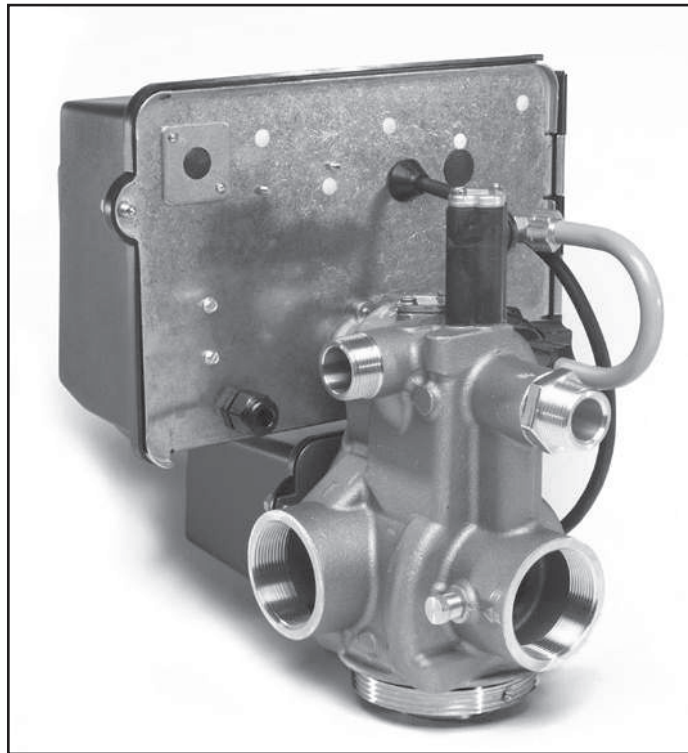


# Model 2900s

## *Service Manual*

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**IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference**

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**IMPORTANT PLEASE READ:**

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi, nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 125°F (52°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects of the vessel and controller, not the membrane. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.

---

# Job Specification Sheet

---

Job Number: \_\_\_\_\_

Model Number: \_\_\_\_\_

Water Hardness: \_\_\_\_\_ ppm or gpg

Capacity Per Unit: \_\_\_\_\_

Mineral Tank Size: \_\_\_\_\_ Diameter: \_\_\_\_\_ Height: \_\_\_\_\_

Salt Setting per Regeneration: \_\_\_\_\_

**1. Type of Timer:**

- A. 7 Day or 12 Day      B. Meter Initiated

**2. Downflow:                      Upflow      Upflow Variable**

**3. Meter Size:**

- A. 3/4" Std Range (125 - 2,100 gallon setting)  
B. 3/4" Ext Range (625 - 10,625 gallon setting)  
C. 1" Std Range (310 - 5,270 gallon setting)  
D. 1" Ext Range (1,150 - 26,350 gallon setting)  
E. 1-1/2" Std Range (625 - 10,625 gallon setting)  
F. 1-1/2" Ext Range (3,125 - 53,125 gallon setting)  
G. 2" Std Range (1,250 - 21,250 gallon setting)  
H. 2" Ext Range (6,250 - 106,250 gallon setting)  
I. 3" Std Range (3,750 - 63,750 gallon setting)  
J. 3" Ext Range (18,750 - 318,750 gallon setting)  
K. Electronic \_\_\_\_\_ Pulse Count \_\_\_\_\_ Meter Size

**4. System Type:**

- A. System #4: 1 Tank, 1 Meter, Immediate, or Delayed Regeneration  
B. System #4: Time Clock  
C. System #4: Twin Tank  
D. System #5: 2-5 Tanks, 2 Meters, Interlock  
E. System #6: 2-5 Tanks, 1 Meter, Series Regeneration  
F. System #7: 2-5 Tanks, 1 Meter, Alternating  
G. System #9: Electronic Only, 2-4 Tanks, Meter per Valve, Alternating  
H. System #14: Electronic Only, 2-4 Tanks, Meter per Valve. Brings units on and offline based on flow.

**5. Timer Program Settings:**

- A. Backwash: \_\_\_\_\_ Minutes  
B. Brine and Slow Rinse: \_\_\_\_\_ Minutes  
C. Rapid Rinse: \_\_\_\_\_ Minutes  
D. Brine Tank Refill: \_\_\_\_\_ Minutes  
E. Pause Time: \_\_\_\_\_ Minutes  
F. Second Backwash: \_\_\_\_\_ Minutes

**6. Drain Line Flow Control: \_\_\_\_\_ gpm**

**7. Brine Line Flow Controller: \_\_\_\_\_ gpm**

**8. Injector Size#: \_\_\_\_\_**

**9. Piston Type:**

- A. Hard Water Bypass  
B. No Hard Water Bypass
-

---

# Installation Instructions

---

**WATER PRESSURE:** A minimum of 20 pounds (1.4 bar) of water pressure is required for regeneration valve to operate effectively.

**ELECTRICAL FACILITIES:** An uninterrupted alternating current (A/C) supply is required. Note: Other voltages are available. Please make sure your voltage supply is compatible with your unit before installation.

**EXISTING PLUMBING:** Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up heavily with lime and/or iron should be replaced. If piping is clogged with iron, a separate iron filter unit should be installed ahead of the water softener.

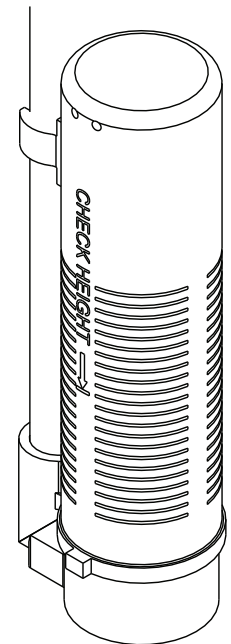
**LOCATION OF SOFTENER AND DRAIN:** The softener should be located close to a drain to prevent air breaks and back flow.

**BY-PASS VALVES:** Always provide for the installation of a by-pass valve if unit is not equipped with one.

**CAUTION:** Water pressure is not to exceed 125 psi (8.6 bar), water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

## Installation Instructions

1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base.
2. During cold weather, the installer should warm the valve to room temperature before operating.
3. All plumbing should be done in accordance with local plumbing codes. The pipe size for residential drain line should be a minimum of 1/2" (13 mm). Backwash flow rates in excess of 7 gpm (26.5 Lpm) or length in excess of 20' (6 m) require 3/4" (19 mm) drain line. Commercial drain lines should be the same size as the drain line flow control.
4. Refer to the dimensional drawing for cutting height of the distributor tube. If there is no dimensional drawing, cut the distributor tube flush with the top of the tank.
5. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on tank. Note: Only use silicone lubricant.
6. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (15 cm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to the DLFC.
7. Teflon tape is the only sealant to be used on the drain fitting. The drain from twin tank units may be run through a common line.
8. Make sure that the floor is clean beneath the salt storage tank and that it is level.
9. Place approximately 1" (25 mm) of water above the grid plate. If a grid is not utilized, fill to the top of the air check (Figure 1) in the salt tank. Do not add salt to the brine tank at this time.
10. On units with a by-pass, place in by-pass position. Turn on the main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation. Once clean, close the water tap.
11. Slowly place the by-pass in service position and let water flow into the mineral tank. When water flow stops, slowly open a cold water tap nearby and let run until the air is purged from the unit.
12. Plug unit into an electrical outlet. Note: All electrical connections must be connected according to local codes. Be certain the outlet is uninterrupted.



60002-34REV C

**Figure 1 Residential Air Check Valve**

	<p><b>CAUTION</b></p> <ul style="list-style-type: none"><li>• Do not exceed 125 psi water pressure</li><li>• Do not exceed 110°F (43°C) water temperature</li><li>• Do not subject unit to freezing conditions</li></ul>
--	--

# 3200 Timer Setting Procedure

## How To Set Days On Which Water Conditioner Is To Regenerate (Figure 2):

Rotate the skipper wheel until the number "1" is at the red pointer. Set the days that regeneration is to occur by sliding tabs on the skipper wheel outward to expose trip fingers. Each tab is one day. Finger at red pointer is tonight. Moving clockwise from the red pointer, extend or retract fingers to obtain the desired regeneration schedule.

## How To Set The Time Of Day:

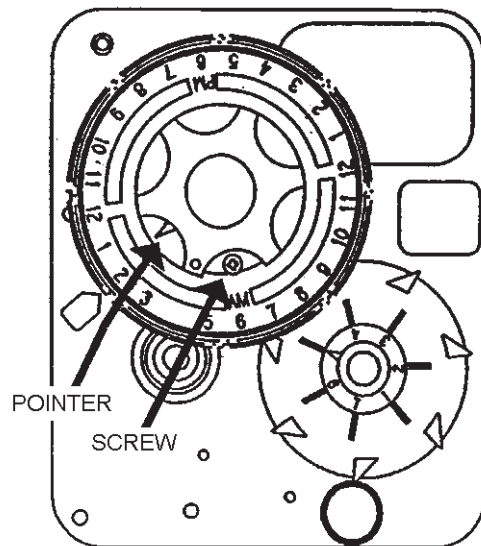
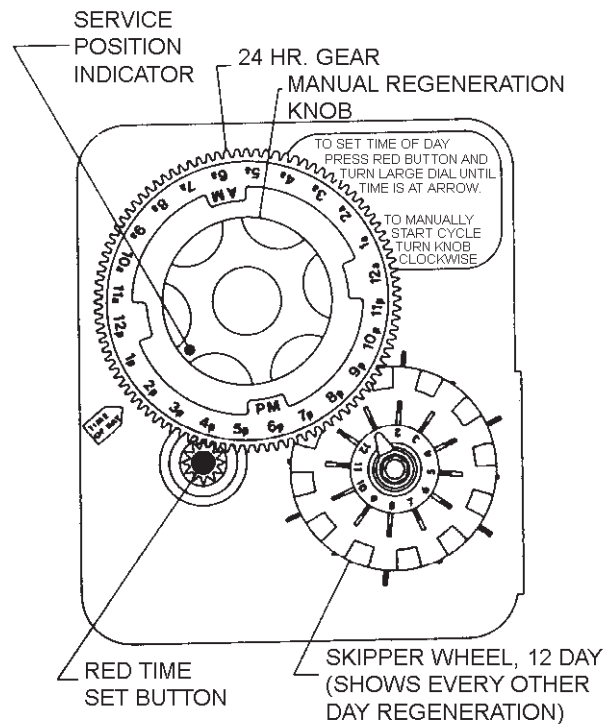
1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is at the time of day pointer.
3. Release the red button to again engage the drive gear.

## How To Manually Regenerate Your Water Conditioner At Any Time:

1. Turn the manual regeneration knob clockwise.
2. This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.
3. The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
4. Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set for only one half of this time.
5. In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.

## How to Adjust Regeneration Time:

1. Disconnect the power source.
2. Locate the three screws behind the manual regeneration knob by pushing the red button in and rotating the 24 hour dial until each screw appears in the cut out portion of the manual regeneration knob.
3. Loosen each screw slightly to release the pressure on the time plate from the 24 hour gear.
4. Locate the regeneration time pointer on the inside of the 24 hour dial in the cut out.
5. Turn the time plate so the desired regeneration time aligns next to the raised arrow.
6. Push the red button in and rotate the 24 hour dial. Tighten each of the three screws.
7. Push the red button and locate the pointer one more time to ensure the desired regeneration time is correct.
8. Reset the time of day and restore power to the unit.



3200 ADJUSTABLE REGENERATION TIMER

**IMPORTANT!**  
SALT LEVEL MUST ALWAYS BE ABOVE  
WATER LEVEL IN BRINE TANK

61502\_3200REVA

Figure 2

# 3210 & 3220 Timer Settings

## Typical Programming Procedure

Calculate the gallon capacity of the system, subtract the necessary reserve requirement and set the gallons available opposite the small white dot on the program wheel gear (Figure 3).

**NOTE:** Drawing shows 8,750 gallon setting. The capacity (gallons) arrow (15) shows zero gallons remaining. The unit will regenerate tonight at the set regeneration time.

## How To Set The Time Of Day:

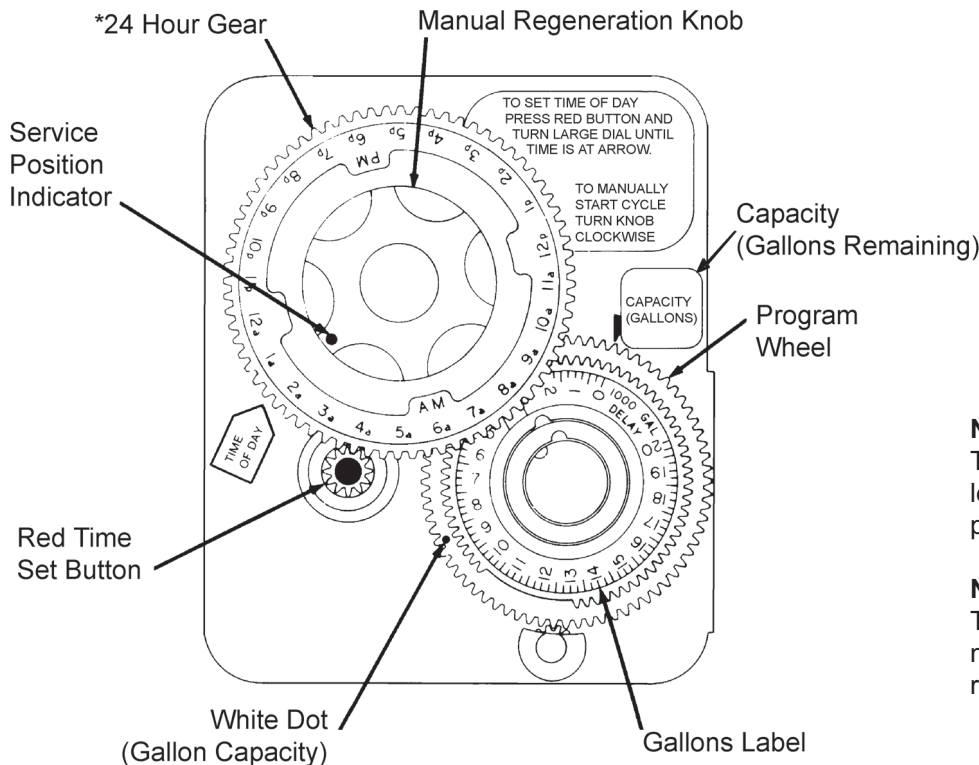
1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is opposite the time of day pointer.
3. Release the red button to again engage the drive gear.

## How To Manually Regenerate Your Water Conditioner At Any Time:

1. Turn the manual regeneration knob clockwise.
2. This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.
3. The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
4. Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set for only one half of this time.
5. In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.

## Immediate Regeneration Timers:

These timers do not have a 24 hour gear. Setting the gallons on the program wheel and manual regeneration procedure are the same as previous instructions. The timer will regenerate as soon as the capacity gallons reaches zero.



## NOTE:

The program wheel to the left may be different than the program wheel on the product.

## NOTE:

To set meter capacity rotate manual knob one - 360° revolution to set gallonage.

\*Immediate regeneration timers do not have a 24-hour gear. No time of day can be set.

61502\_3200REVA

Figure 3



---

# 3200 , 3210, 3220, & 3230 Regeneration Cycle Setting Procedure

---

## How To Set The Regeneration Cycle Program:

The regeneration cycle program on your water conditioner has been factory preset, however, portions of the cycle or program may be lengthened or shortened in time to suit local conditions.

### 3200 & 3210 Series Timers (Figure 4)

1. To expose cycle program wheel, grasp timer in upper left-hand corner and pull, releasing snap retainer and swinging timer to the right.
2. To change the regeneration cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs toward center, lift program wheel off timer. Switch arms may require movement to facilitate removal.
3. Return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires locate above snap retainer post.

## Timer Setting Procedure for 3200 & 3210 Timer

### How To Change The Length Of The Backwash Time:

The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your unit will backwash.

**EXAMPLE:** If there are six pins in this section, the time of backwash will be 12 min. (2 min. per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equals the backwash time in minutes.

### How To Change The Length Of Brine And Rinse Time:

1. The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your unit will brine and rinse (2 min. per hole).
2. To change the length of brine and rinse time, move the rapid rinse group of pins to give more or fewer holes in the brine and rinse section. Number of holes times two equals brine and rinse time in minutes.

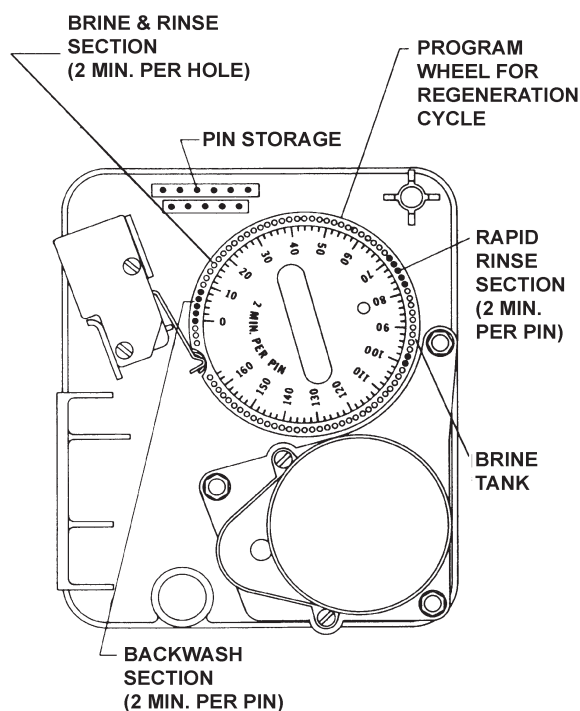


Figure 4

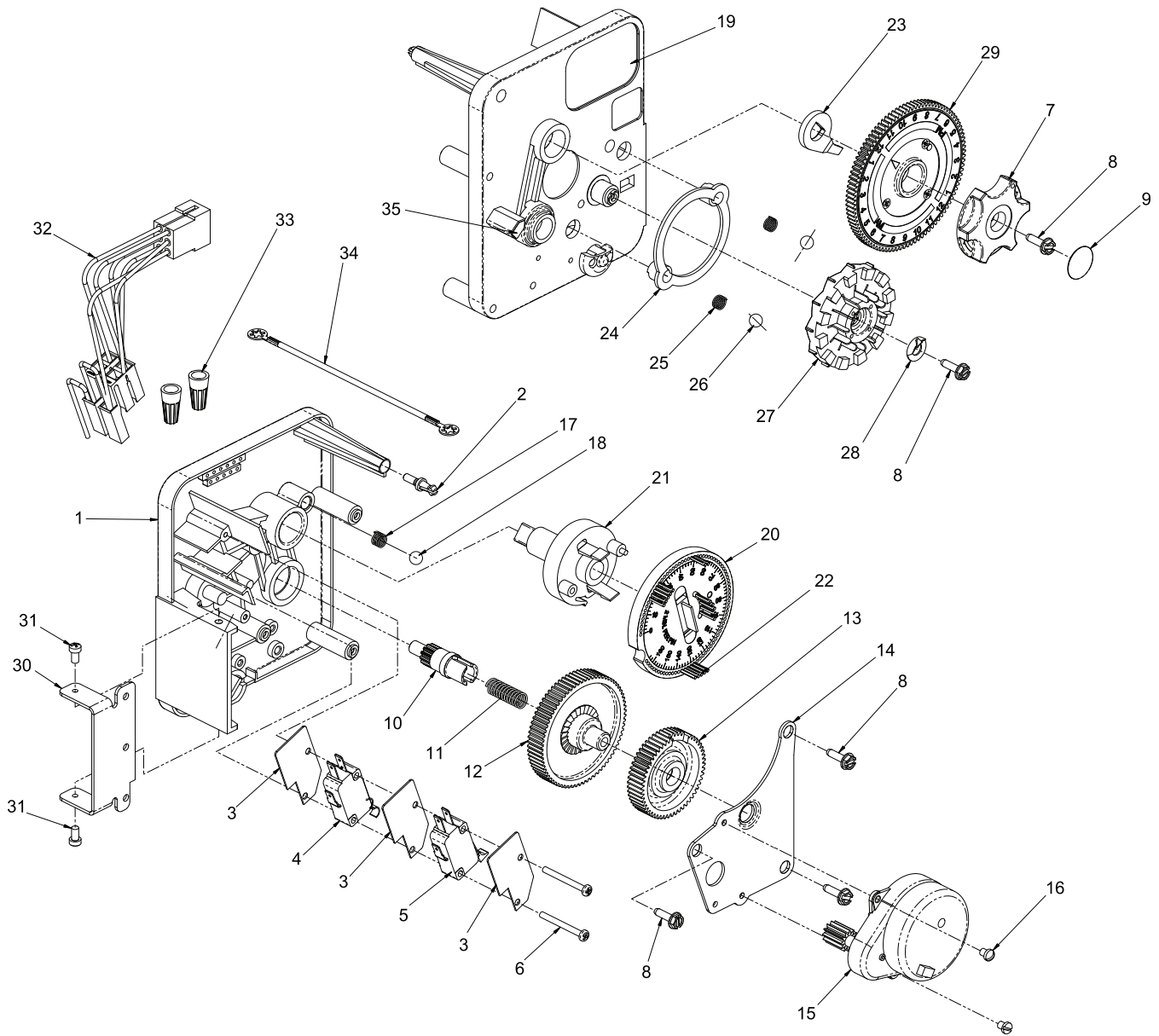
### How To Change The Length Of Rapid Rinse:

1. The second group of pins on the program wheel determines the length of time that your water conditioner will rapid rinse (2 min. per pin).
2. To change the length of rapid rinse time, add or remove pins at the higher numbered end of this section as required. The number of pins times two equals the rapid rinse time in minutes.

### How To Change The Length Of Brine Tank Refill Time:

1. The second group of holes in the program wheel determines the length of time that your water conditioner will refill the brine tank (2 min. per hole).
2. To change the length of refill time, move the two pins at the end of the second group of holes as required.
3. The regeneration cycle is complete when the outer microswitch is tripped by the two pin set at end of the brine tank refill section.
4. The program wheel, however, will continue to rotate until the inner micro switch drops into the notch on the program wheel.

