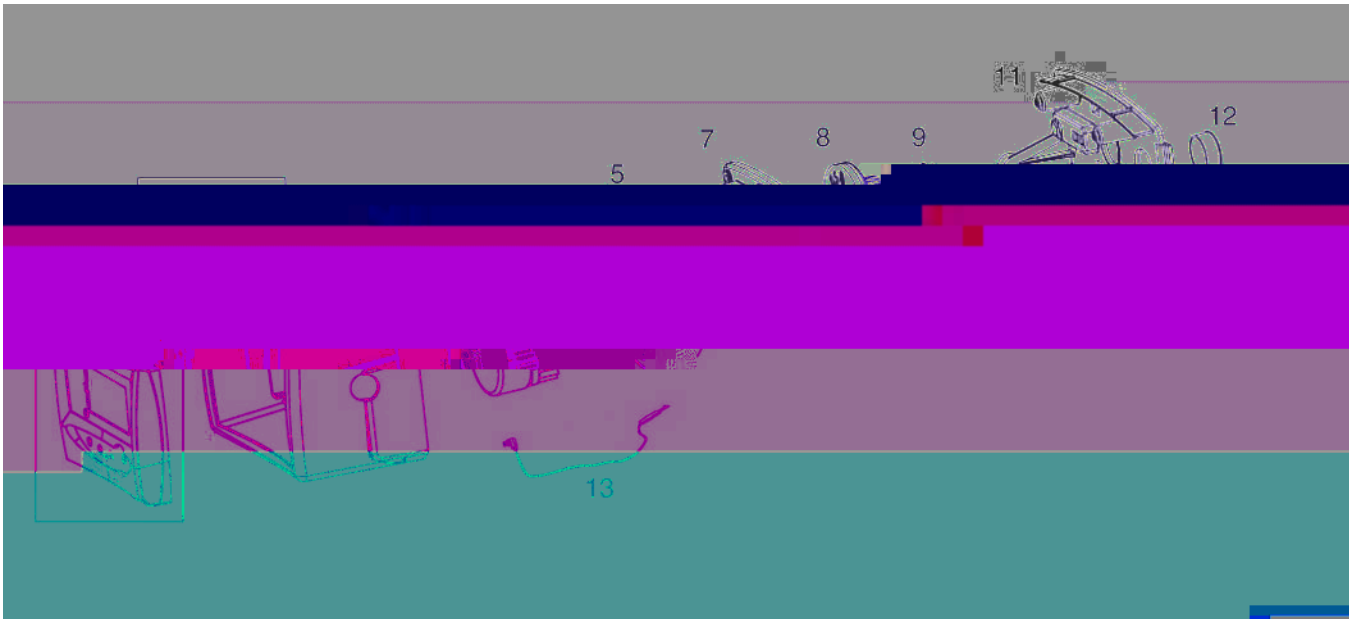
20.[illegible] R mm B Rt f r r

-20.[illegible] R mm B Rt f r r

	[illegible]						
	1 ([illegible]. m)	1 (0. m)	1[illegible] (7 m)	21 ([illegible] m)	2 (1.0 m)	[illegible]0 (.2 m)	[illegible] (1. m)
	[illegible]						
*Softening Resin (5.0 gpm/ft^2) (12.25 m/h/cm^2)	5	7	9	12	15	25	35
*Fine Mesh Softening Resin (2.8 gpm/ft^2) (6.86 m/h/cm^2)	3	4	5	7	9	14	20
Multi Layer (15 gpm/ft^2) (36.75 m/h/cm^2)	15	20	25	36	50	70	105
Birm, Greensand, Carbon (10 gpm/ft^2) (24.5 m/h/cm^2)	10	15	17	25	30	50	70

*50 ^{o}F (10^{o}C) water temperature, 50% bed expansion

20. x m t x



t m .	rt m r t	rt m r	r t
1		3003191	Logix 742 Control, North American
		3003193	Logix 742F Control, North American
		3003197	Logix 762 Control, North American
		3003199	Logix 762F Control, North American
2		1266224	Bushing, Logix Mount
3		1005981	Screw
4		1262674	Cover, Logix Magnum
5	1233809	1005981	Screw
6		1235361	Motor, Logix Cable Assembly
7		1262673	Gear Plate, Logix
8		1262581	Drive Gear, Logix
9		1235373	Optic Sensor
10		1262672	Idler Gear, Logix
11		1262580	Back Plate, Logix Magnum
12		1239647	Bushing, Cable
13		1266722	Meter Cable, 32 inches
		1266723	Meter Cable. 10 feet
		1266724	Meter Cable, 25 feet
*		1263718	Remote Mount Kit, with 10 ft cable
*		1256257	Remote Mount Kit, no extension cable