# 3200 Time Clock Timer Assembly



61502-3200\_REVA

For Service Assembly Numbers, See the Back of this Manual



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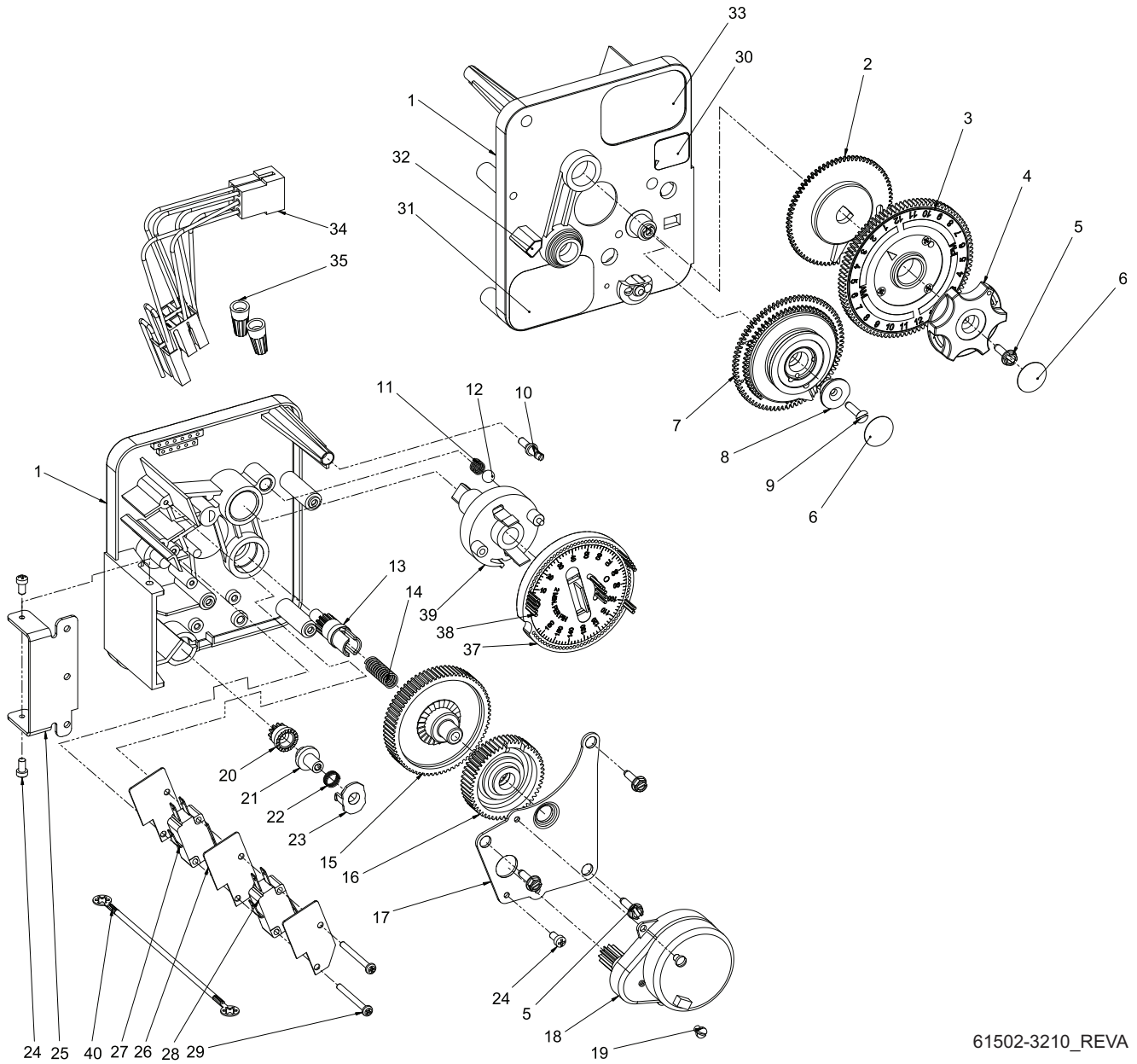
## 3200 Time Clock Timer Assembly

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Item No.	Quantity	Part No.	Description
1.....	1 .....	13870 .....	Housing, Timer, 3200
2.....	1 .....	14265 .....	Clip, Spring
3.....	3 .....	14087 .....	Insulator
4.....	1 .....	10896 .....	Switch, Micro
5.....	1 .....	15320 .....	Switch, Micro, Timer
6.....	2 .....	11413 .....	Screw, Pan Hd Mach, 4-40 x 1 1/8
7.....	1 .....	13886 .....	Knob, 3200
8.....	5 .....	13296 .....	Screw, Hex Wsh, 6-20 x 1/2
9.....	1 .....	11999 .....	Label, Button
10.....	1 .....	13018 .....	Pinion, Idler
11.....	1 .....	13312 .....	Spring, Idler Shaft
12.....	1 .....	13017 .....	Gear, Idler
13.....	1 .....	13164 .....	Gear, Drive
14.....	1 .....	13887 .....	Plate, Motor Mounting
15.....	1 .....	18743-1 .....	Motor, 120V, 60Hz, 1/30 rpm, 5600
		19659-1 .....	Motor, 24V, 60Hz, 1/30 rpm
16.....	2 .....	13278 .....	Screw, Sltd Fillister Hd 6-32 x .156
17.....	1 .....	15424 .....	Spring, Detent, Timer
18.....	1 .....	15066 .....	Ball, 1/4", Delrin
19.....	1 .....	15465 .....	Label, Caution
20.....	1 .....	19210 .....	Program Wheel Assembly
21.....	1 .....	13911 .....	Gear, Main Drive, Timer
22.....	17 .....	41754 .....	Pin, Spring, 1/16 x 5/8 Stainless Steel, Timer
23.....	1 .....	13011 .....	Arm, Cycle Actuator
24.....	1 .....	13864 .....	Ring, Skipper Wheel
25.....	2 .....	13311 .....	Spring, Detent, Timer
26.....	2 .....	13300 .....	Ball, 1/4", Stainless Steel
27.....	1 .....	14381 .....	Skipper Wheel Assembly, 12 Day
		14860 .....	Skipper Wheel Assembly, 7 Day
28.....	1 .....	13014 .....	Pointer, Regeneration
29.....	1 .....	40096-24 .....	Dial, 12 AM Regen Assembly, Black
		40096-02 .....	Dial, 2 AM Regen Assembly, Black
30.....	1 .....	13881 .....	Bracket, Hinger Timer
31.....	2 .....	11384 .....	Screw, Phil, 6-32 x 1/4 Zinc
32.....	1 .....	13902 .....	Harness, 3200
33.....	2 .....	40422 .....	Nut, Wire, Tan
34.....	1 .....	15354-01 .....	Wire, Ground, 4"
35.....	1 .....	14007 .....	Label, Time of Day

**For Service Assembly Numbers, See the Back of this Manual**

# 3210 Meter Delayed Timer Assembly



61502-3210\_REVA

For Service Assembly Numbers, See the Back of this Manual

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## **3210 Meter Delayed Timer Assembly**

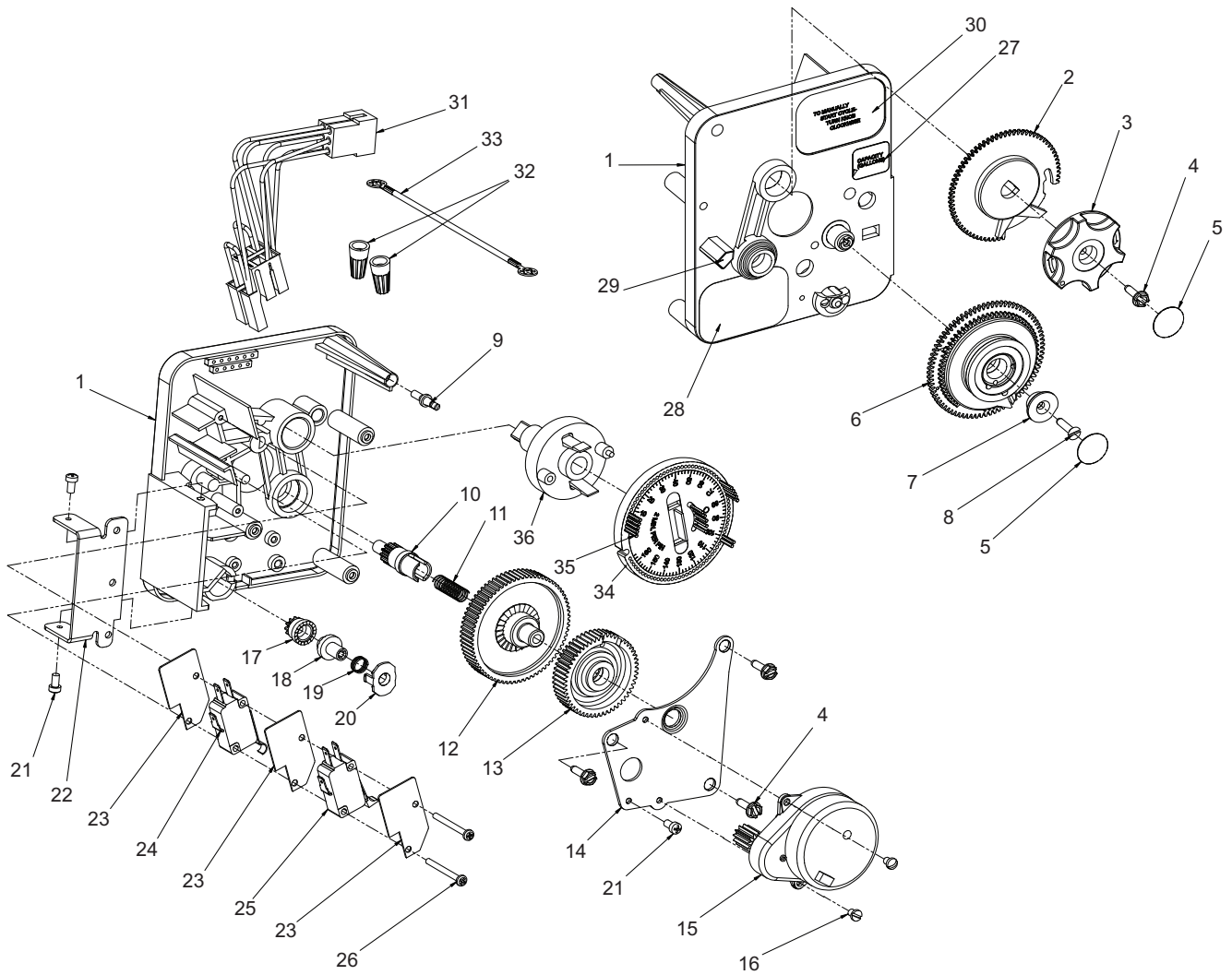
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<b>Item No.</b>	<b>Quantity</b>	<b>Part No.</b>	<b>Description</b>
1.....	1 .....	13870 .....	Housing, Timer, 3200
2.....	1 .....	13802 .....	Gear, Cycle Actuator
3.....	1 .....	40096-02 .....	Dial 2AM Regen Assembly, Black
4.....	1 .....	13886 .....	Knob, 3200
5.....	4 .....	13296 .....	Screw, Hex Wsh, 6-20 x 1/2
6.....	2 .....	11999 .....	Label, Button
7.....	1 .....	60405-50 .....	Program Wheel, w/2" Std Label, w/People Label Set @ 21
8.....	1 .....	13806 .....	Retainer, Program Wheel
9.....	1 .....	13748 .....	Screw, Flat Head St, 6-20 x 1/2
10.....	1 .....	14265 .....	Clip, Spring
11.....	1 .....	15424 .....	Spring, Detent, Timer
12.....	1 .....	15066 .....	Ball, 1/4" Delrin
13.....	1 .....	13018 .....	Pinion, Idler
14.....	1 .....	13312 .....	Spring, Idler Shaft
15.....	1 .....	13017 .....	Gear, Idler
16.....	1 .....	13164 .....	Gear, Drive
17.....	1 .....	13887 .....	Plate, Motor Mounting
18.....	1 .....	18743-1 .....	Motor, 120V, 60Hz 1/30 rpm, 5600
19.....	1 .....	13278 .....	Screw, Fillister Hd, 6-32 x .156
20.....	1 .....	13830 .....	Pinion, Program Wheel Drive
21.....	1 .....	13831 .....	Clutch, Drive Pinion
22.....	1 .....	14276 .....	Spring, Meter, Clutch
23.....	1 .....	14253 .....	Retainer, Clutch Spring
24.....	3 .....	11384 .....	Screw, Phil, 6-32 x 1/4
25.....	1 .....	13881 .....	Bracket, Hinge Timer
26.....	3 .....	14087 .....	Insulator
27.....	1 .....	10896 .....	Switch, Micro
28.....	1 .....	15320 .....	Switch, Micro, Timer
29.....	2 .....	11413 .....	Screw, Pan Hd Mach, 4-40 x 1 1/8
30.....	1 .....	14198 .....	Label, Indicator
31.....	1 .....	15465 .....	Label, Caution
32.....	1 .....	14007 .....	Label, Time of Day
33.....	1 .....	14045 .....	Label, Instruction
34.....	1 .....	13902 .....	Harness, 3200
35.....	2 .....	40422 .....	Nut, Wire, Tan
36.....	1 .....	15354-01 .....	Wire, Ground, 4"
37.....	1 .....	19210 .....	Program Wheel Assembly
38.....	17 .....	41754 .....	Pin, Spring, 1/16 x 5/8 Stainless Steel, Timer
39.....	1 .....	13911 .....	Gear, Main Drive, Timer
40.....	1 .....	15354-01 .....	Wire, Ground 4"

**For Service Assembly Numbers, See the Back of this Manual**

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# 3220 Meter Immediate Timer Assembly



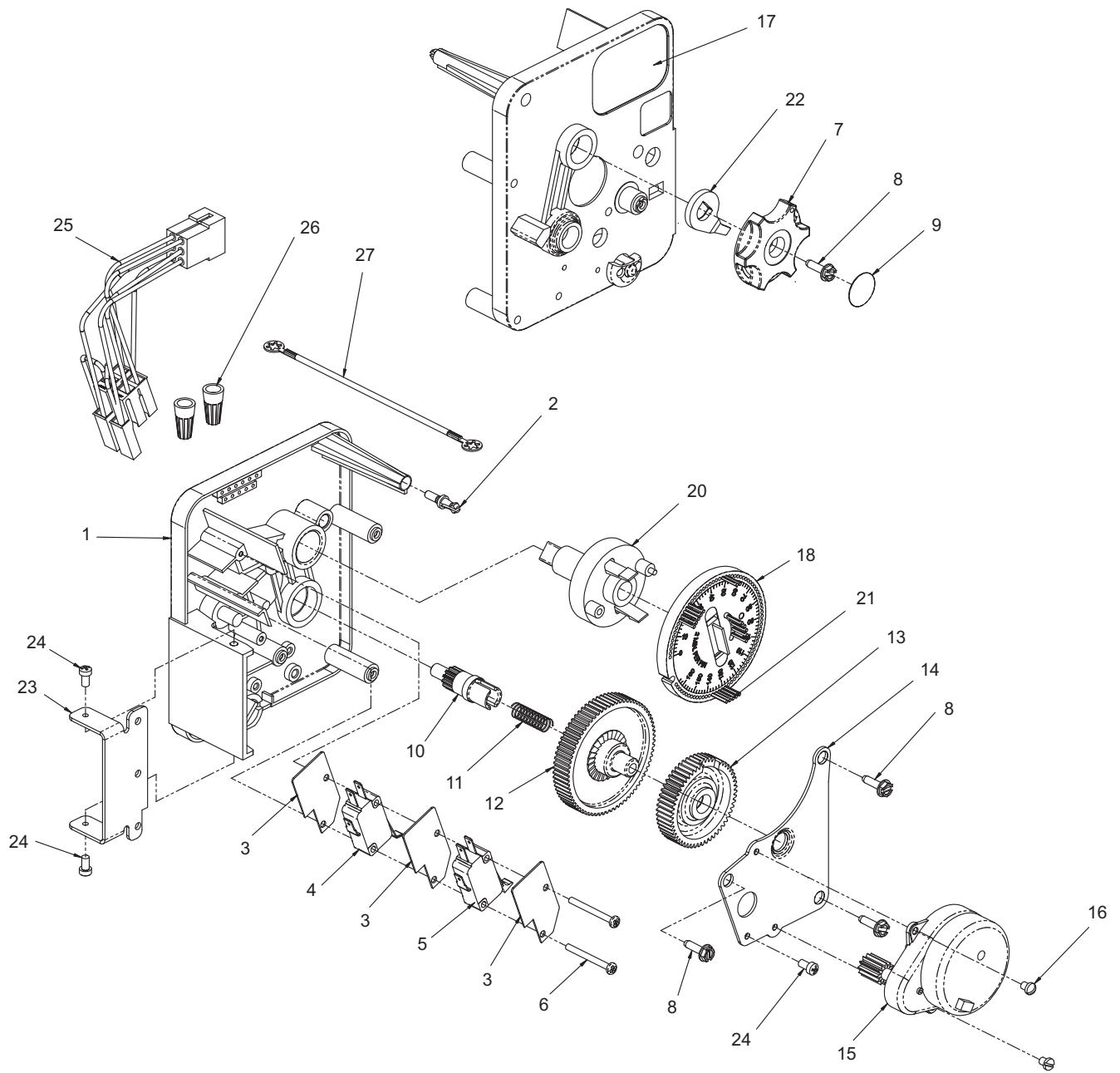
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## 3220 Meter Immediate Timer Assembly

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Item No.	Quantity	Part No.	Description
1	1	13870	Housing, Timer
2	1	15431	Gear, Cycle Actuator, System #5
3	1	13886	Knob, 3200
4	4	13296	Screw, Hex Wsh, 6-20 x 1/2
5	2	11999	Label, Button
6	1	60408-50	Program Wheel, W/2" Std Label
7	1	13806	Retainer, Program Wheel
8	1	13748	Screw, Flt Hd St, 6-20 x 1/2
9	1	14265	Spring Clip
10	1	13018	Pinion, Idler
11	1	18563	Idler Shaft Spring
12	1	13017	Gear, Idler
13	1	13164	Drive Gear
14	1	13887	Plate, Motor Mounting
15	1	18743-1	Motor, 120V, 60 Hz, 1/30 rpm, 5600
16	2	13278	Screw, Slt'd Fillister Hd
17	1	14502	Pinion, Program Wheel
18	1	14501	Clutch, Drive Pinion
19	1	14276	Meter Clutch Spring
20	1	14253	Retainer, Clutch Spring
21	3	11384	Screw, Phil, 6-32 x 1/4 Zinc
22	1	13881	Bracket, Hinge Timer
23	3	14087	Insulator
24	1	15414-00	Micro Switch
25	1	15320	Switch, Micro, Timer
26	2	11413	Screw, Pan Hd Mach, 4-40 x 1-1/8
27	1	14198	Label, Indicator
28	1	15465	Label, Caution
29	1	14007	Label, Time of Day
30	1	15148	Label, Instruction
31	1	40617	Harness, 3220
32	2	40422	Nut, Wire, Tan
33	1	15354-01	Wire, Ground, 4"
34	1	19210-05	Program Wheel Assembly, 9000/3230
35	17	41754	Pin, Spring, 1/16 x 5/8 Stainless Steel, Timer
36	1	15055	Gear, Main Drive

# 3230 Remote Start Timer Assembly





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## 3230 Remote Start Timer Assembly

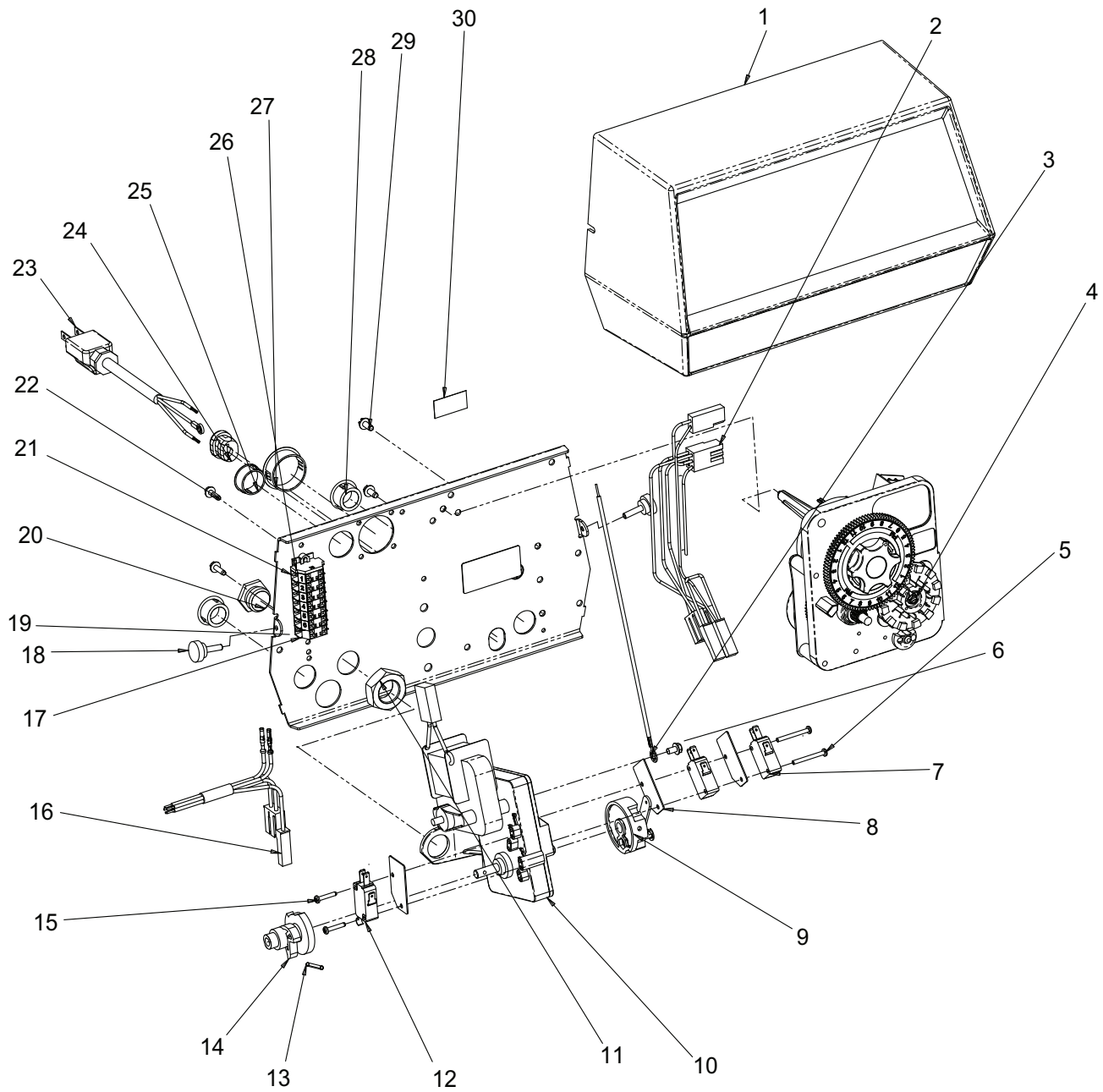
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Item No.	Quantity	Part No.	Description
1	1	13870	Housing, Timer
2	1	14265	Spring Clip
3	3	14087	Insulator
4	1	15314	Micro Switch
5	1	15320	Switch, Micro, Timer
6	2	11413	Screw, Pan Hd Mach, 4-40 x 1-1/8
7	1	13886	Knob, 3200
8	4	13296	Screw, Hex Wsh, 6-20 x 1/2
9	1	11999	Label, Button
10	1	13018	Pinion, Idler
11	1	18563	Idler Shaft Spring
12	1	13017	Gear, Idler
13	1	15055	Drive Gear
14	1	13887	Plate, Motor Mounting
15	1	18743-1	Motor, 120V, 60 Hz, 1/10 rpm
	1	19659-1	Motor, 24V, 60 Hz 1/30 rpm
16	2	13278	Screw, Sltd Fillister Hd
17	1	15313	Label, Caution
18	1	19210-05	Program Wheel Assembly, 3200
20	1	15055	Main Drive Gear
21	17	41754	Pin, Spring, 1/16 x 5/8 Stainless Steel, Timer
22	1	13011	Cycle Actuator Arm
23	1	13881	Bracket, Hinge Timer
24	3	11384	Screw, Phil, 6-32 x 1/4 Zinc
25	1	16336	Harness, 3230R
26	2	40422	Nut, Wire, Tan
27	1	15354-01	Wire, Ground, 4"

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# Upper Designer Powerhead Assembly

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**For Service Assembly Numbers, See the Back of this Manual**

# Upper Designer Powerhead Assembly

Item No.	Quantity	Part No.	Description
1	1	19291-020	Cover, Designer
2	1	14822	Harness, 2900
	1	16563	Harness, 2900/3900/Sys 7
	1	18585	Harness, 3900, Aux Switch
	1	40395	Harness, Drive, Sys#7, Multi
	1	40400	Harness, Drive, Designer/Environmental
3	1	40175-01	Wire, Ground, Commercial Valves
4	1	3200 Meter Timer Assy	3200 Meter Timer Assembly
	-	3200 Clock Timer Assy	3200 Clock Timer Assembly
5	2	14923	Screw, Pan Hd Mach, 4-40 X 1
6	5	10872	Screw, Hex Wsh, 8-32 X 17/64
7	2	10218	Switch, Micro
8	3	10302	Insulator, Limit Switch
9	1	60160-15	Drive Cam Assy, STF, Blue, 2900
	1	60160-30*	Drive Cam Assy, Upflow
	1	60160-31*	Drive Cam Assy, Upflow, Variable
10	1	41543	Motor, Drive, 115V, 50/60 Hz
	1	40384	Motor, Drive, 115V, 60Hz, SP, Fam 1
	1	42579	Motor, Drive, 24VAC/DC, 50/60 Hz
	1	40386	Motor, Drive, 220V, 50/60 Hz, SP Fam 1
11	1	10269	Nut, Jam, 3/4-16
12	1	10896	Switch, Micro
13	1	10338	Pin, Roll, 3/32 x 7/8
14	1	12472	Cam Assy, Tri-Stack, After RR
	1	12777	Cam, Shut-Off Valve
	1	15770	Cam Assy, Special Tri-Stack, After Brine Fill
	1	15805	Cam, SVO
	1	19749*	Cam, Brine, 2750, U/F, Variable
	1	19887*	Cam, Brine, 2750 U/F Std
15	2	11805	Screw, Rd Hd, 4-40 X 5/8
16	1	14822	Harness, 2900
17	1	40174	Terminal Block, Green/Yellow Commercial
18	1	40264	Backplate, w/t - Screws, 2750, 2850, 2900
19	2	15250	Label, Terminal Strip
20	1	10712	Fitting, Brine Valve
21	6	41084	Terminal Block, Segment, Gray
22	2	13296	Screw, Hex Wsh, 6-20 X 1/2
23	1	11545	Power Cord, 4' European, Black
	1	19303	Power Cord, 8', Australian
	1	19885	Power Cord, Japanese, 110V/120V
	1	40084-12	Power Cord, 12' US, ROUND, 120V Sys 5, 6, 7
	1	40085-12	Power Cord, 12' US, Round, 240V
24	1	13547	Strain Relief, Flat Cord Heyco #30-1
	1	13547-01	Strain Relief, Euro Round Cord
	1	13547-02	Strain Relief, U.S. Round
	1	14924	Strain Relief, Heyco #1247
25	1	15806	Plug, Hole, Heyco #2693
26	1	41085	Endplate, Terminal Block, Gray
27	1	17421	Plug, 1.20 Hole Heyco #2733
28	1	13741	Plug, 3/4", Knock-Out, Heyco #2683
29	2	10300	Screw, Slot Hex Wsh, 8-18 X 3/8 Type "B" RC44-47
30	1	40038-03	Label, Voltage, 120V, 3200ET

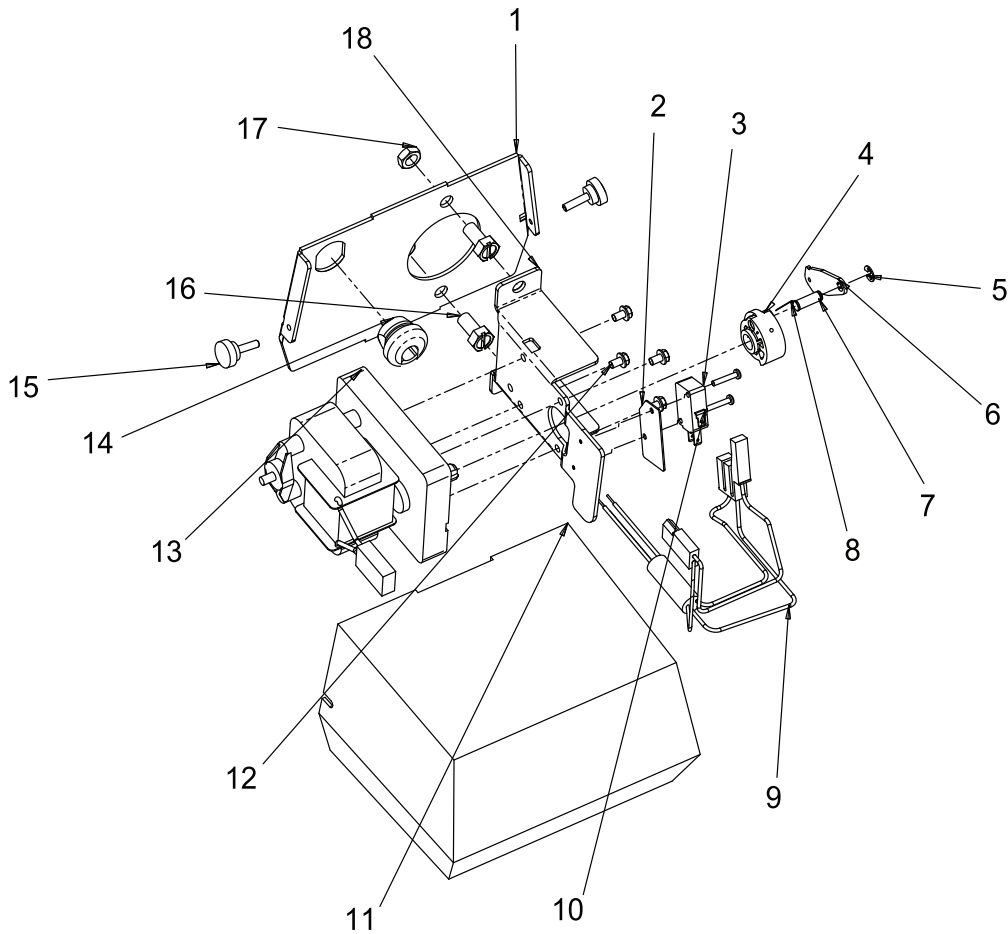
**Not Shown:**

.....	1	15216	Meter Cable Assy, 15.25"
.....	1	15879	Cable Guide Assy, 2900

\*Upflow Only

**For Service Assembly Numbers, See the Back of this Manual**

# Lower Designer Powerhead Assembly

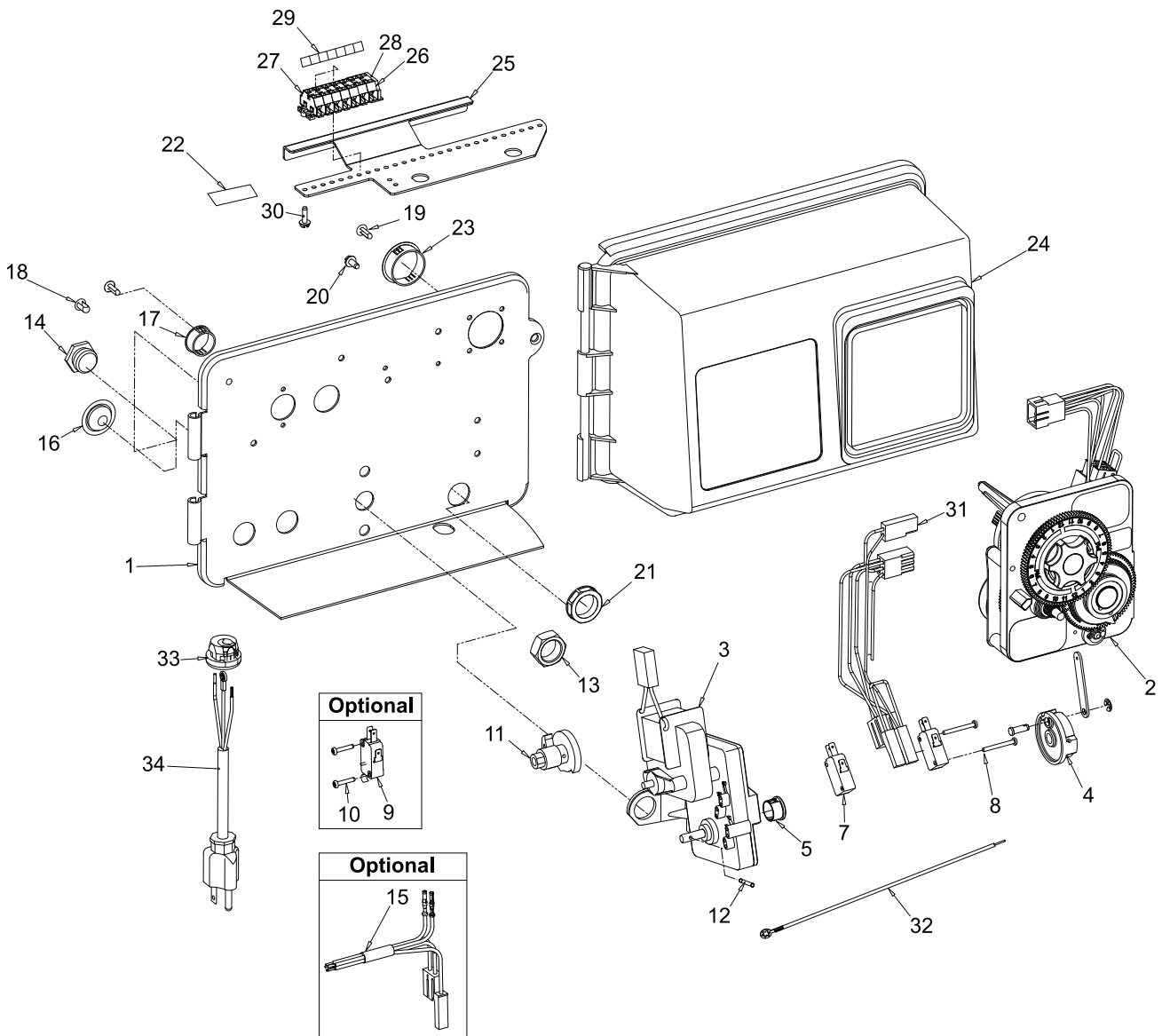


Item No.	Quantity	Part No.	Description
1	1	14770	Backplate, Lower 2900
2	1	10302	Insulator, Limit Switch
3	1	10218	Switch, Micro
4	1	14775	Cam, Drive, 2900
5	1	10250	Ring, Retaining
6	1	14759	Link, Piston Rod
7	1	14784	Bearing, Connecting Rod
8	1	41022	Pin, Roll, 2900 Lower
9	1	40402	Harness, Lead, Sys #4, Designer
10	2	19849	Screw, Pan Hd, 4-40 X 5/8
11	1	14800-02	Cover, Dust, Lower, 2900, Black
12	4	10872	Screw, Hex Wsh, 8-32 X 17/64
13	1	40387	Motor, Drive, 115V, 60Hz, SP FAM 2
	1	42580	Motor, Drive, 24VAC/DC, 50/60 Hz
	1	40389	Motor, Drive, 220V, 50/60 Hz, Sp Fam 2
14	1	14924	Strain Relief Heyco #1247
15	2	19367	Screw, Designer Cover, Thumb 8-32 Black UV Stable
16	2	11224	Screw Hex Hd, 5/16 - 18 x 5/8 MS 410 Stainless Steel
17	2	16346	Nut, Hex, Jam, 5/16-18
18	1	14769	Bracket, Motor, 2900

**For Service Assembly Numbers, See the Back of this Manual**



# Upper Environmental Powerhead Assembly



61501-2900\_REV C

For Service Assembly Numbers, See the Back of this Manual



# Upper Environmental Powerhead Assembly

Item No.	Quantity	Part No.	Description
1	1	18697-15	Backplate, Hinged
2	1	3200 Clock Timer Assy	3200 Clock Timer Assembly
	1	3200 Meter Timer Assy	3200 Meter Timer Assembly
3	1	41543	Motor, Drive, 115V, 50/60 Hz
	1	42579	Motor, Drive, 24VAC/DC, 50/60 Hz
	1	41545	Motor, Drive, 230V, 50/60 Hz
4	1	60160-15	Drive Cam Assembly, STF, Blue, 2900
	1	60160-30*	Drive Cam Assembly, Upflow
	1	60160-31*	Drive Cam Assembly, Upflow, Variable
5	1	17904	Bushing, Heyco 1/2, Heyco #2073
7	2	10218	Switch, Micro
8	2	14923	Screw, Pan Hd Mach, 4-40 X 1 MS Steel Zinc
9	1	10896	Switch, Micro
10	2	11805	Screw, Rd Hd, 4-40 X 5/8 TYPE 1 Steel Zinc
11	1	12472	Cam Assy, Tri-Stack, After RR
	1	12777	Cam, Shut-Off Valve
	1	15770	Cam Assy, Special Tri-Stack, After Brine Fill
	1	15805	Cam, SVO
	1	19887*	Cam, Brine, 2750 U/F, Std
12	2	10338	Pin, Roll 3/32 x 7/8
13	1	10269	Nut, Jam, 3/4-16
14	1	10712	Fitting, Brine Valve
15	1	14822	Harness, 2900
16	2	19691	Plug, .750 Dia Recessed, Black
17	1	15806	Plug, Hole, Heyco #2693
18	1	19801	Plug, .190 Dia, White Heyco 0307
19	7	19800	Plug, .140 Dia, White Heyco 0304
20	4	10300	Screw, Slot Hex Wsh, 8-18 X 3/8 Type "B" RC 44-47
21	1	18691-02	Nut, Conduit Fitting 1/2"
22	1	40038-03	Label, Voltage, 120V, 3200ET
23	1	17421	Plug, 1.20 Hole Heyco #2733
24	1	60219-02	Cover Assembly, Environmental, Black w/Clear Window
25	1	19772	Bracket, Terminal Block
26	1	40174	Terminal Block, Green/Yellow Commercial, 809-260/141
27	6	41084	Terminal Block, Segment, Gray
28	1	41085	Endplate, Terminal Block, Gray
29	2	15250	Label, Terminal Strip
30	2	13296	Screw, Hex Wsh, 6-20 6-20 x 1/2 Type 25 Steel Zinc
31	1	40400	Harness, Drive, Designer/Environmental
32	1	40175-01	Wire, Ground, Commercial Valves
33	1	13547	Strain Relief, Flat Cord Heyco #30-1
	1	13547-01	Strain Relief, Euro Round Cord
	1	13547-02	Strain Relief, U.S. Round
34	1	11545	Powercord, 4' European, Black
	1	19303	Powercord, 8', Australian
	1	40084-12	Powercord, 12' US, Round, 120V, Sys 5,6,7&2900/3150/3900
	1	40085-12	Powercord, 12' US, Round, 240V

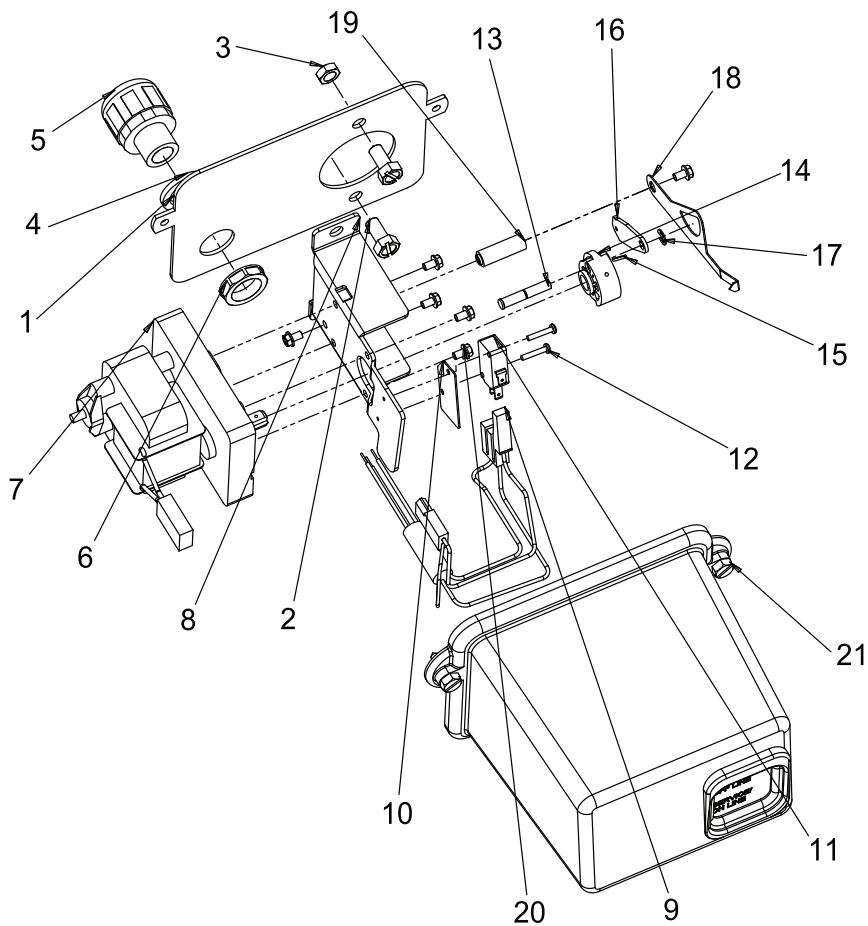
Not Shown:

..... 1	15216	Meter Cable Assembly, 15.25"
..... 1	15879	Cable Guide Assembly, 2900

\*Upflow Only

**For Service Assembly Numbers, See the Back of this Manual**

# Lower Environmental Powerhead Assembly



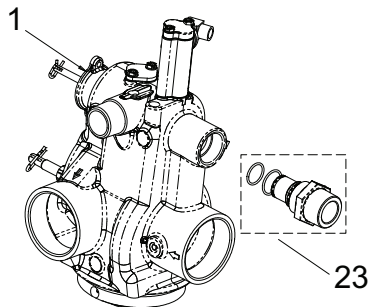
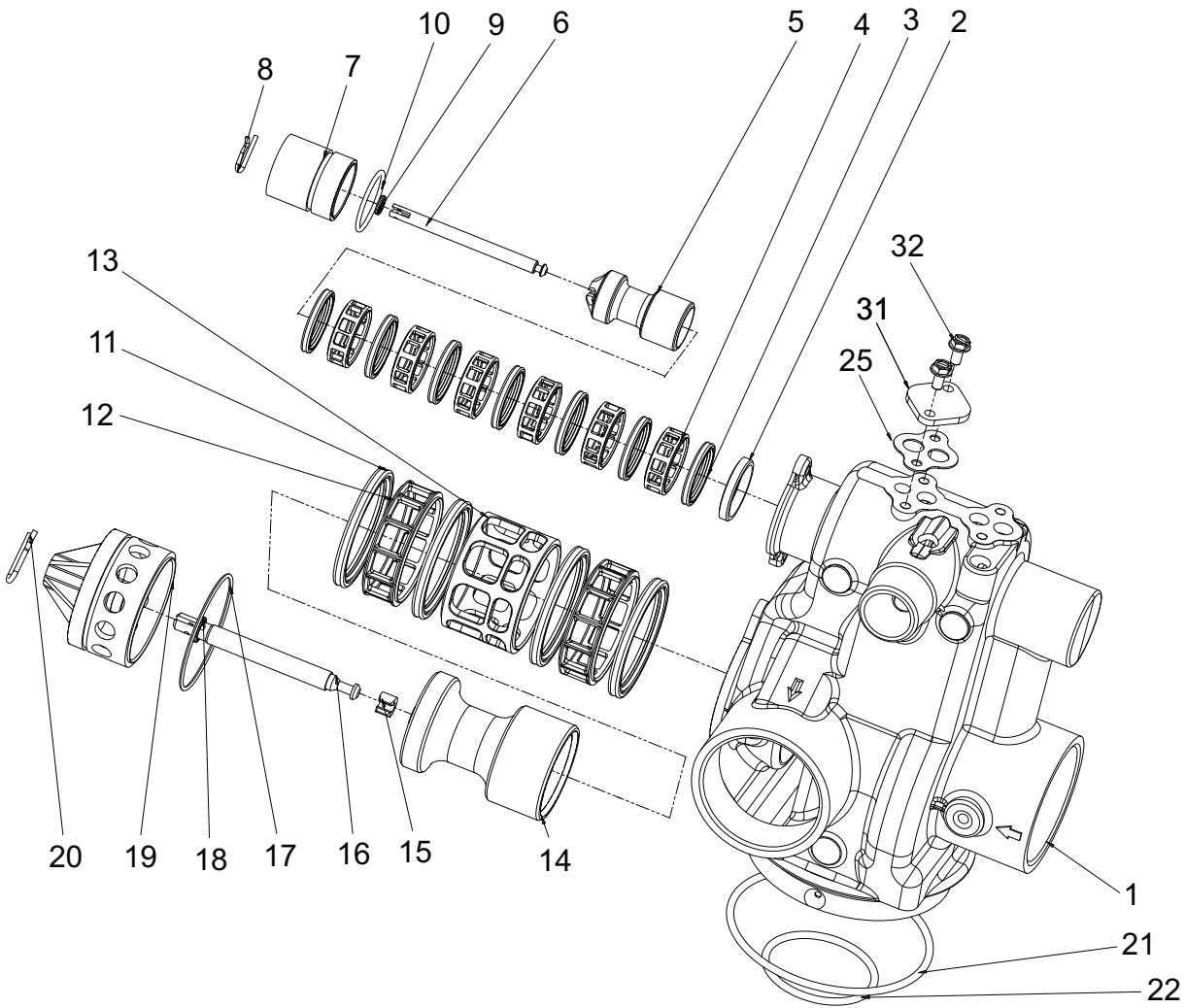
61501-2900\_REVC

Item No.	Quantity	Part No.	Description
1	1	18709	Backplate, Lower
2	2	11224	Screw, Hex Hd, 5/16 - 18 x 5/8
3	2	16346	Nut, Hex, JAM, 5/16-18, 18-8 Stainless Steel
4	1	18692	Washer, 3/8, Sealing
5	1	18691-01	Fitting, Conduit
6	1	18691-02	Nut, Conduit Fitting, 1/2"
7	1	40387	Motor, Drive, 115v, 60 Hz, SP, Fam 2
	1	42580	Motor, Drive, 24VAC/DC, 50/60 Hz
	1	40389	Motor, Drive, 220V, 50/60 Hz, SP, Fam 2
8	1	14769	Bracket, Motor, 2900
9	1	40405	Harness, Lower Drive, Sys4, Env
10	1	10302	Insulator, Limit Switch
11	1	10218	Switch, Micro
12	2	19849	Screw, Pan Hd, 4-40 x 5/8
13	1	18746	Bearing, Connecting Rod
14	1	14775	Cam, Drive, 2900
15	1	41022	Pin, Roll, 2900 Lower
16	1	14759	Link, Piston Rod
17	1	10250	Ring, Retaining
18	1	18725	Indicator, Service/Standby
19	1	18726	Spacer, Indicator
20	6	10872	Screw, Hex Wsh, 8-32 X 17/64 18-8 Stainless Steel
21	1	60217-02	Cover Assembly, 2900, Lower, Black, Environmental

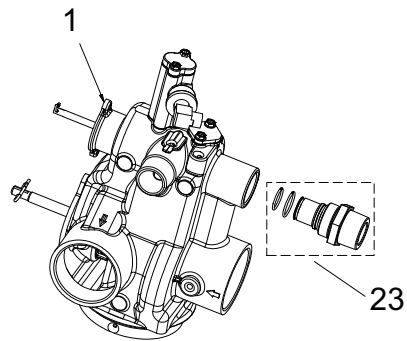
**For Service Assembly Numbers, See the Back of this Manual**



# Control Valve Assembly



Downflow



Upflow

61500-2900\_REVD

For Service Assembly Numbers, See the Back of this Manual

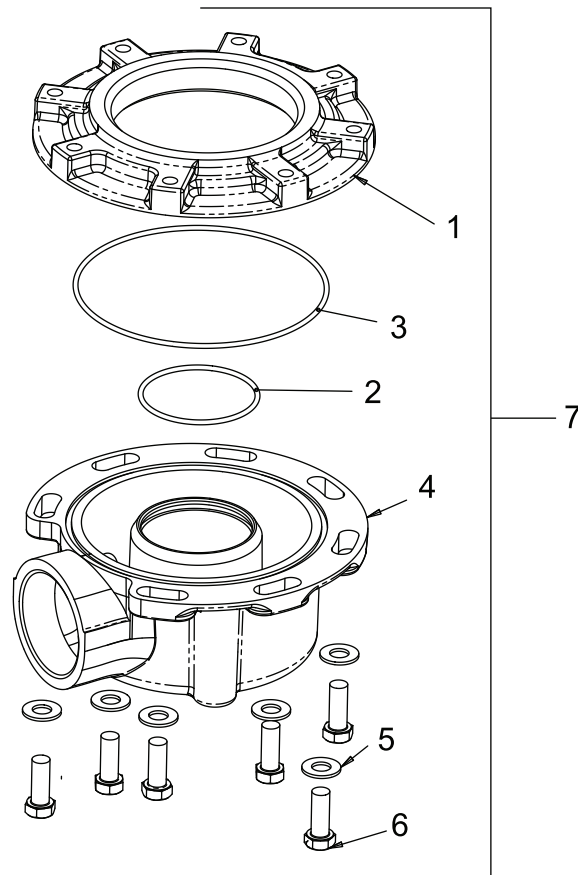
# Control Valve Assembly

Item No.	Quantity	Part No.	Description
1	1	41428-01	Valve Body, 2900s, Machd, NPT U.S. Tap
		41428-09	Valve Body, 2900s, Machined, w/Soft Water Adapter
2	1	10757	Spacer, End
		10757B	Spacer, End, Brass, HW
3	7	10545	Seal, Piston
		10545-01	Seal, Piston, Viton
		10545-02	Seal, Piston, Silicone
4	6	11451	Spacer, 12 Hole
		16589	Spacer, Hot Water
5	1	14451	Piston, 2750
		19454*	Piston, 2750, Upflow
6	1	41424	Rod, Piston, 2900s, Upper
7	1	41131	Plug, End
	1	10212	Plug, End, 1500/2750, Brass
8	1	10909	Pin, Link
9	1	10209	Quad Ring,-010
10	1	40078	O-ring, 28mm X 2mm
		10234-01	O-ring, -024, Hot Water
11	4	11720	Seal, Piston, 2900/3150
		10545-02	Seal, Piston, Silicone
12	2	10369	Spacer, 2", 2900/3150
		14241-01	Spacer, Hot Water
13	1	14753	Spacer, 2900
		16589	Spacer, Hot Water
14	1	14757	Piston, HWBP
		14752	Piston, 2900, NHWBP
15	1	14818	Ring, Piston Rod, Snap
16	1	14758	Rod, Piston, 2900
17	1	14922	O-ring, -035, Piston
18	1	14926	Quad Ring, -012
19	1	14754-00	End Plug Assy, 2900
		14754-01	Plug, End, White, Machined
		14754-10	End Plug Assembly, 2900/2930, NHWBP
		19276-01	End Plug Assembly, 2900s, Brass, HW
		41427-01	Plug, End, 2900s, Lower, White
		41427-11	Plug, End, 2900s, Lower, Black
20	1	14813	Pin, Spring, Connecting Rod
21	1	13575	O-ring, -240
		15210	O-ring, -343, Park Tank
22	1	13577	O-ring, -226
23	1	61525	Softwater Adapter Kit, 2900s
25	2	19925	Gasket, Injector Body, 1700
31	1	11893	Cap, Injector, Stainless Steel
32	2	15137	Screw, Hex Wsh Mach, 10 - 24 x 3/8

\*Upflow Only

**For Service Assembly Numbers, See the Back of this Manual**

# Control Valve Side Mount Adapter



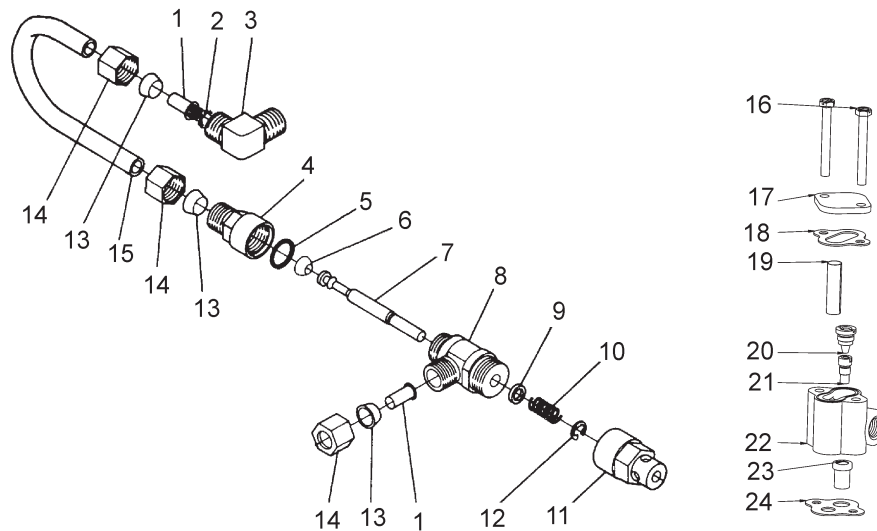
61415\_REVA

Item No.	Quantity	Part No.	Description
1.....	1.....	40316.....	Adapter, Sidemount
2.....	1.....	40372.....	O-ring - 142
3.....	1.....	40368.....	O-ring - 160, Sidemount, Flange
4.....	1.....	40310.....	Base, 2850/2900/3930, Rotating
5.....	7.....	40375.....	Washer, Flat, 3/8, Type A, N-SERS
6.....	7.....	19768.....	Screw, Hex Hd, 3/8 - 16 x 1, Cap 18-8
7.....	1.....	61415.....	Adapter Assy, Sidemount 2850/2900/2930
.....	.....	61415NP.....	Adapter Assy, Sidemount, NP 2850/2900/2930
.....	.....	61415-20.....	Adapter Assy, Sidemount, BSP/MTC 2850/2900/2930
.....	.....	61415-20NP.....	Adapter Assy, Sidemount, BSP/NP 2850/2900/2930