21.0 R m t m t . x m t r/ t r

21.1 m ft t A m

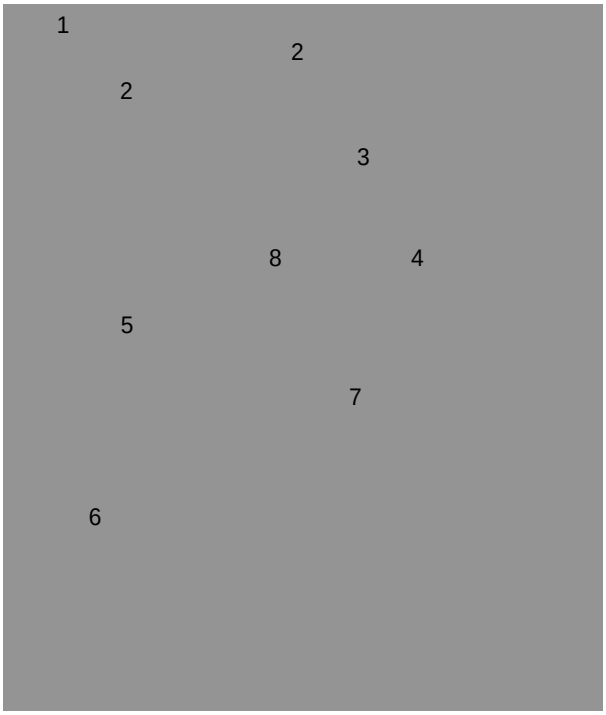


Figure 21.1

-21.1 A m rt

t m m r	rt m r	r t
1	1006095	Screw, Pillow Block
2	1000589	Pillow Block
3	1267726	Logix Magnum Camshaft
4	1000339	Top Plate
5	1234170	Screw Short, Top Plate
6	1000391	Brine Valve Disc
7	1000328	Pilot Valve Disc
8	1006095	Screw Long, Top Plate

21.2 m ft m t

21. m rtr



t m	rt m r	r t
1	1000366	Drain Valve Cartridge, Single Seat - Spring Assisted
2	1000365	Rinse Valve Cartridge, Double Seat - Spring Assisted
3	1000366	No Hardwater Bypass Valve Cartridge, Single Seat - Spring Assisted
4	1000336	Hardwater Bypass Cap
5	1000317	Inlet Valve Cartridge, Double Seat - No Spring Assist
6	1010157	O-Ring
7	1010158	O-Ring
8	1231646	O-Ring
9	1010116	O-Ring (qty. 2 per Cartridge)

NOTE:Items 1 and 3 are identical valve cartridges.

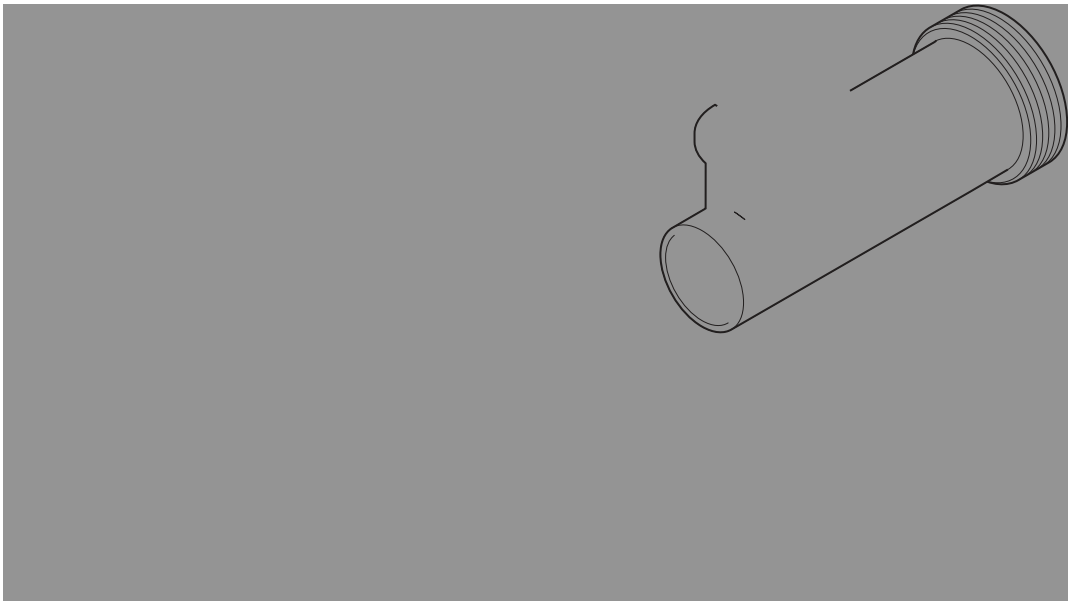
21. **t r A m**



21. R f tr A m

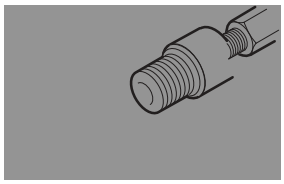


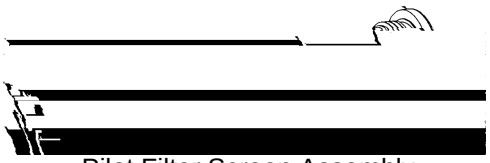
21. **m** **r A** **m**



t m	rt m r	r t
Not Shown	1030663	2-inch Stainless Steel NPT Adapter
Not Shown	1033863	2-inch Stainless Steel NPT Adapter with Drilled and Tapped 1/4-inch NPT Port
Not Shown	1030665	2-inch Stainless Steel BSP Adapter
Not Shown	1033864	2-inch Stainless Steel BSP Adapter with Drilled and Tapped 1/4-inch BSP Port
Not Shown	1030666	2-inch CPVC Adapter
Not Shown	1030667	63-mm Metric PVC Adapter
Not Shown	1002906	1.5-inch to 2-inch Stainless Steel Bell Reducer Coupling
Not Shown	1010160	1.5-inch Adapter O-Ring
Not Shown	1010165	2.0-inch Adapter O-Ring
Not Shown	3024790	Stainless Steel Tank Adapter, 4-inch 8UN Threads
Not Shown	3024788	Stainless Steel Flange

21. **t** **A** **m**





Pilot Filter Screen Assembly