For Service Assembly Numbers, See the Back of this Manual



# 1600 Brine System



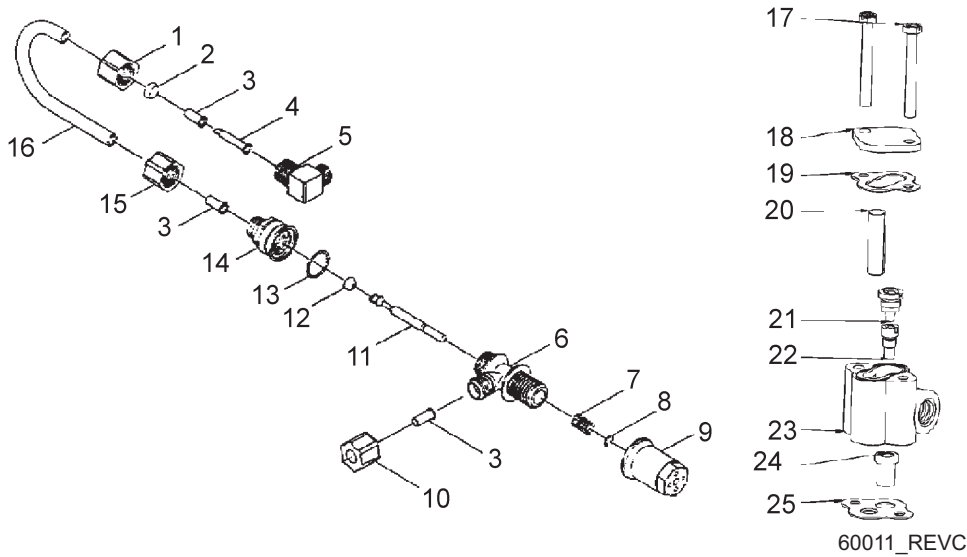
60029

Item No.	Quantity	Part No.	Description
1	2	10332	Fitting, Insert, 3/8
2	1	12767	Screen, Brine
3	1	10328	Fitting, Elbow, 90 Deg. 1/4 PT x 3/8 Tube
4	1	60020-25	BLFC, .25 GPM, 1600
4	1	60020-50	BLFC, .50 GPM, 1600
4	1	60020-100	BLFC, 1.0 GPM, 1600
5	1	11982	O-ring, -.016
6	1	12626	Seat, Brine Valve
7	1	12552	Brine Valve Stem, 1600
8	1	12748	Brine Valve Body Assy, 1600 w/Quad Ring
9	1	12550	Quad Ring, -.009
10	1	10249	Spring, Brine Valve
11	1	11749	Guide, Brine Valve Stem
12	1	10250	Ring, Retaining
13	3	10330	Fitting, Sleeve, 3/8 Celcon
14	3	10329	Fitting, Tube, 3/8 Nut, Brass
15	1	16508-01	Tube, Brine Valve, 2850/2900
	1	12774	Tube, Brine Valve, 1500
	1	40027	Tube, Brine Valve, 2510
	1	15221	Tube, Brine Valve, 2750
	1	42184	Tube, Brine Valve, 2850s
	1	41683*	Tube, Brine Valve, UF, 1600/1650
16	2	10692	Screw, Slot Hex Hd, 10 - 24X 18-8 Stainless Steel
17	1	11893	Cap, Injector, Stainless Steel
18	1	10229	Gasket, Injector Cap, 1600
19	1	10227	Screen, Injector
20	1	10913-xx	Nozzle, Injector, -xx means injector size
21	1	10914-xx	Throat, Injector, -xx means injector size
22	1	17776	Body, Injector, 1600
	1	17776-02*	Body, Injector, 1600 Upflow
23	1	16221	Disperser, Air
24	1	14805	Gasket, Injector Body, 1600/1700

\*Upflow Only

**For Service Assembly Numbers, See the Back of this Manual**

# 1650 Brine System Assembly



Item No.	Quantity	Part No.	Description
1.....	1.....	10329.....	Fitting, Tube, 3/8 Nut, Brass
2.....	1.....	10330.....	Fitting, Sleeve, 3/8 Celcon
3.....	3.....	10332.....	Fitting, Insert, 3/8
4.....	1.....	12767.....	Screen, Brine
5.....	1.....	10328.....	Fitting, Elbow, 90 Deg 1/4 NPT x 3/8T
6.....	1.....	17884.....	Brine Valve Body Assembly, 1650
7.....	1.....	10249.....	Spring, Brine Valve
8.....	1.....	10250.....	Ring, Retaining
9.....	1.....	17906.....	Guide, Brine Valve Stem
10.....	1.....	19625.....	Nut Assy, 3/8", Plastic
11.....	1.....	12552-02.....	Brine Valve Stem, 1600, with Seat
12.....	1.....	12626.....	Seat, Brine Valve
13.....	1.....	16924.....	O-ring, -018
14.....	1.....	60020-25.....	BLFC, 1650, .25 GPM, Plastic
.....	1.....	60020-50.....	BLFC, 1650, .50 GPM, Plastic
.....	1.....	60020-100.....	BLFC, 1650, 1.0 GPM, Plastic
15.....	1.....	19625.....	Nut Assembly, 3/8", Plastic
16.....	1.....	16508-01.....	Tube, Brine Valve, 2850/2900
.....	1.....	40027.....	Tube, Brine Valve, 2510
.....	1.....	42184.....	Tube, Brine Valve, 2850s
.....	1.....	12774.....	Tube, Brine Valve, 1500
.....	1.....	15221.....	Tube, Brine Valve, 2750
.....	1.....	41683*.....	Tube, Brine Valve, UF, 1600/1650
17.....	2.....	10692.....	Screw, Slot Hex Hd, 10 - 24X 18-8 Stainless Steel
18.....	1.....	11893.....	Cap, Injector, Stainless Steel
19.....	1.....	10229.....	Gasket, Injector Cap, 1600
20.....	1.....	10227.....	Screen, Injector
21.....	1.....	10913-xx.....	Nozzle, Injector, -xx means injector size
22.....	1.....	10914-xx.....	Throat, Injector, -xx means injector size
23.....	1.....	17776.....	Body, Injector, 1600
.....	1.....	17776-02*.....	Body, Injector, 1600 Upflow
24.....	1.....	16221.....	Dispenser, Air
25.....	1.....	14805.....	Gasket, Injector Body, 1600/1700

\*Upflow Only

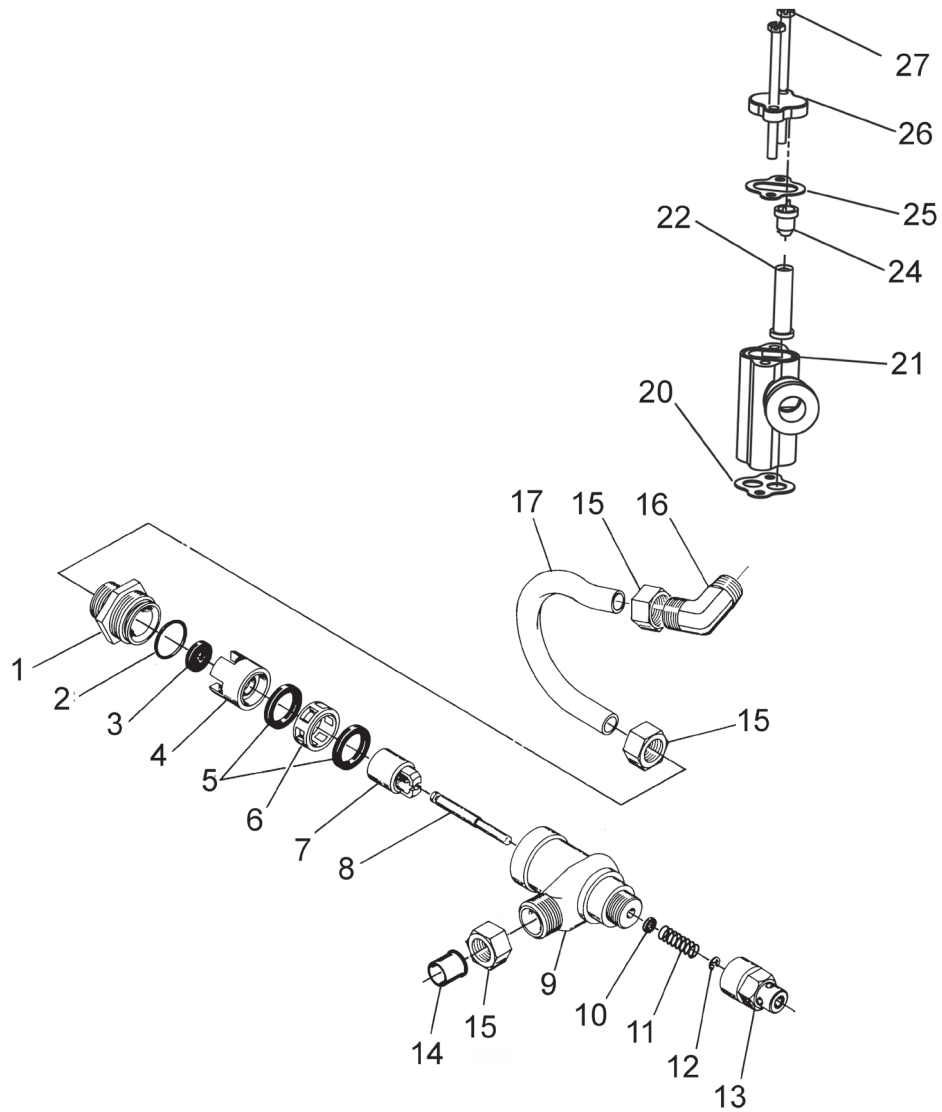
**For Service Assembly Numbers, See the Back of this Manual**



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# 1700 Brine System Assembly

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60034\_REVB

**For Service Assembly Numbers, See the Back of this Manual**

# 1700 Brine System Assembly

Item No.	Quantity	Part No.	Description
1	1	14792	Plug, End, Brine Valve
2	1	13201	Quad Ring, -020
3	1	12085	Washer, Flow, 1.2 GPM
	1	12086	Washer, Flow, 1.5 GPM
	1	12087	Washer, Flow, 2.0 GPM
	1	12088	Washer, Flow, 2.4 GPM
	1	12089	Washer, Flow, 3.0 GPM
	1	12090	Washer, Flow, 3.5 GPM
	1	12091	Washer, Flow, 4.0 GPM
	1	12092	Washer, Flow, 5.0 GPM
4	1	14785	Retainer, Flow Control
5	3	14811	O-ring, -210, 560CD, Brine
6	1	14798	Spacer, 1700, Brine
7	1	14795	Piston, Brine Valve
8	1	14797	Brine Valve Stem
9	1	14790	Brine Valve Body
10	1	12550	Quad Ring, -009
11	1	15310	Spring, Brine Valve
12	1	10250	Retaining Ring
13	1	15517	Guide, Stem
14	1	15415	Fitting, Insert, 1/2", Tube
15	2	15414	Nut, 2900, w/Sleeve
16	1	15413	Fitting, Elbow, Male, 1/2T x 3/8 NPT
17	1	15416	Tube, Brine, 2900/2750
	1	16460	Tube, Brine, 2850/2900s
	1	41447*	Tube, Brine, 2900s, U/F
	1	42183	Tube, Brine, 1700, 2850s
20	1	14805	Gasket, Injector Body, 1600/1700
21	1	17777	Body, Injector, 1700
	1	17777-02*	Body, Injector, 1700 U/F
22	1	14802-xxc	Throat, Injector, -xxc is for Injector Size
24		14801-xxc	Nozzle, Injection, -xxc is for Injector Size
25	1	10229	Gasket, Injector Cap, 1600
26	1	11893	Cap, Injector, SS
	1	10228	Cap, Injector
27	2	14804	Screw, Hex Hd Mach, 10 - 24 x 2 3/4" 18-8 SS

**Not Shown:**

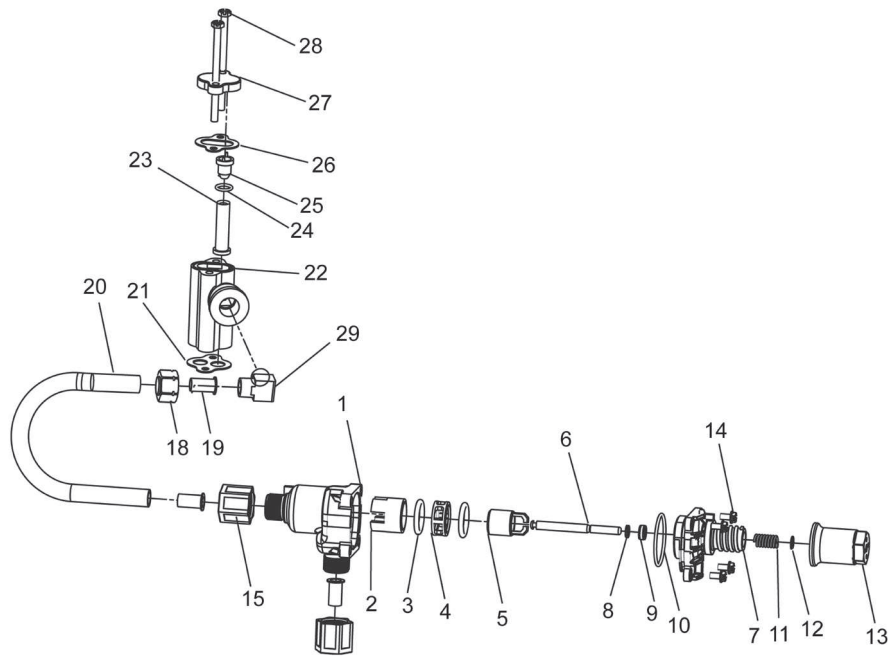
	1	16974	Fitting, Plastic, Female, 3/4 x 3/4 Slip
	1	17996	Dispenser, Air, Injector

\*Upflow Only

**NOTE:** Item number 26 (11893) is used on injector sizes 2 through 5C. Part number 10228 is used on injector sizes 6C.

**For Service Assembly Numbers, See the Back of this Manual**

# 1710 Brine System Assembly



60604\_REV F

Item No.	Quantity	Part No.	Description
1	1	41202	Brine Valve, 1700, Plastic, Top
2	1	14785-01	Retainer, Flow Control
3	-	14811	O-Ring, -210, 560CD, Brine
4	1	14798	Spacer, 1700, Brine
5	1	14795	Piston, Brine Valve
6	1	41203	Stem, Brine, 1710, Plastic, 2900
7	1	41201	Brine Valve, 1700, Plastic, Bottom
8	5	17908	Sleeve, Brine Valve Stem
9	1	12550	Quad Ring, -009
10	3	41547	O-Ring, 2mmx35mm
11	2	15310	Spring, Brine Valve
12	2	10250	Ring, Retaining
13	1	17906	Guide, Brine Valve Stem
14	2	14202-01	Screw, Hex Wsh Mach, 8-32 X 5/16
15	2	41056	Nut Assembly, 1/2" Plastic
18	1	15414	Nut, 2900, w/Sleeve
19	1	15415	Fitting, Insert, 1/2", Tube
20	1	15416	Tube, Brine, 2900, Old Style/2750
	1	16460	Tube, Brine, 2850, 2900s
	1	41447*	Tube, Brine, 2900s, U/F
	1	42183	Tube, Brine, 1700, 2850s
21	1	19925	Gasket, Injector Body, 1700
22	1	17777	Body, Injector, 1700
	1	17777-02	Body, Injector, 1700, Up Flow
23	1	14802-xxc	Throat, Injector, -xxc means Injector Size
24	1	13771	O-ring, -012
25	1	14801-xxc	Nozzle, Injector, -xxc means Injector Size
26	1	10229	Gasket, Injector Cap, 1600
27	1	10228	Cap, Injector
28	2	14804	Screw, Hex Head Mach, 10 - 24 x 2 3/4
29	1	15413	Fitting, Elbow, Male, 1/2T X 3/8NPT

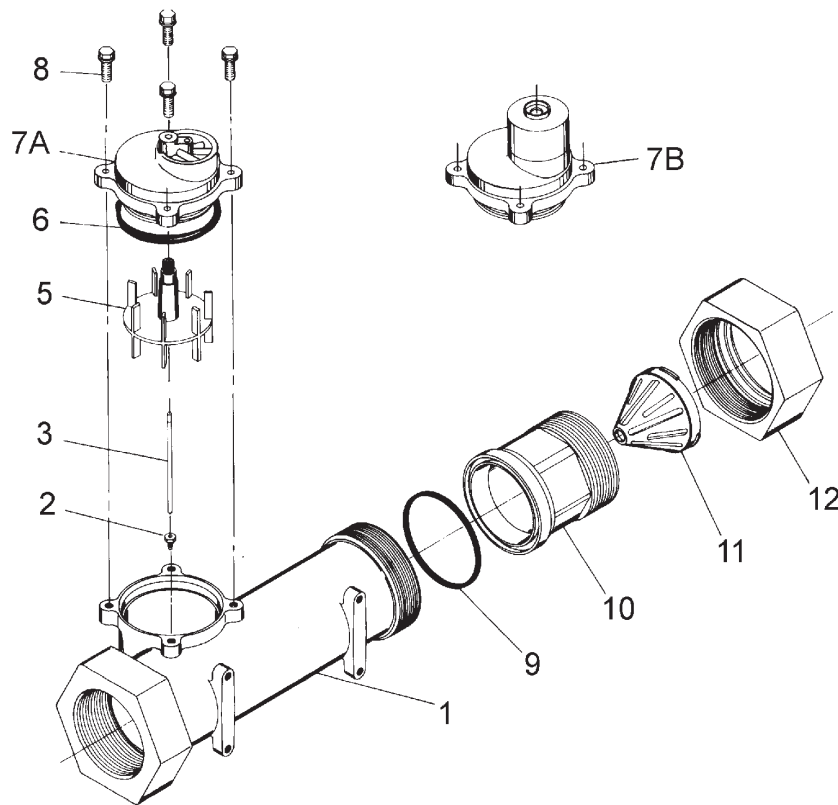
\*Upflow Only

**Not Shown:**

	1	17996	Dispenser, Air, Injector
	1	41493-00	Label, Blank, BLFC, 1710

**For Service Assembly Numbers, See the Back of this Manual**

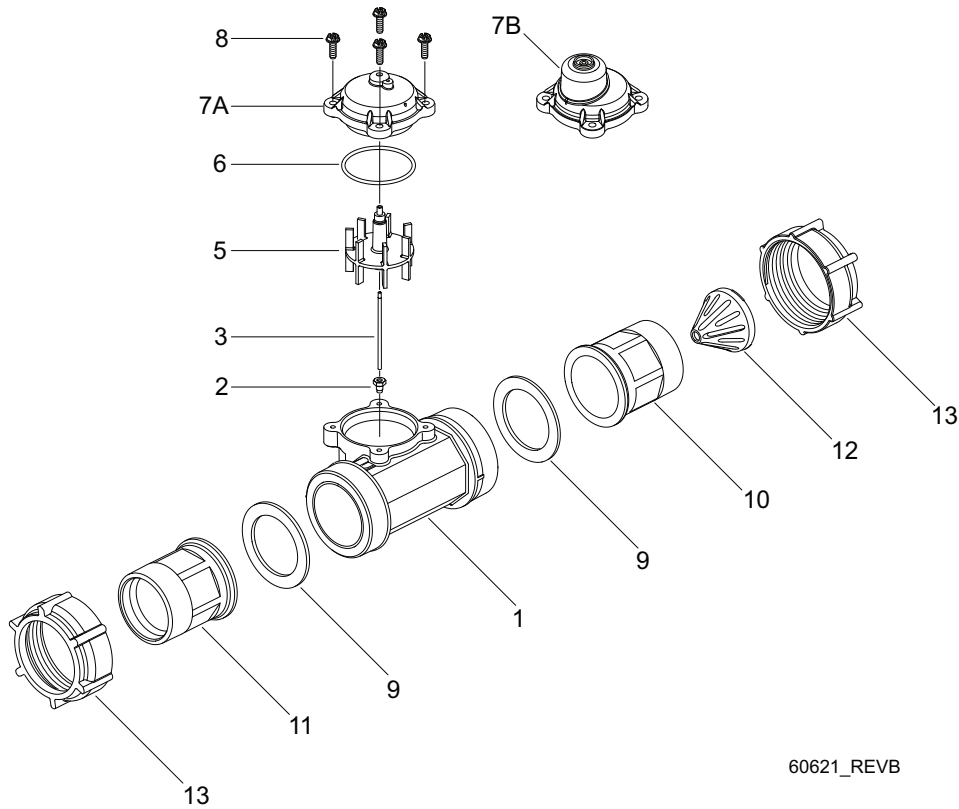
## 2" Brass Meter Assembly



Item No.	Quantity	Part No.	Description
1.....	1 .....	14456.....	Body, Meter, 2"
2.....	1 .....	15532.....	Seat, Impeller Shaft, Hex
3.....	1 .....	15432.....	Shaft
5.....	1 .....	15374.....	Impeller Assy, 2" Meter
6.....	1 .....	13847.....	O-ring, -137, Std/560CD, Meter
7A.....	1 .....	14038.....	Meter Cap Assembly, Std, Plastic
7B.....	1 .....	15150.....	Meter Cap Assembly, 3/4" to 2", Ext Plastic, Pdl
8.....	4 .....	12112.....	Screw, Hex Hd Mach, 10-24 x 1/2 18-8 Stainless STeel
9.....	1 .....	14679.....	O-ring, -227, Meter
10.....	1 .....	14568.....	Fitting, Nipple, 2"
11.....	1 .....	14680.....	Flow Straightener
12.....	1 .....	14569.....	Nut, 2900 Meter

**For Service Assembly Numbers, See the Back of this Manual**

# 2" Plastic Meter Assembly



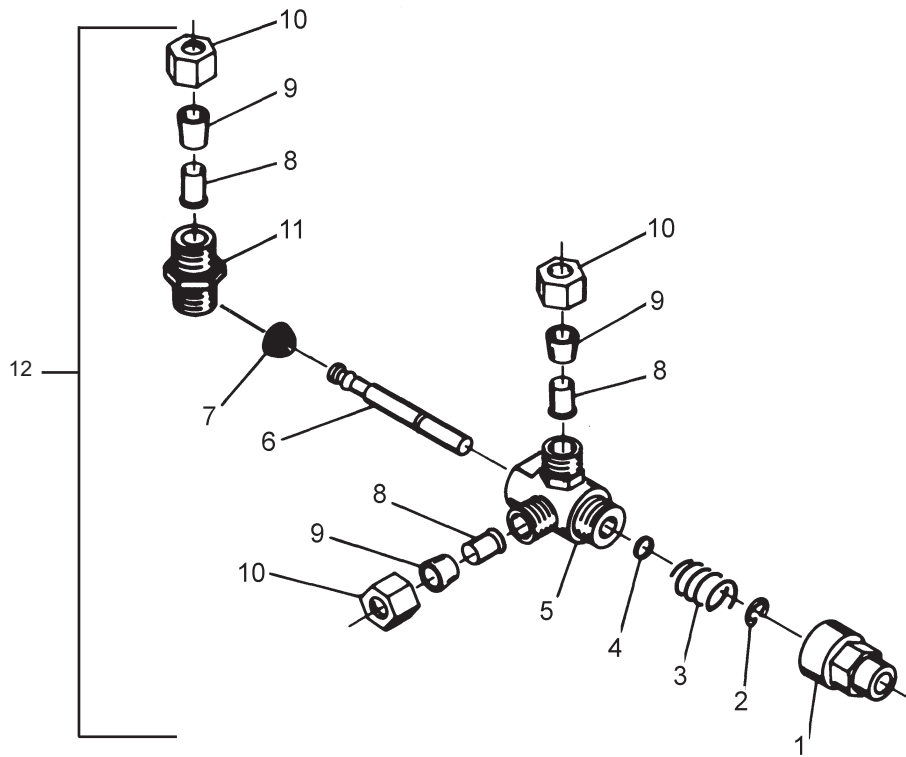
60621\_REV B

Item No.	Quantity	Part No.	Description
1.....	1 .....	17689 .....	Body, Meter, 2" Plastic w/Impeller Shaft Seat
2.....	1 .....	15532 .....	Seat, Impeller Shaft, Hex
3.....	1 .....	15432 .....	Shaft, Impeller, Stainless Steel
5.....	1 .....	15374 .....	Impeller Assy, 2" Meter
6.....	1 .....	13847 .....	O-ring, -137, Std/560CD, Meter
7A .....	1 .....	14038 .....	Meter Cap Assembly
7B .....	1 .....	15150 .....	Meter Cap Assembly, Ext
8.....	4 .....	12473 .....	Screw, Hex Wsh, 10-24 x 5/8 18-8 Stainless Steel
9.....	2 .....	40666 .....	Seal, Face, 2", Plastic Meter
10A .....	1 .....	17987-001 .....	Fitting, Nipple, 2", Plastic, NPT, Machined, .....Flow Straightener
10B .....	1 .....	17987-101 .....	Fitting, Nipple, 2", Plastic, BSP, Machined, .....Flow Straightener
11A.....	1 .....	17987-000 .....	Fitting, Nipple, 2", Plastic, NPT
11B .....	1 .....	17987-100 .....	Fitting, Nipple, 2", Plastic, BSP
12.....	1 .....	14680 .....	Flow Straightener
13.....	2 .....	17988 .....	Nut, 2" Meter

For Service Assembly Numbers, See the Back of this Manual



# 1600 Service Valve Operator Assembly (Old Style)

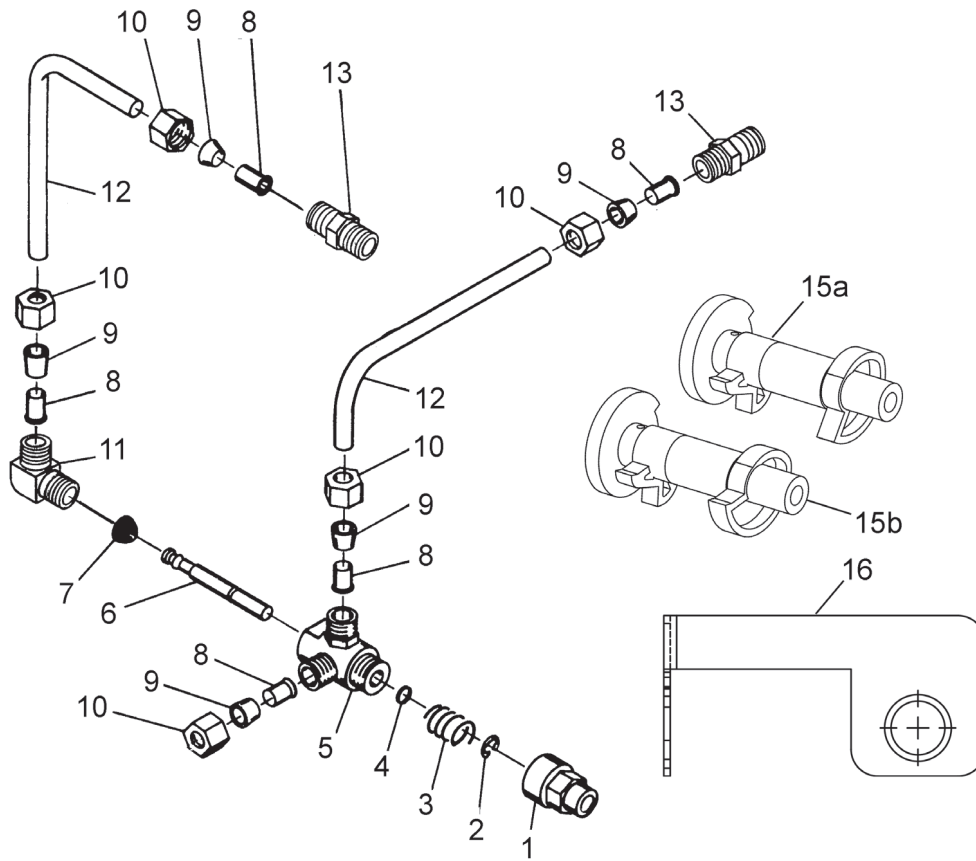


60150\_REVA

Item No.	Quantity	Part No.	Description
1.....	1.....	11749.....	Guide, Brine Valve Stem
2.....	1.....	10250.....	Ring, Retaining
3.....	1.....	10249.....	Spring, Brine Valve
4.....	1.....	12550.....	Quad Ring, -009
5.....	1.....	10785.....	SVO Body Assy Brass Valves
6.....	1.....	12552.....	Brine Valve Stem, 1600
7.....	1.....	12626.....	Seat, Brine Valve
8.....	3.....	10332.....	Fitting, Insert, 3/8
9.....	3.....	10330.....	Fitting, Sleeve, 3/8 Celcon
10.....	3.....	10329.....	Fitting, Tube, 3/8 Nut, Brass
11.....	1.....	10331.....	Fitting, Compression, 1/4" x 3/8"
12.....	1.....	60150.....	SVO, Assembly, Old Style

**For Service Assembly Numbers, See the Back of this Manual**

# 1600 Service Valve Operator (New Style)

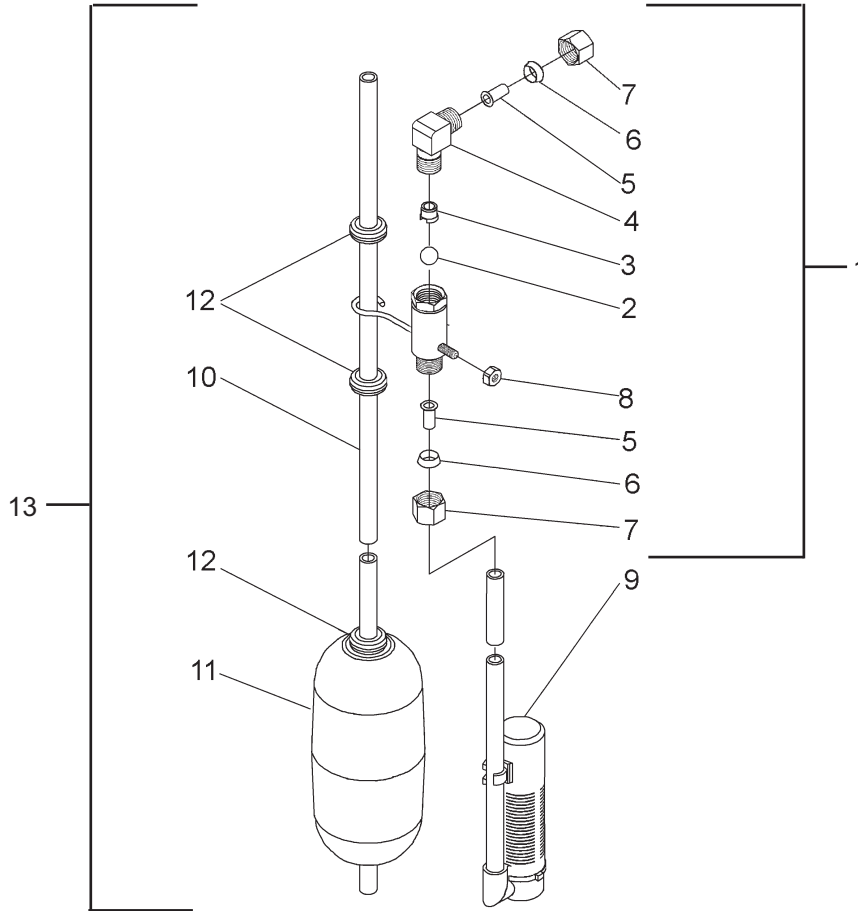


60150REVA

Item No.	Quantity	Part No.	Description
1	1	11749	Guide, Brine Valve Stem
2	1	10250	Ring, Retaining
3	1	10249	Spring, Brine Valve
4	1	12550	Quad Ring, -009
5	2	10785	SVO Body Assy Brass Valves
6	1	12552	Brine Valve Stem, 1600
7	1	12626	Seat, Brine Valve
8	5	10332	Fitting, Insert, 3/8
9	5	10330	Fitting, Sleeve, 3/8" Celcon
10	5	10329	Fitting, Tube, 3/8 Nut, Brass
11	1	10328	Fitting, Elbow, 90 Deg 1/4 NPT x 3/8 Tube
12	2	12897	Tube, Fitting, 3/8 x 9 3/4
13	1	16730	Fitting, Male, 1/4 x 1
14	2	15415	Fitting, Insert, 1/2" Tube
15a	1	12472	Cam Assembly, Tri-Stack, After RR
15b	1	15770	Cam Assembly, Special Tri-Stack After Brine Fill
16	1	12114	Bracket, Motor Outboard, Coated
17	1	60150-01	Service Valve Operator Assembly, 1600, New Style, Item No's 1-11

**For Service Assembly Numbers, See the Back of this Manual**

# 2300 Safety Brine Valve

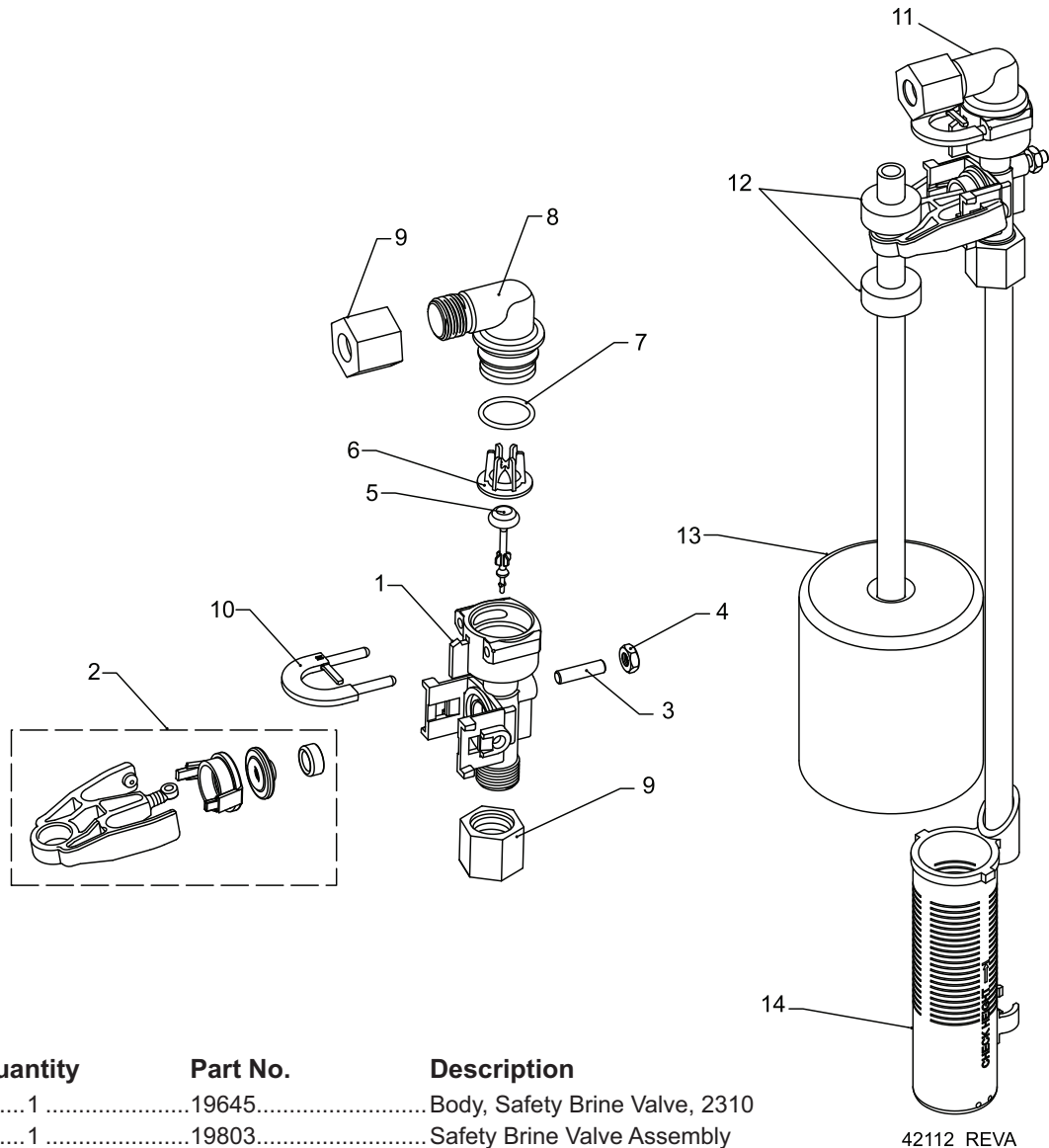


60027REVA

Item No.	Quantity	Part No.	Description
1	1	60027-FF	Safety Brine Valve Body, 2300, Fitting Facing Arm
1A	1	60027-FFS	Safety Brine Valve Body, 2300, Fitting Facing Stud
2	1	10138	Ball, 3/8", Brass
3	1	11566	Ball Stop, Slow Fill
4	1	10328	Fitting, Elbow, 90 Deg. 1/4 NPT x 3/8 Tube
5	1	10332	Fitting, Insert, 3/8
6	1	10330	Fitting, Sleeve, 3/8 Celcon
7	1	10329	Fitting, Tube, 3/8 Nut, Brass
8	1	10186	Nut, Hex, 10-32
9	1	60002-34	Air Check, #500, 34" Long
		60003-34	Air Check, #500, HW, 34" Tube
10	1	10149	Rod, Float
11	1	10700	Float Assembly, White
12	3	10150	Grommet, .30 Dia
13	1	60028-30	Float Assembly, White
13A	1	60028-30SAN	Float Assembly, San, Hot Water

**For Service Assembly Numbers, See the Back of this Manual**

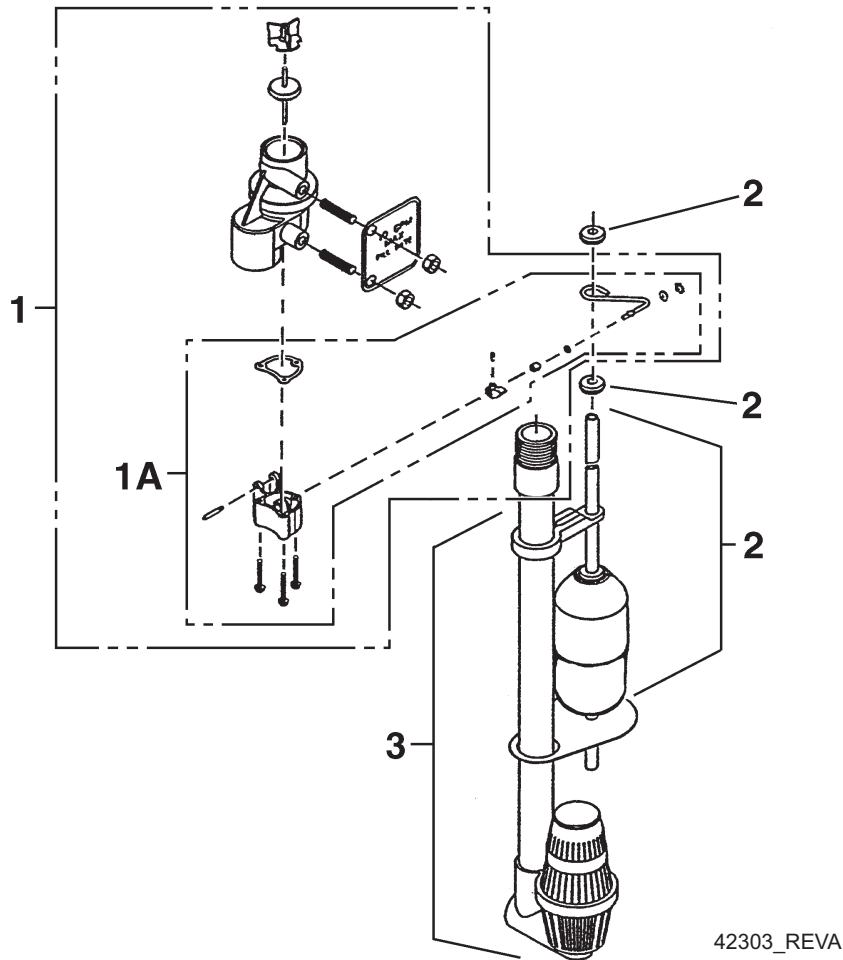
# 2310 Safety Brine Valve



Item No.	Quantity	Part No.	Description
1	1	19645	Body, Safety Brine Valve, 2310
2	1	19803	Safety Brine Valve Assembly
3	1	19804	Screw, Sckt Hd, Set, 10-24 x .75
4	1	19805	Nut, Hex, 10-24, Nylon Black
5	1	19652-01	Poppet Assy, SBV w/O-ring
6	1	19649	Flow Dispenser
7	1	11183	O-ring, -017
8	1	19647	Elbow, Safety Brine Valve
9	2	19625	Nut Assembly, 3/8" Plastic
10	1	18312	Retainer, Drain
11	1	60014	Safety Brine Valve Assembly, 2310
12	2	10150	Grommet, .30 Dia
13	1	60068-30	Float Assembly, 2310, w/30" Rod
14	1	60002-34	Air Check, #500, 34" Long

**For Service Assembly Numbers, See the Back of this Manual**

# 2350 Safety Brine Valve Assembly



Item No.	Quantity	Part No.	Description
1.....	1 .....	60038 .....	Safety Brine Valve, 2350
1A .....	1 .....	61024 .....	Actuator Assembly, 2350 Brine
2.....	1 .....	60028-30 .....	Float Assembly, 2350, 30" Wht
.....	1 .....	60026-30SAN .....	Float Assembly, 2350, 30", HW
3.....	1 .....	60009-00 .....	Air Check, #900, Commercial Less Fittings
.....	1 .....	60009-01 .....	Air Check, #900, Commercial, HW Less Fittings

**Not Shown:**

.....	1 .....	18603 .....	Fitting Assembly, 900 Air Check 2350
.....	1 .....	18602 .....	Fitting Assembly, 900 Air Check

**For Service Assembly Numbers, See the Back of this Manual**

# Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
1. Water conditioner fails to regenerate.	A. Electrical service to unit has been interrupted	A. Assure permanent electrical service (check fuse, plug, pull chain, or switch)
	B. Timer is defective.	B. Replace timer.
	C. Power failure.	C. Reset time of day.
2. Hard water.	A. By-pass valve is open.	A. Close by-pass valve.
	B. No salt is in brine tank.	B. Add salt to brine tank and maintain salt level above water level.
	C. Injector screen plugged.	C. Clean injector screen.
	D. Insufficient water flowing into brine tank.	D. Check brine tank fill time and clean brine line flow control if plugged.
	E. Hot water tank hardness.	E. Repeated flushings of the hot water tank is required.
	F. Leak at distributor tube.	F. Make sure distributor tube is not cracked. Check O-ring and tube pilot.
	G. Internal valve leak.	G. Replace seals and spacers and/or piston.
3. Unit used too much salt.	A. Improper salt setting.	A. Check salt usage and salt setting.
	B. Excessive water in brine tank.	B. See problem 7.
4. Loss of water pressure.	A. Iron buildup in line to water conditioner.	A. Clean line to water conditioner.
	B. Iron buildup in water conditioner.	B. Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration.
	C. Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	C. Remove piston and clean control.
5. Loss of mineral through drain line.	A. Air in water system.	A. Assure that well system has proper air eliminator control. Check for dry well condition.
	B. Improperly sized drain line flow control.	B. Check for proper drain rate.
6. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash, brine draw, and brine tank fill. Increase frequency of regeneration. Increase backwash time.
7. Excessive water in brine tank.	A. Plugged drain line flow control.	A. Clean flow control.
	B. Plugged injector system.	B. Clean injector and screen.
	C. Timer not cycling.	C. Replace timer.
	D. Foreign material in brine valve.	D. Replace brine valve seat and clean valve.
	E. Foreign material in brine line flow control.	E. Clean brine line flow control.

Problem	Cause	Correction
8. Softener fails to draw brine.	A. Drain line flow control is plugged.	A. Clean drain line flow control.
	B. Injector is plugged.	B. Clean injector
	C. Injector screen plugged.	C. Clean screen.
	D. Line pressure is too low.	D. Increase line pressure to 20 P.S.I.
	E. Internal control leak	E. Change seals, spacers, and piston assembly.
	F. Service adapter did not cycle.	F. Check drive motor and switches.
9. Control cycles continuously.	A. Misadjusted, broken, or shorted switch.	A. Determine if switch or timer is faulty and replace it, or replace complete power head.
10. Drain flows continuously.	A. Valve is not programming correctly.	A. Check timer program and positioning of control. Replace power head assembly if not positioning properly.
	B. Foreign material in control.	B. Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	C. Internal control leak.	C. Replace seals and piston assembly.

## General Service Hints For Meter Control

### Problem: Softener delivers hard water

**Reason:** Reserve capacity has been exceeded.

**Correction:** Check salt dosage requirements and reset program wheel to provide additional reserve.

**Reason:** Program wheel is not rotating with meter output.

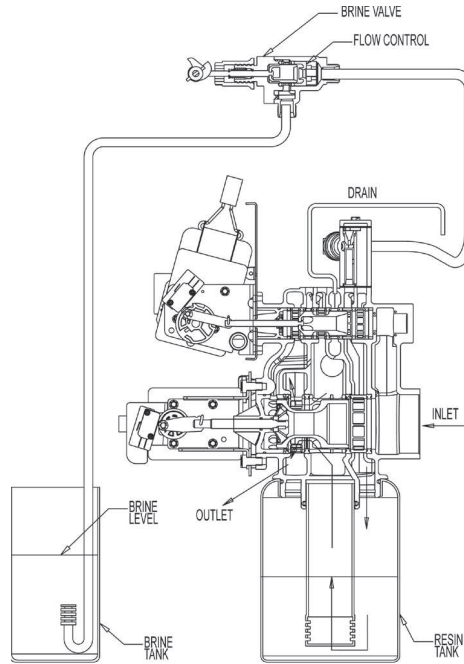
**Correction:** Pull cable out of meter cover and rotate manually. Program wheel must move without binding and clutch must give positive clicks when program wheel strikes regeneration stop. If it does not, replace timer.

**Reason:** Meter is not measuring flow.

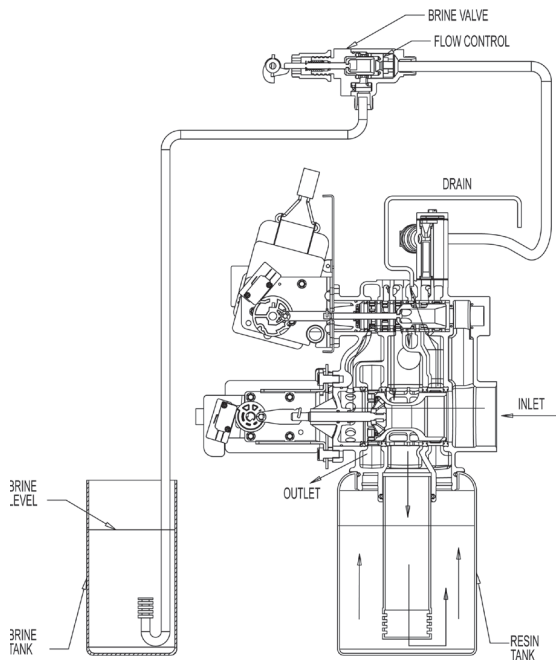
**Correction:** Check meter with meter checker.

# Water Conditioner Flow Diagrams - Downflow

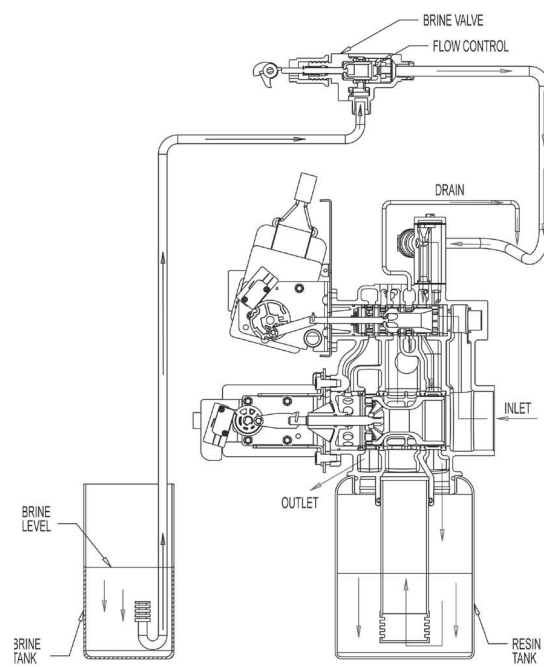
## 1 Service Position



## 2 Backwash Position



## 3 Brine Position

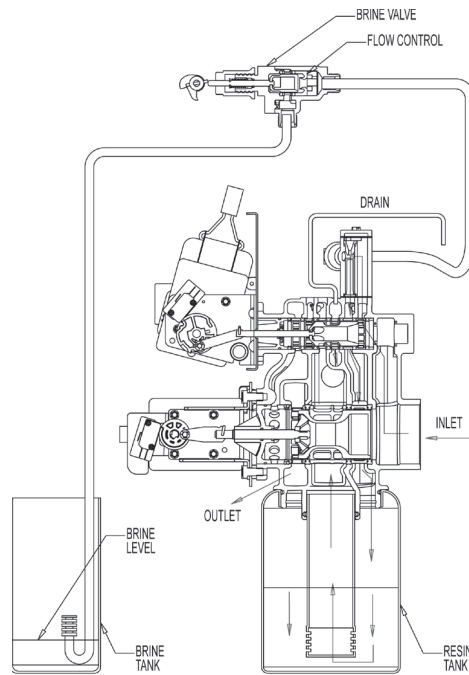


61500-2900 DOWNFLW\_REV B

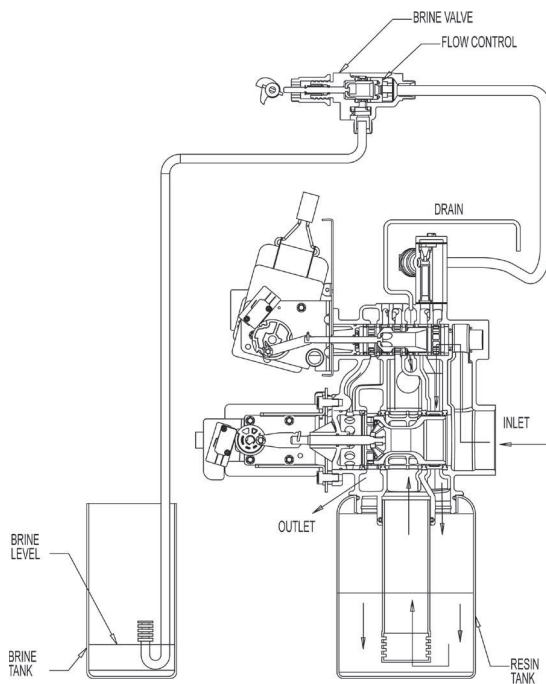


# Water Conditioner Flow Diagrams - Downflow

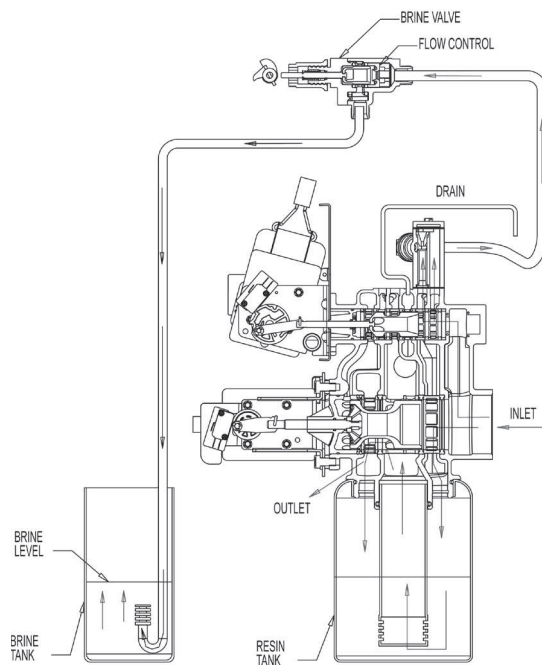
## 4 Slow Rinse Position



## 5 Rapid Rinse



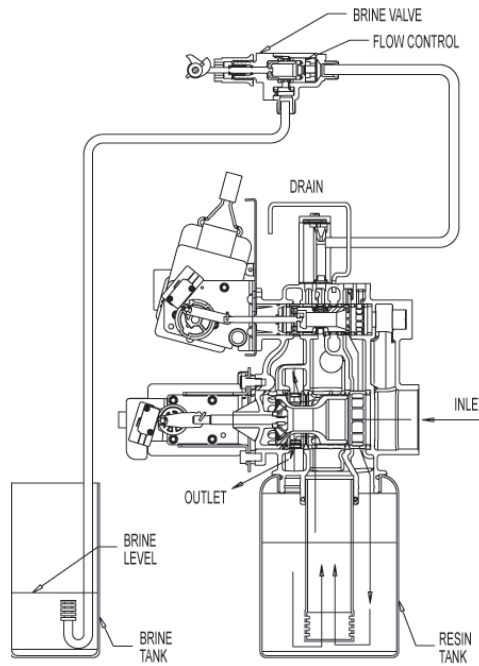
## 6 Brine Tank Refill Position



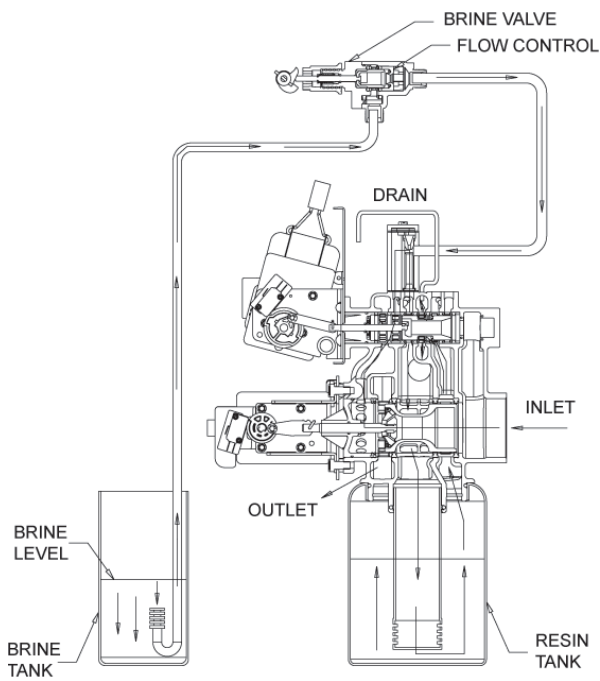
61500-2900 DOWNFLW\_REVB

# Water Conditioner Flow Diagrams - Upflow

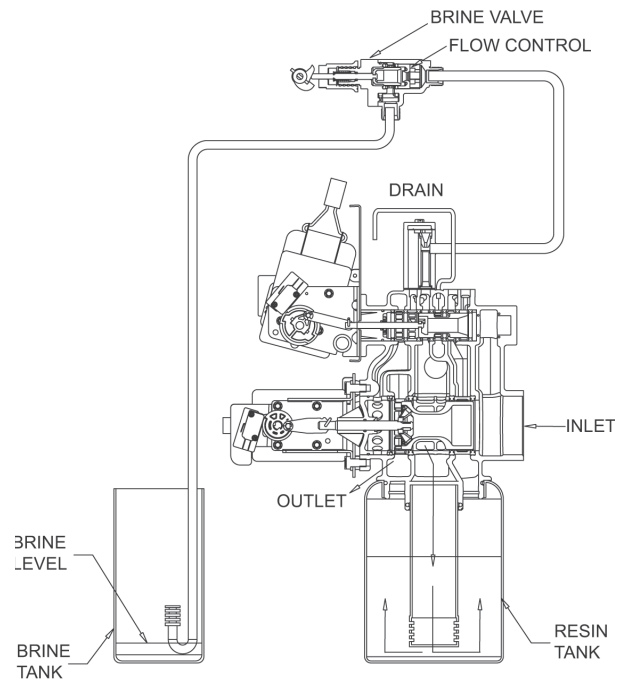
## 1 Service Position



## 2 Brine Position



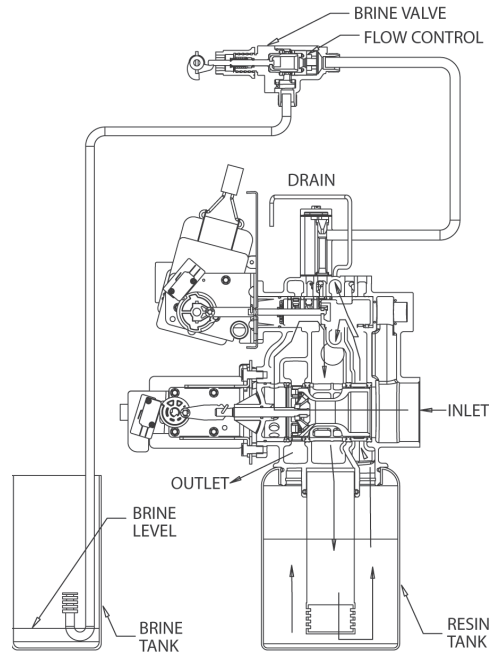
## 3 Slow Rinse Position



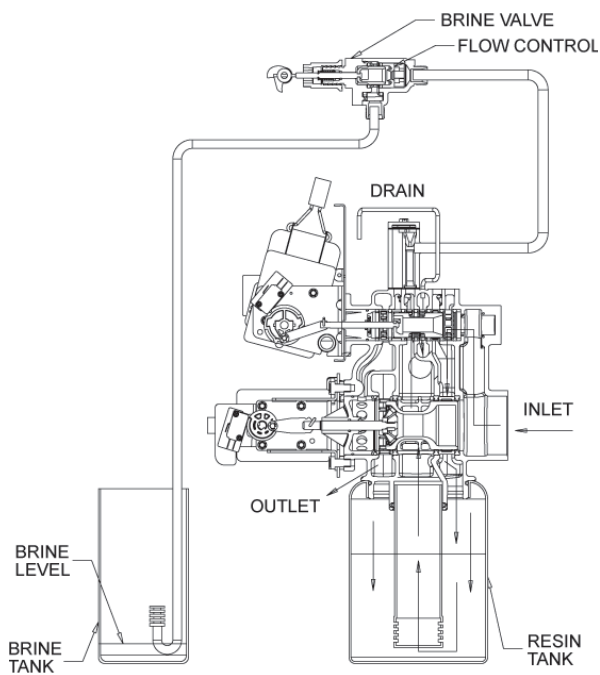
61500-2900 UPFLW\_REVB

# Water Conditioner Flow Diagrams - Upflow

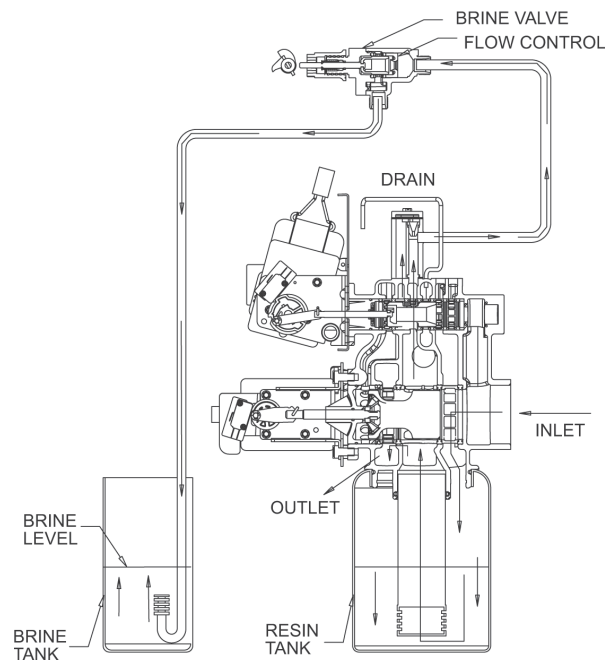
## 4 Back Wash Position



## 5 Rapid Rinse

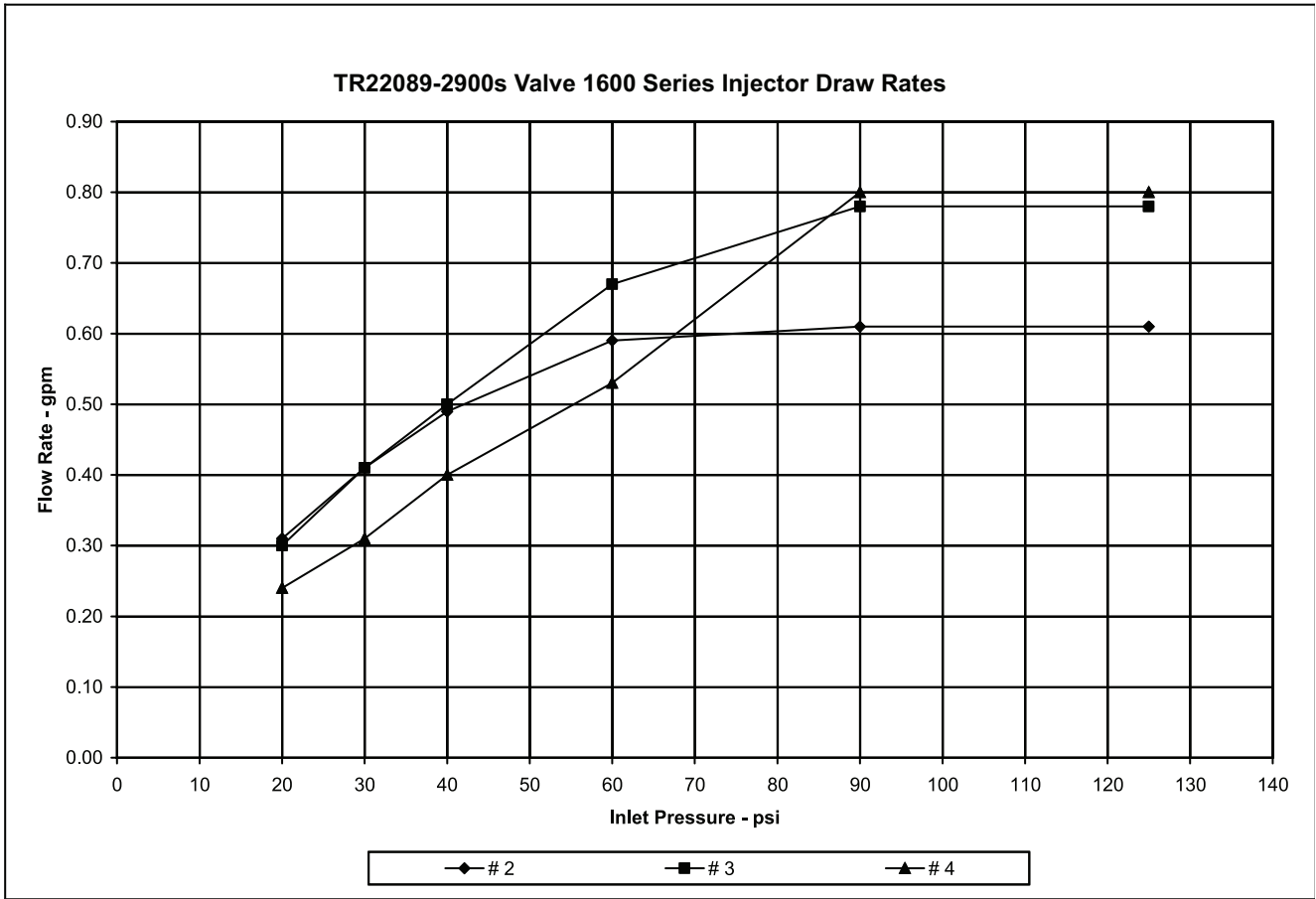


## 6 Brine Tank Fill Position



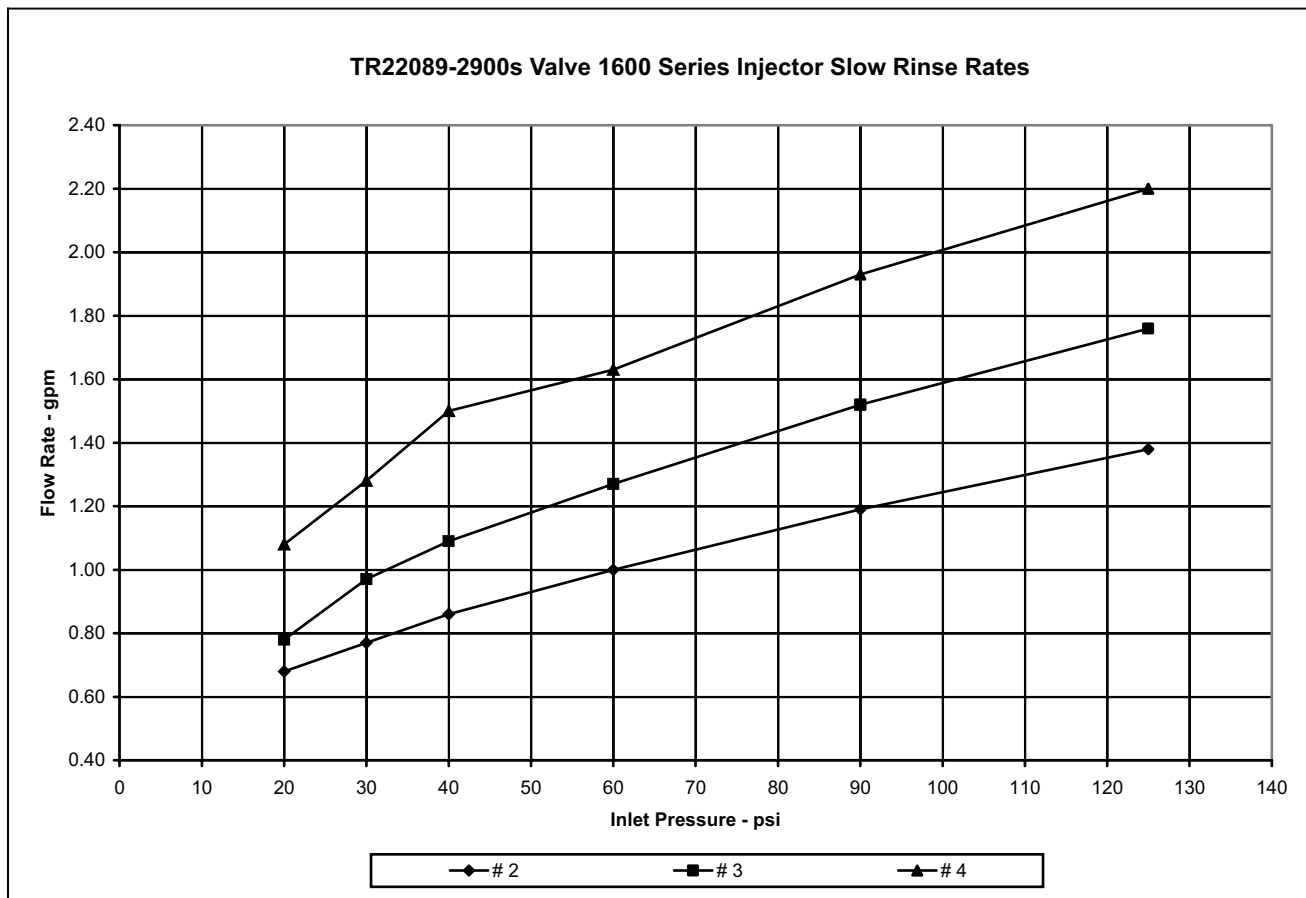
61500-2900 UPFLW\_REV B

# Flow Data & Injector Draw Rates - Downflow



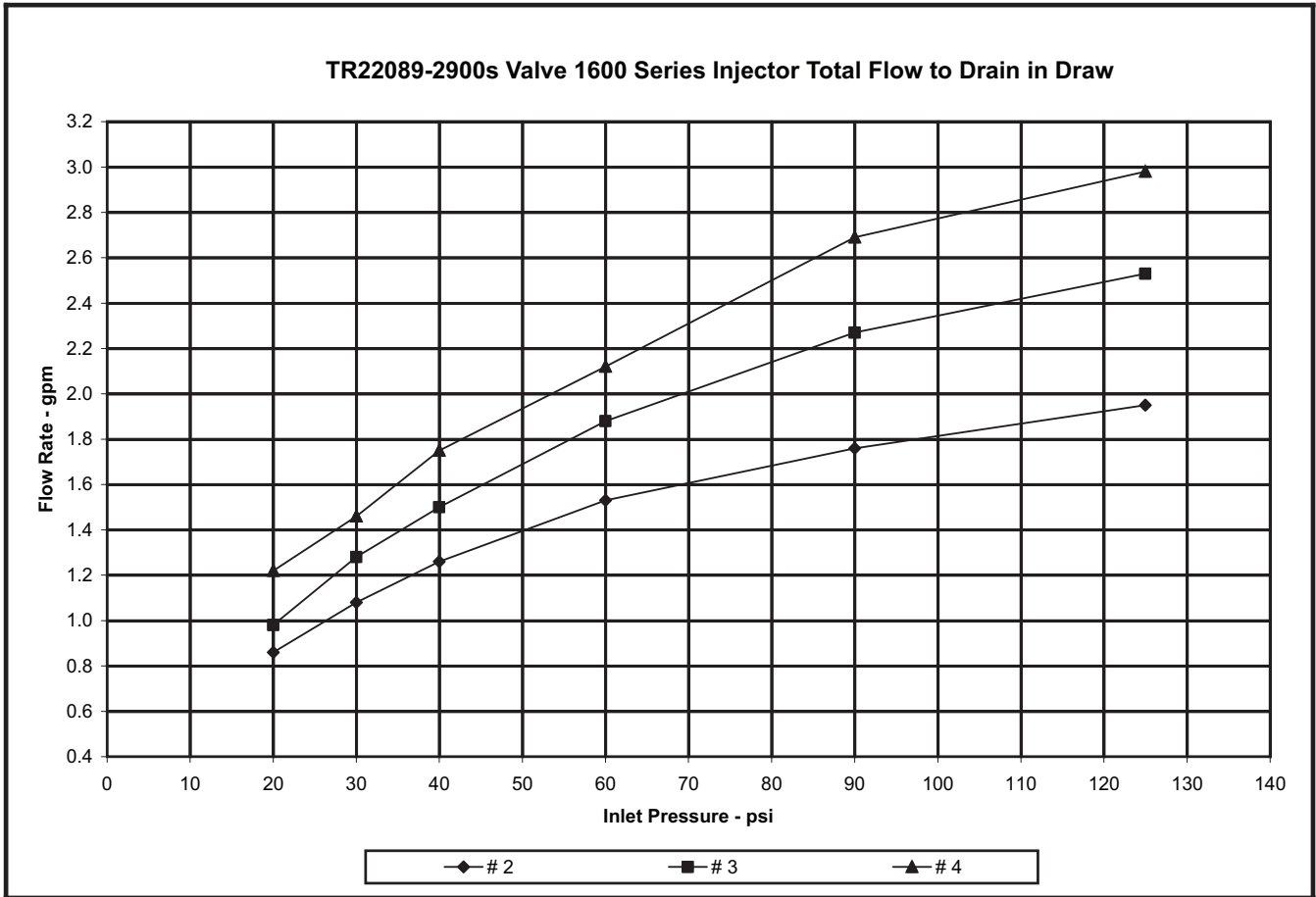
1600 series injectors	Draw Rate - gpm		
	# 2	# 3	# 4
pressure			
20	0.31	0.30	0.24
30	0.41	0.41	0.31
40	0.49	0.50	0.40
60	0.59	0.67	0.53
90	0.61	0.78	0.80
125	0.61	0.78	0.80
all injectors used the steel cap and an air disperser			

## Flow Data & Injector Draw Rates - Downflow

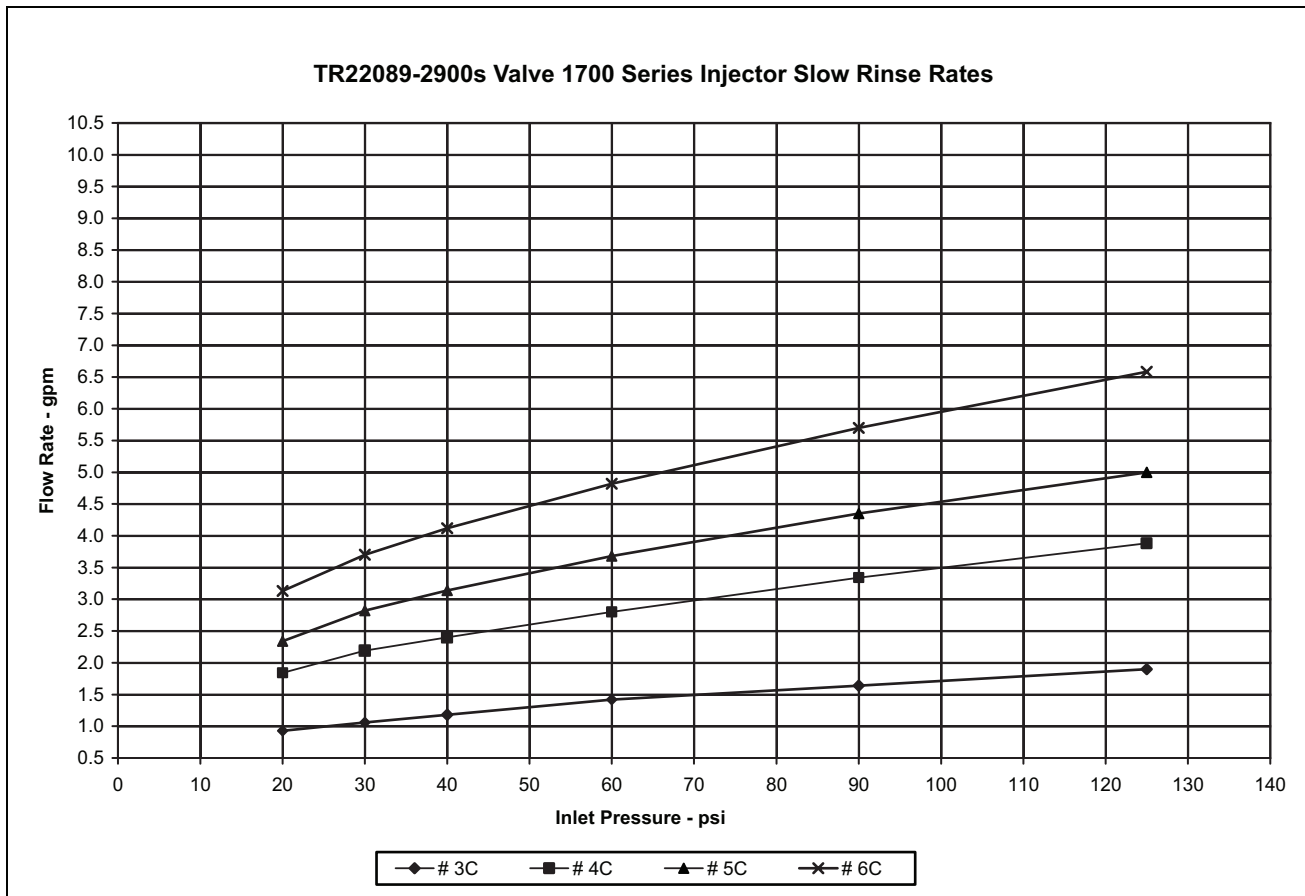


1600 series injectors	Slow Rinse Rates - gpm		
pressure	# 2	# 3	# 4
20	0.68	0.78	1.08
30	0.77	0.97	1.28
40	0.86	1.09	1.50
60	1.00	1.27	1.63
90	1.19	1.52	1.93
125	1.38	1.76	2.20
all injectors used the steel cap and an air disperser			

# Flow Data & Injector Draw Rates - Downflow



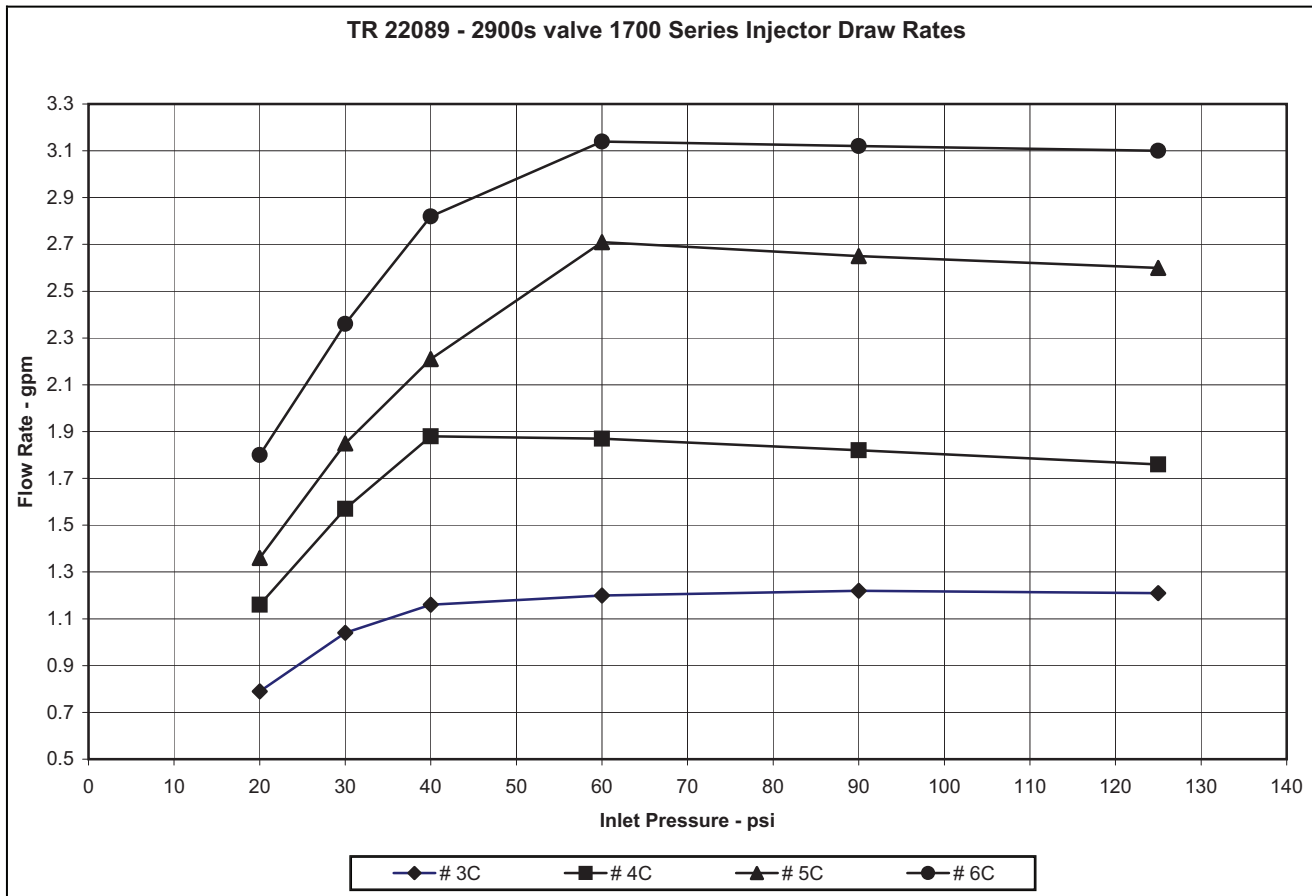
## Flow Data & Injector Draw Rates - Downflow



1700 series injectors	Slow Rinse - gpm			
pressure	# 3C	# 4C	# 5C	# 6C
20	0.93	1.84	2.34	3.13
30	1.06	2.19	2.82	3.70
40	1.18	2.40	3.14	4.12
60	1.42	2.80	3.68	4.82
90	1.64	3.34	4.35	5.70
125	1.90	3.88	5.00	6.58

# 3C - steel cap, no o-ring, air disperser  
 # 4C & 5C - steel cap, o-ring, air disperser  
 # 6C & 7C - brass cap, o -ring, no air disperser

# Flow Data & Injector Draw Rates - Downflow



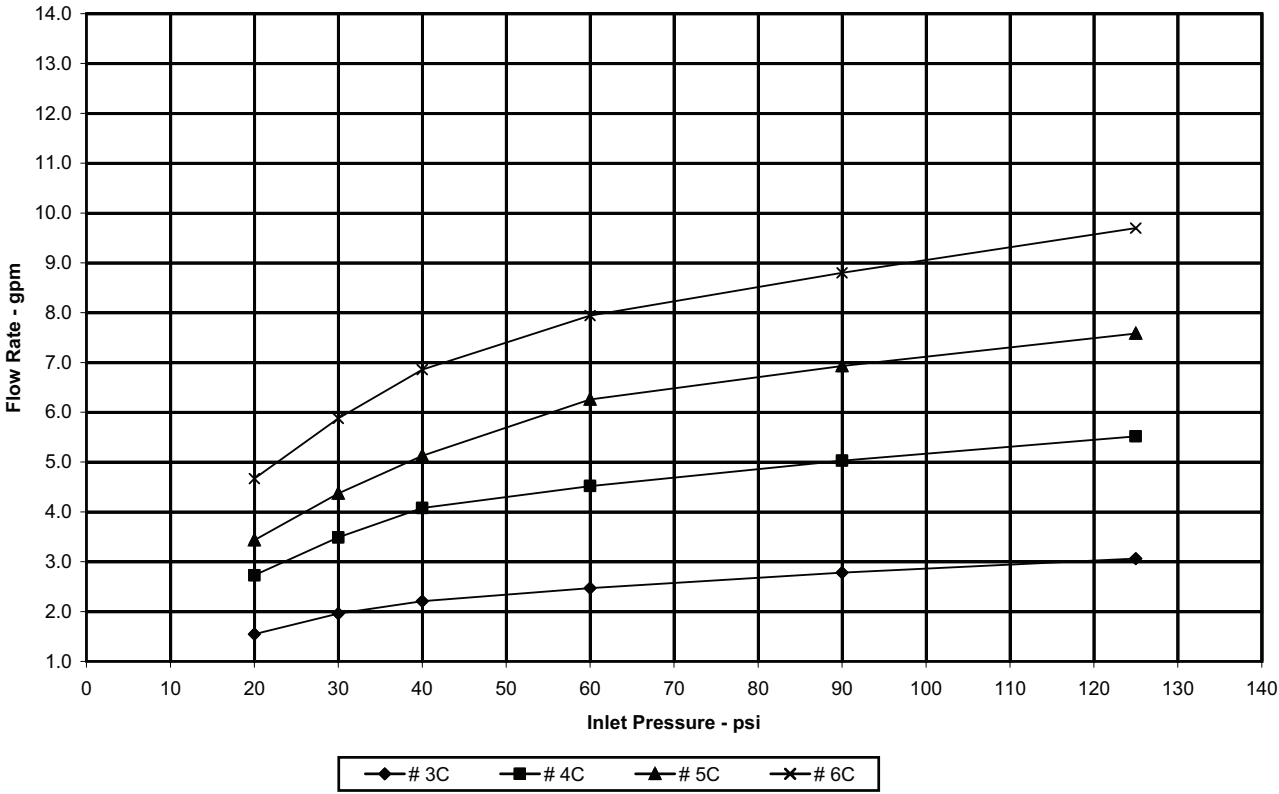
1700 series injectors	Draw Rate - gpm			
pressure	# 3C	# 4C	# 5C	# 6C
20	0.79	1.16	1.36	1.80
30	1.04	1.57	1.85	2.36
40	1.16	1.88	2.21	2.82
60	1.20	1.87	2.71	3.14
90	1.22	1.82	2.65	3.12
125	1.21	1.76	2.60	3.10

# 3C - steel cap, no o-ring, air disperser  
 # 4C & 5C - steel cap, o-ring, air disperser  
 # 6C - brass cap, o -ring, no air disperser

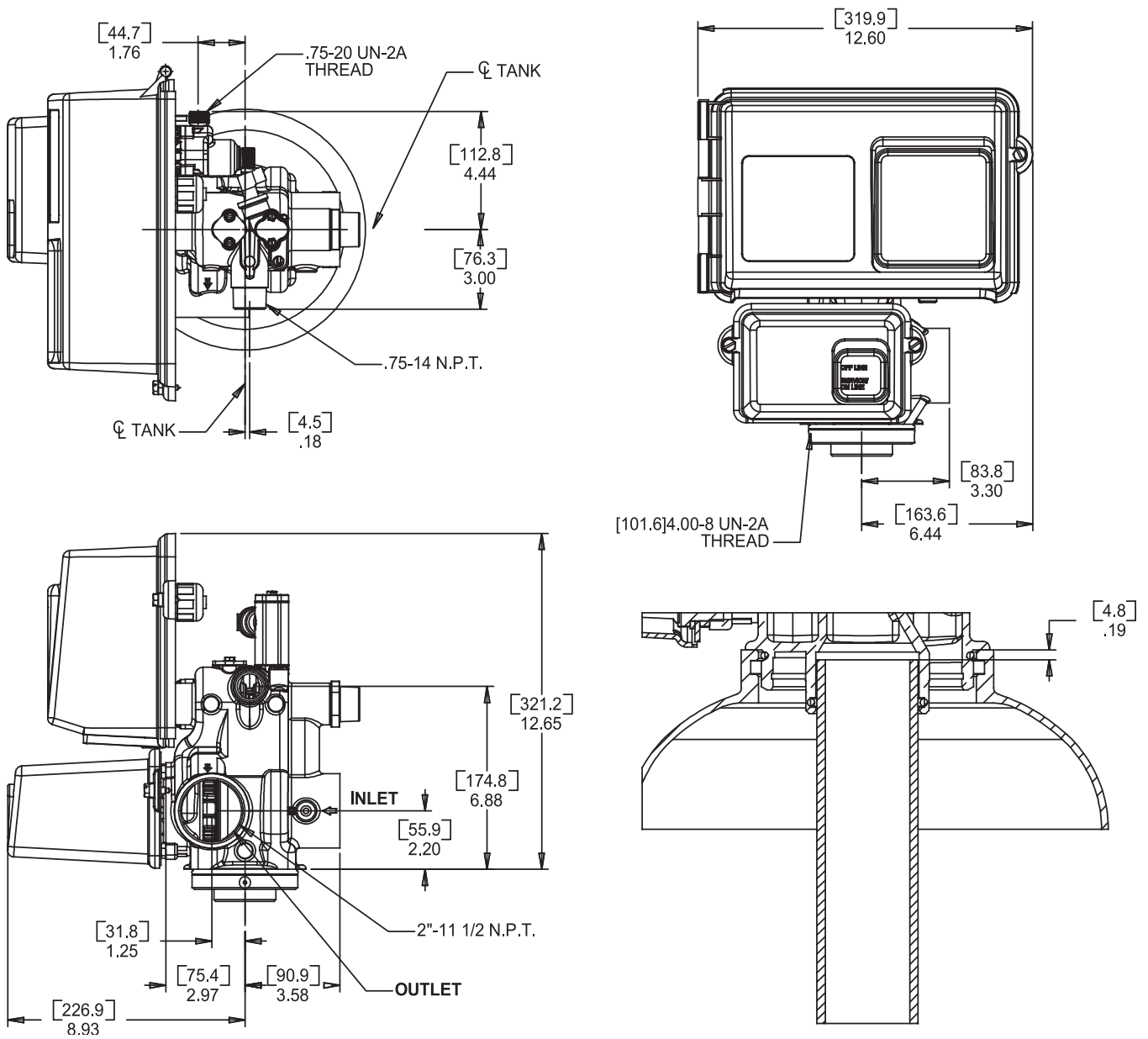


# Flow Data & Injector Draw Rates - Downflow

TR22089-2900s Valve 1700 Series Injector Total Flow to Drain in Draw

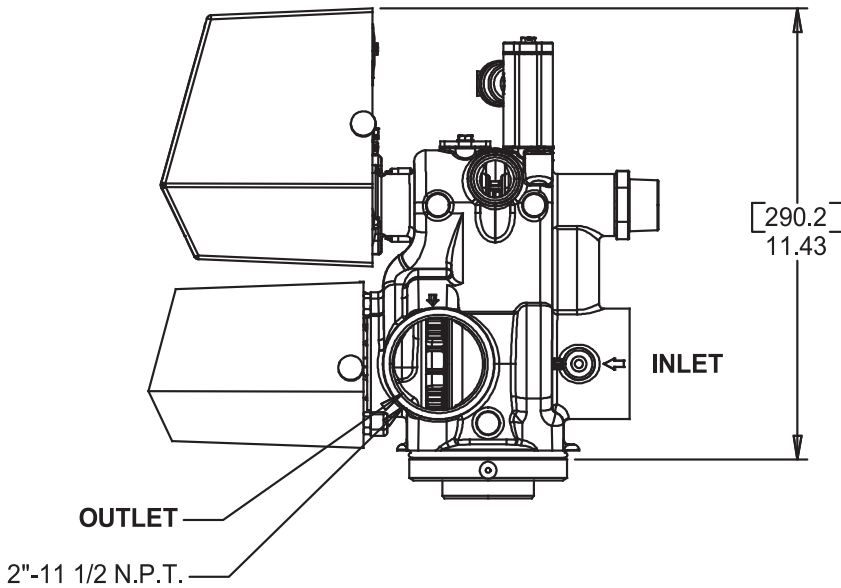
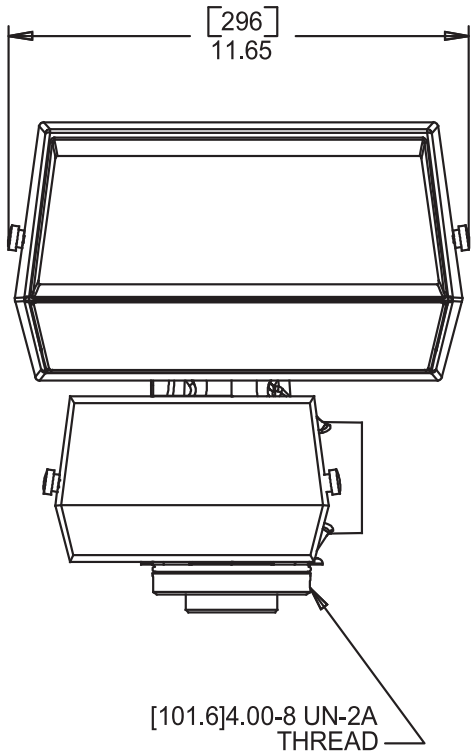
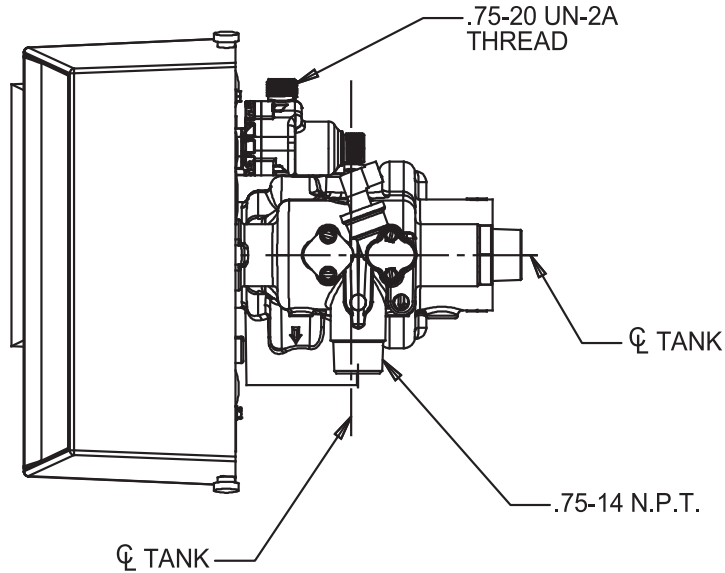


# Environmental Backplate Dimensions



61500-2900LNE\_REV B

# Designer Backplate Dimensions



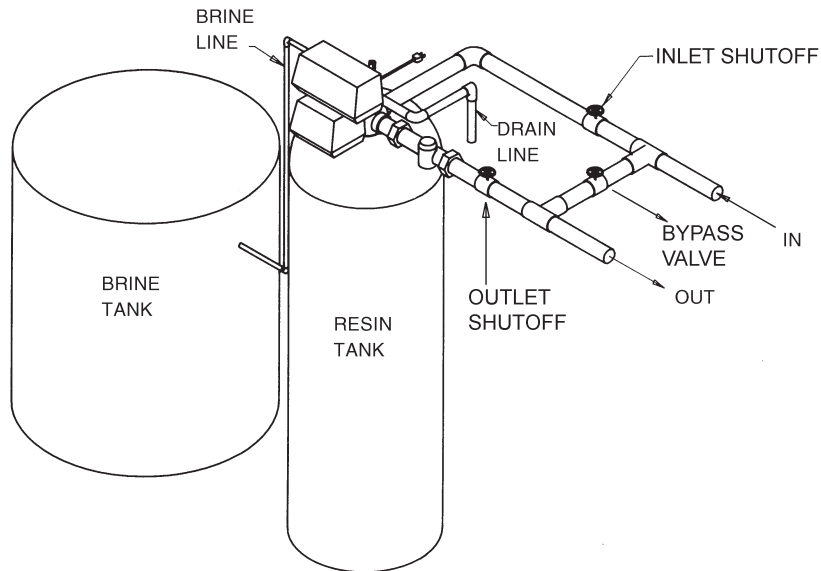
61500-2900LNE\_REVB

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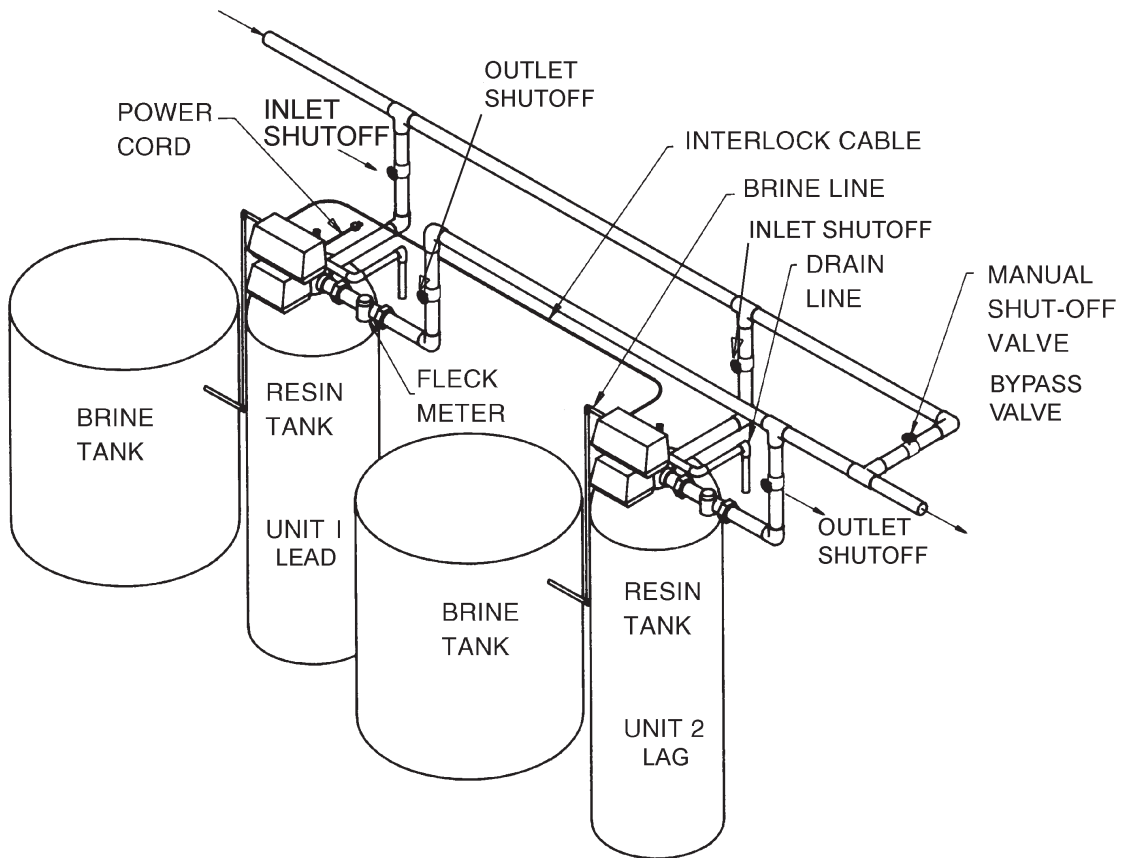
# Plumbing Diagrams

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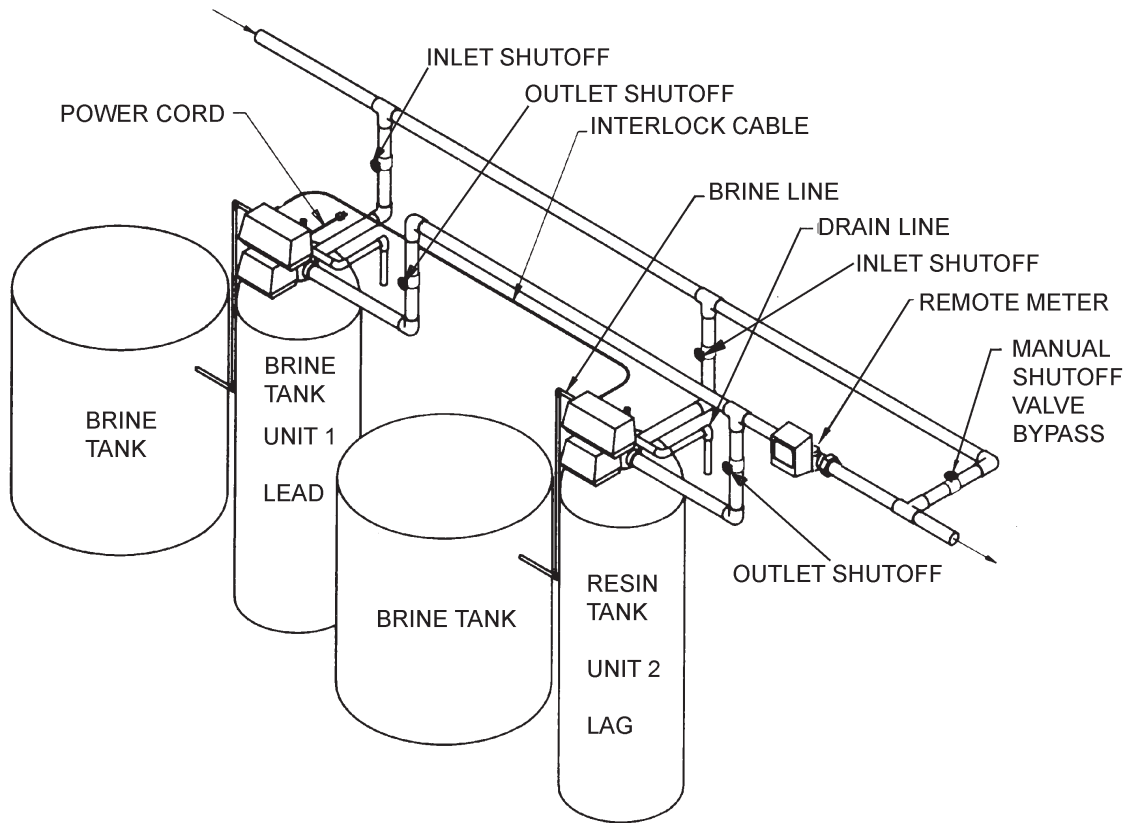
## System #4 - Typical Single Tank Installation With Optional Meter



## System #5 - Interlock - Typical Twin Tank Installation With Optional Meter Interlock And No Hard Water Bypass



## System #6 - Twin Series Regeneration & System #7 - Twin Alternator Installation

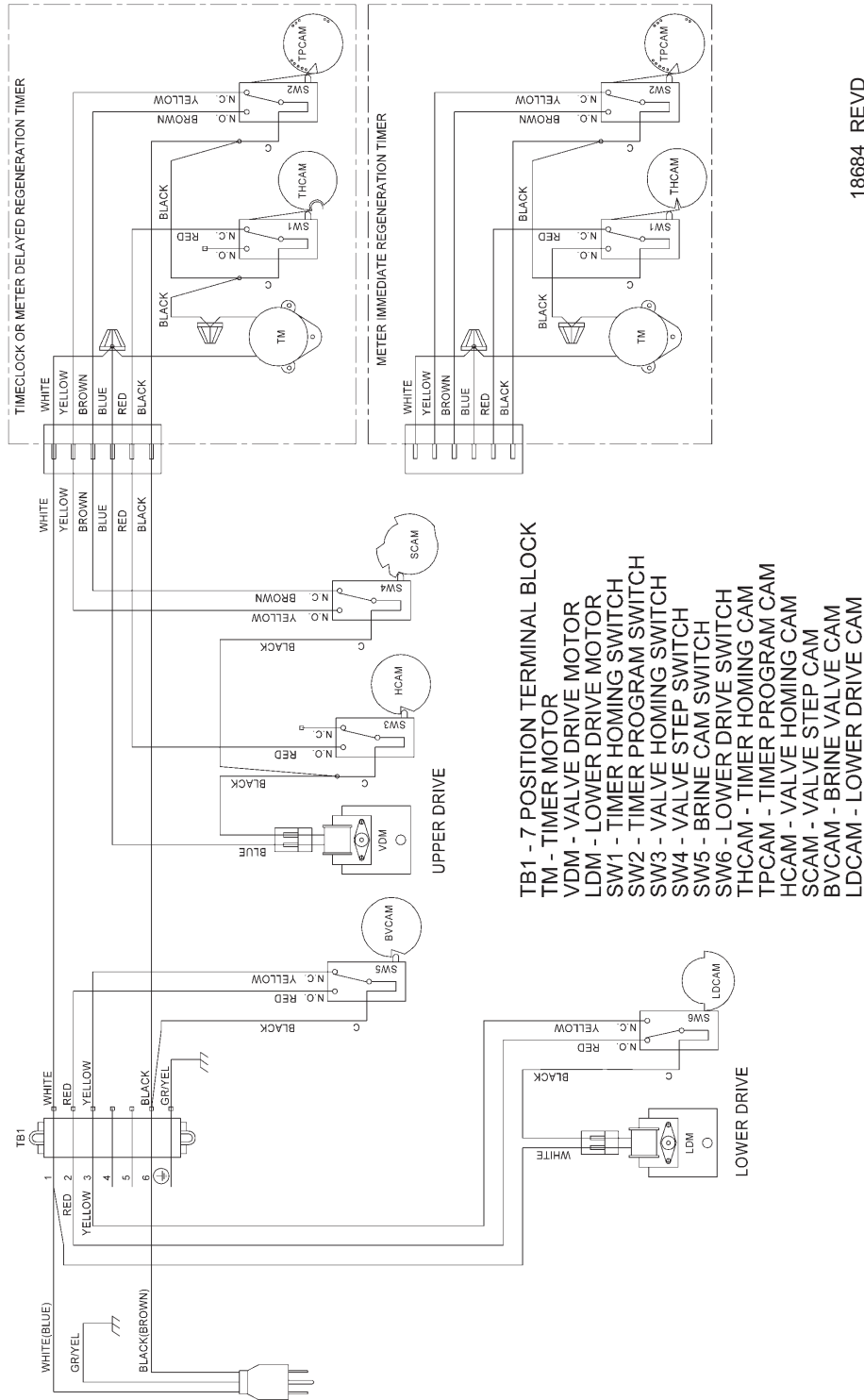


**NOTE:** On System 7, the power cord is on unit 2.

**NOTE:** System 7 can run with either one or two brine tanks. Two brine tanks should be used if regeneration is less than 4 hours.

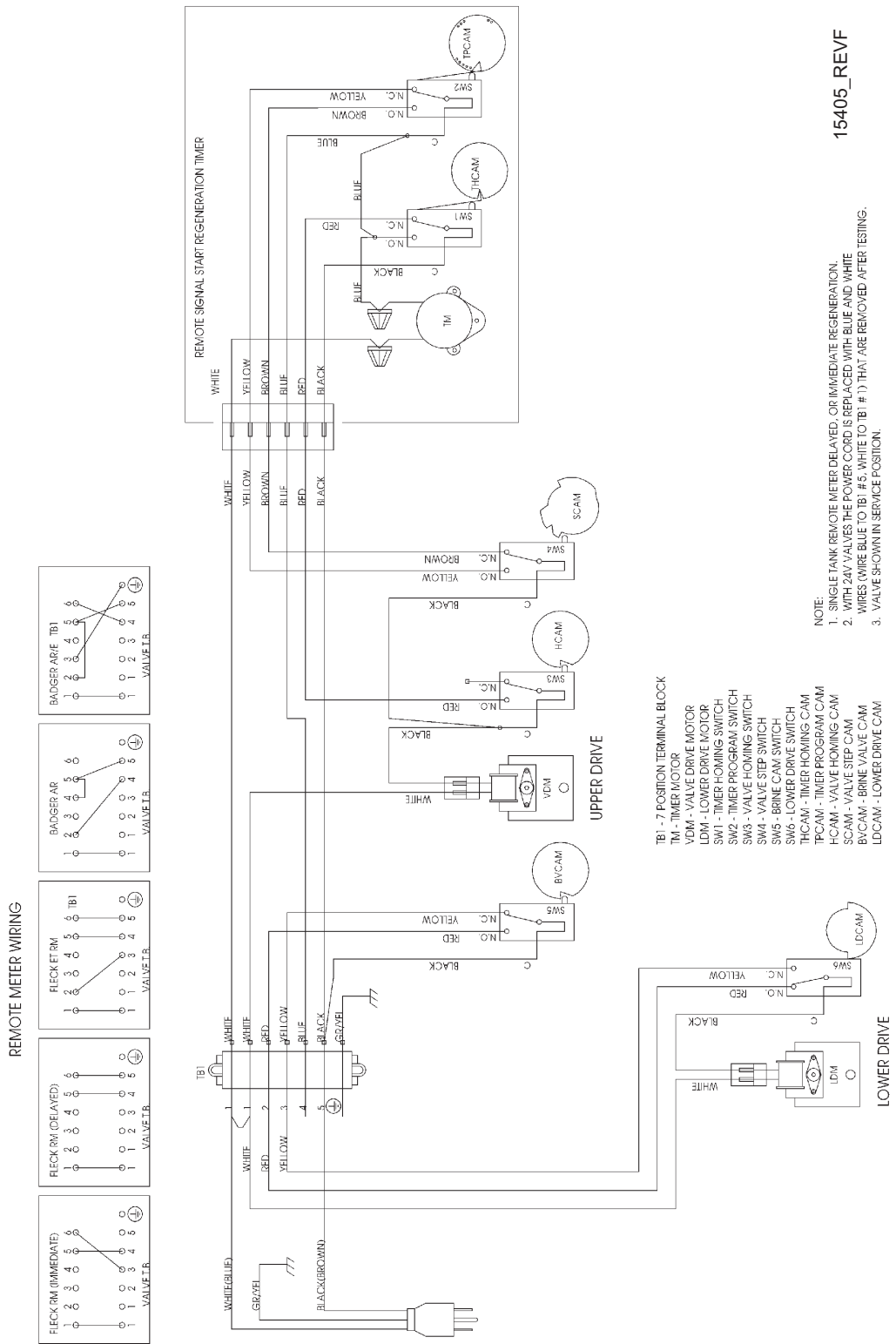
# Wiring Diagrams

## System #4 - Single Valve Regeneration Immediate and Delayed Valve Wiring

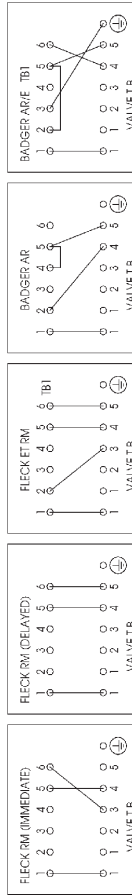


18684\_REVD

## System #4 - With Remote Signal Start Valve Wiring



### REMOTE METER WIRING



### TBI - 7 POSITION TERMINAL BLOCK

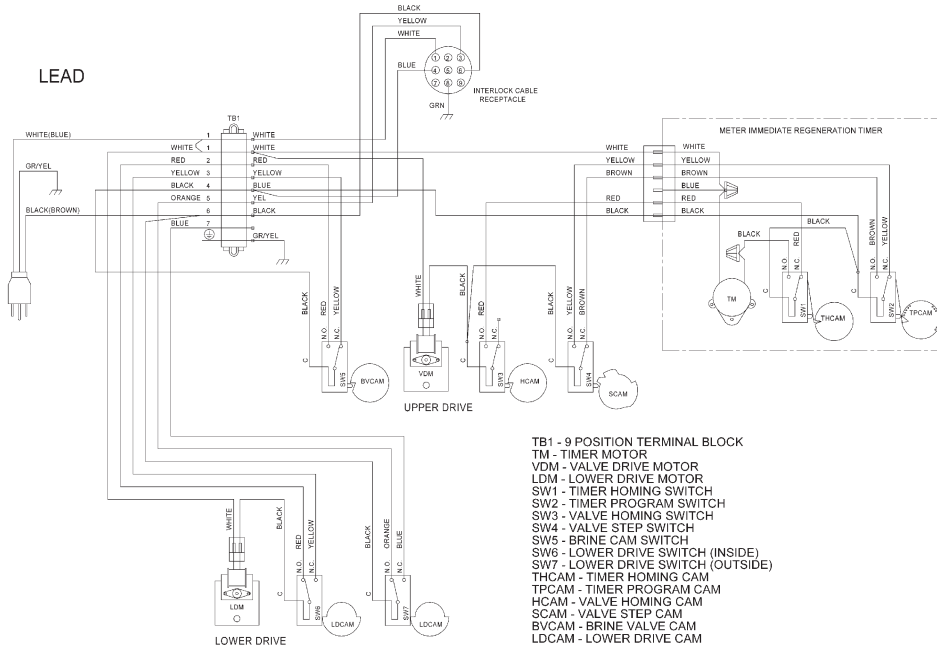
- TM - TIMER MOTOR
- VDM - VALVE DRIVE MOTOR
- LDM - LOWER DRIVE MOTOR
- SW1 - TIMER HOMING SWITCH
- SW2 - TIMER PROGRAM SWITCH
- SW3 - VALVE HOMING SWITCH
- SMA - VALVE STEP SWITCH
- SW5 - BRINE CAM SWITCH
- SW6 - LOWER DRIVE SWITCH
- TPCAM - TIMER PROGRAM CAM
- HCAM - VALVE HOMING CAM
- SCAM - VALVE STEP CAM
- BVCAM - BRINE VALVE CAM
- LDCAM - LOWER DRIVE CAM

15405\_REV F

- NOTE:
1. SINGLE TANK REMOTE METER DELAYED, OR IMMEDIATE REGENERATION.
  2. WITH 24V VALVES THE POWER CORD IS REPLACED WITH BLUE AND WHITE WIRES (WIRE BLUE TO TBI # 5, WHITE TO TBI # 1) THAT ARE REMOVED AFTER TESTING.
  3. VALVE SHOWN IN SERVICE POSITION.

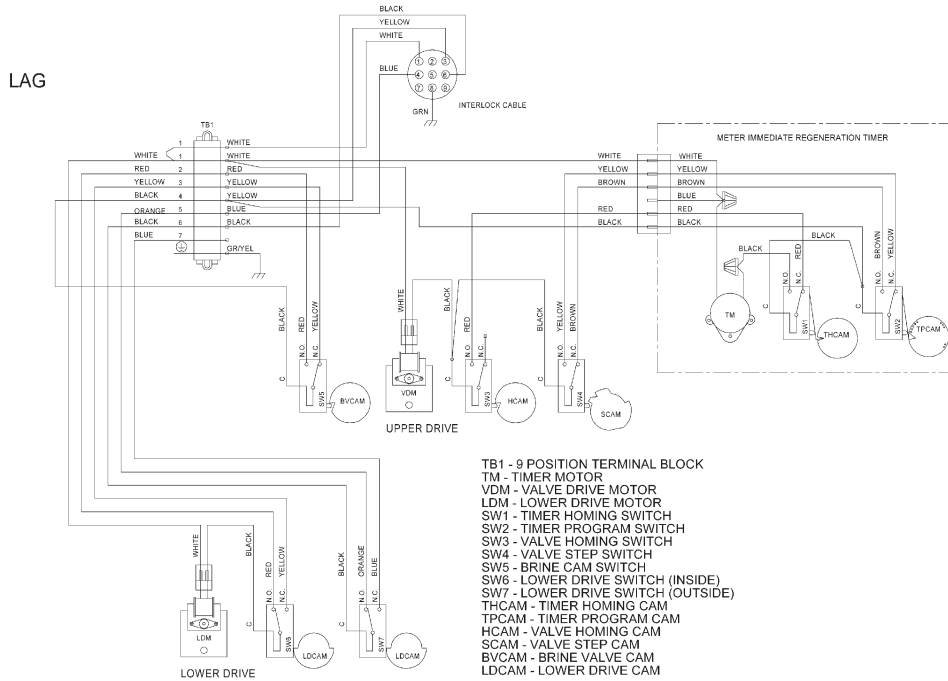
# Wiring Diagrams

## System #5 - Interlocked Regeneration Valve Wiring



**NOTE:**  
 1. TWO TANK INTERLOCKED, INDIVIDUAL METER, IMMEDIATE REGENERATION.  
 2. BOTH TANKS NORMALLY IN SERVICE. ONLY ONE TANK IN REGENERATION, THE OTHER REMAINS IN SERVICE.  
 3. VALVE SHOWN IN SERVICE.

18685-01\_REVD

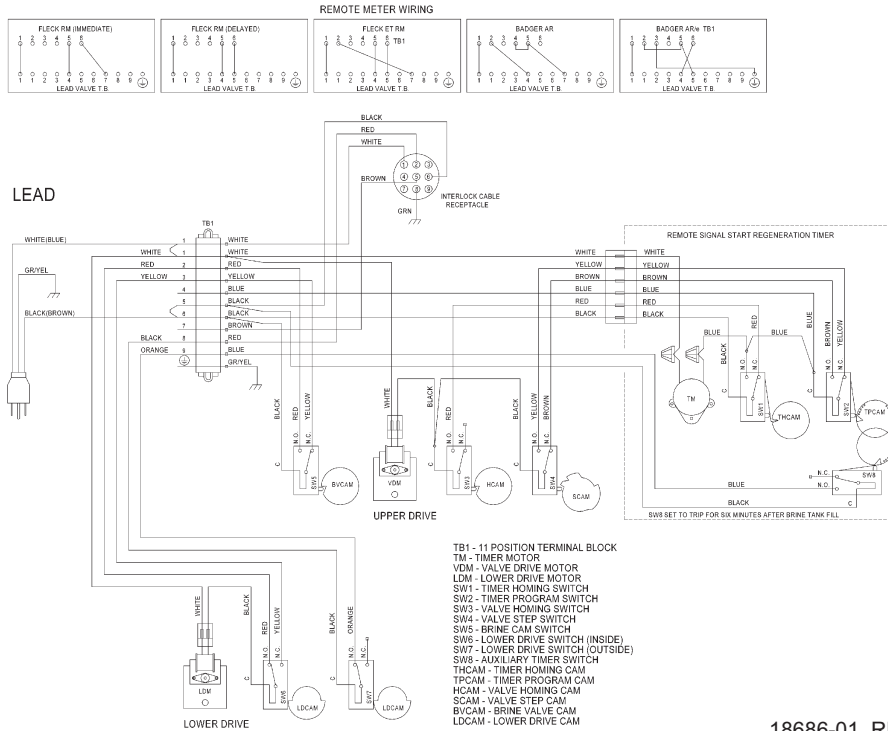


**NOTE:**  
 1. TWO TANK INTERLOCKED, INDIVIDUAL METER, IMMEDIATE REGENERATION.  
 2. BOTH TANKS NORMALLY IN SERVICE. ONLY ONE TANK IN REGENERATION, THE OTHER REMAINS IN SERVICE.  
 3. VALVE SHOWN IN SERVICE.

18685-02\_REVD

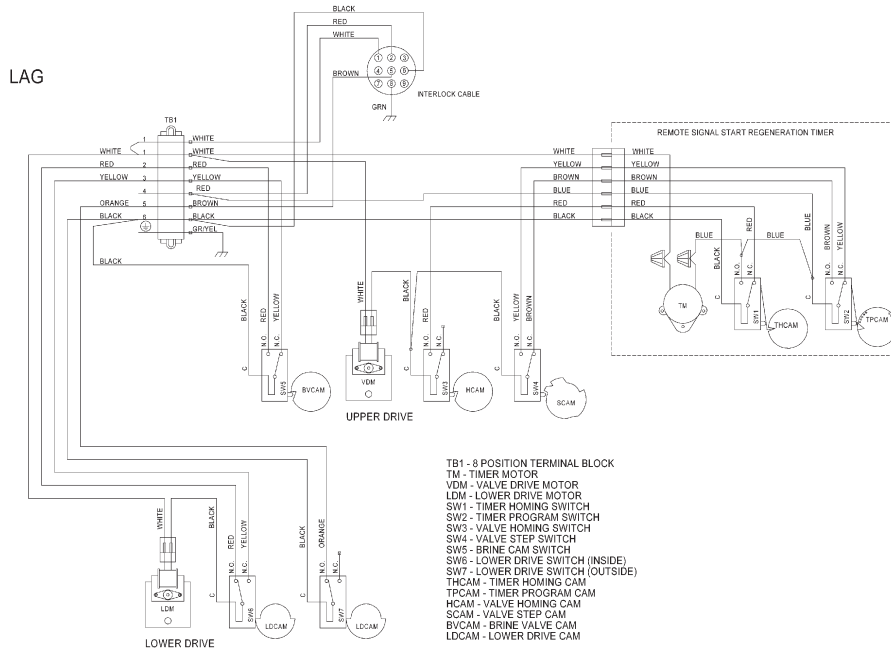


## System #6 - Series Regeneration Valve Wiring



18686-01\_REVE

- NOTE:**
1. TWO TANK INTERLOCKED, SINGLE REMOTE METER, SERIES REGENERATION.
  2. BOTH TANKS NORMALLY IN SERVICE.
  3. ONLY ONE TANK IN REGENERATION, THE OTHER REMAINS IN SERVICE.
  4. LEAD VALVE REGENERATES FIRST, FOLLOWED IMMEDIATELY BY LAG VALVE.
  5. VALVE SHOWN IN SERVICE POSITION.

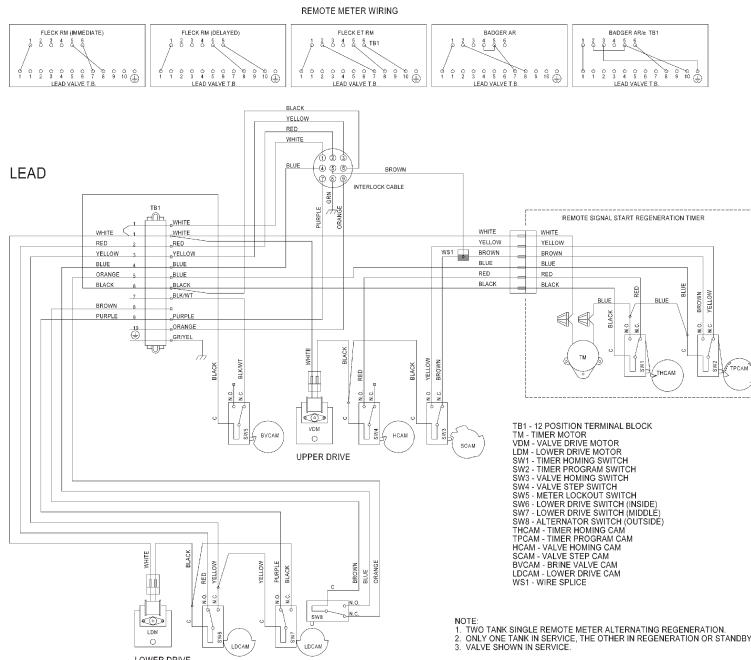


18686-02\_REVE

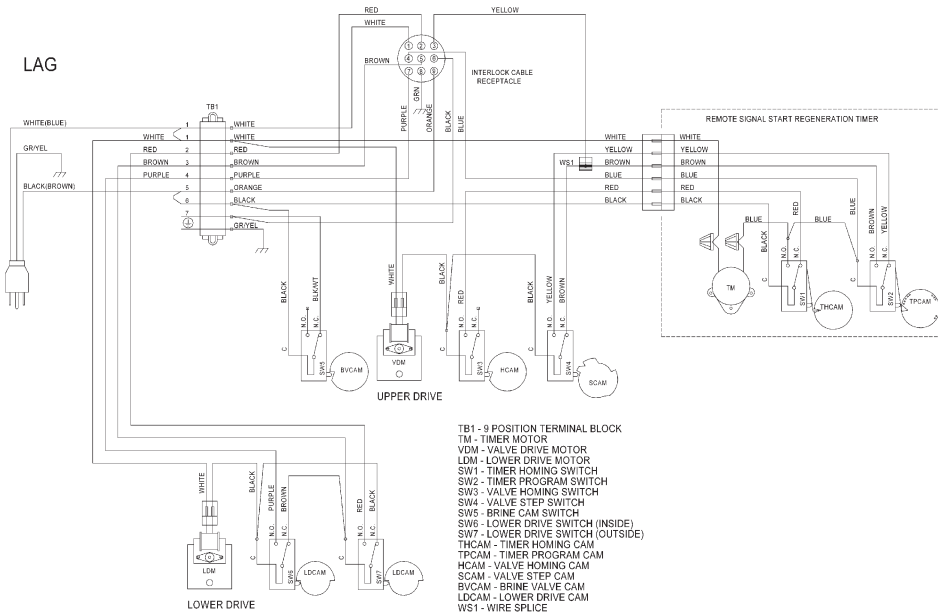
- NOTE:**
1. TWO TANK INTERLOCKED, SINGLE REMOTE METER, SERIES REGENERATION.
  2. BOTH TANKS NORMALLY IN SERVICE.
  3. ONLY ONE TANK IN REGENERATION, THE OTHER REMAINS IN SERVICE.
  4. LEAD VALVE REGENERATES FIRST, FOLLOWED IMMEDIATELY BY LAG VALVE.
  5. VALVE SHOWN IN SERVICE POSITION.

# Wiring Diagrams

## System #7 - Alternating Regeneration Valve Wiring

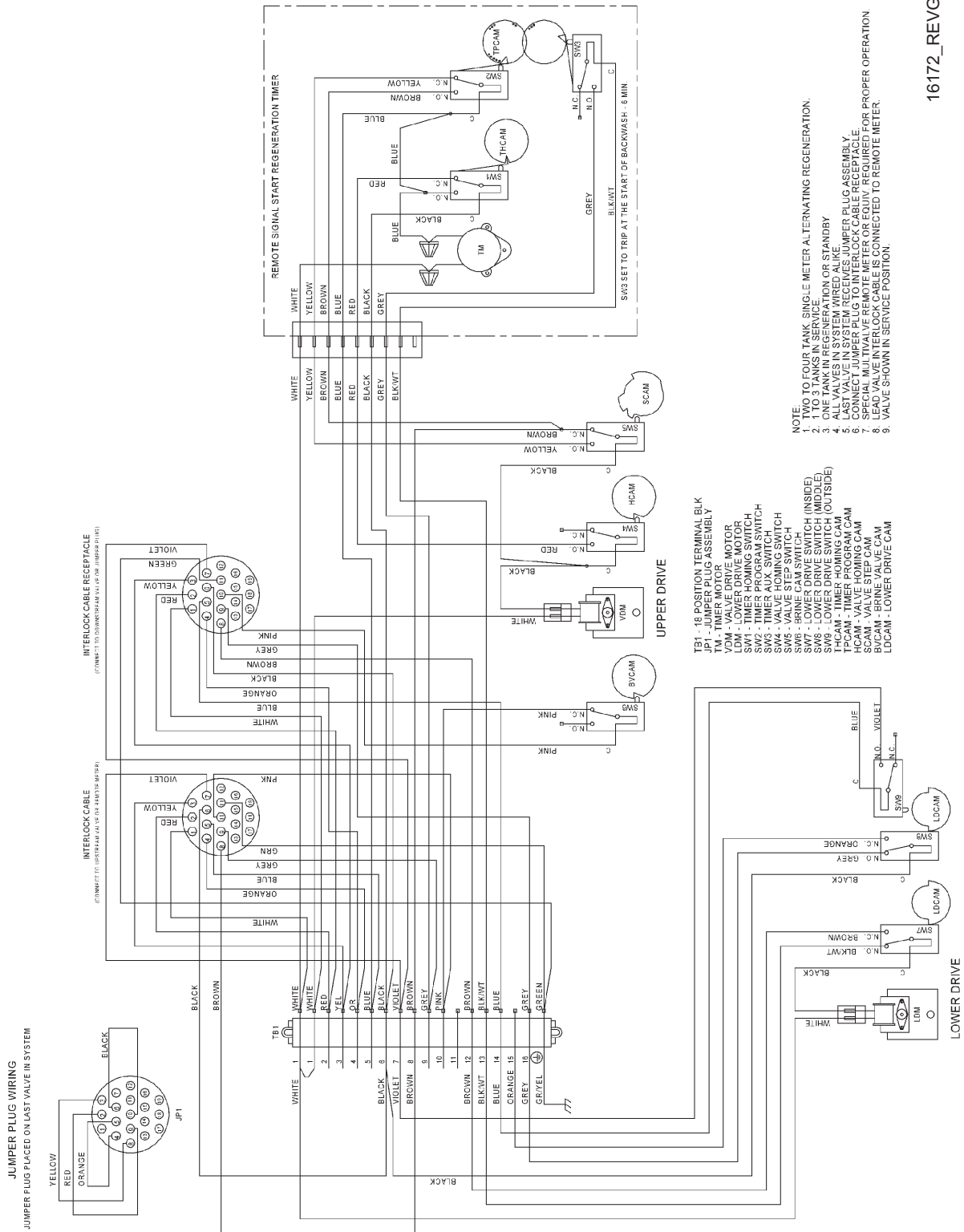


18687-01\_REVE



18687-02\_REVE

## System #7 - Alternating Regeneration Valve Wiring



16172\_REVG

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# 1600/1700 System Nozzle & Throat Chart

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## 1600 Brine System

### Standard

Size .....	Color.....	Nozzle	Throat
#0.....	Red.....	10913-0	10914-0
#1.....	White.....	10913-1	10914-1
#2.....	Blue.....	10913-2	10914-2
#3.....	Yellow.....	10913-3	10914-3
#4.....	Green.....	10913-4	10914-4

### PVC

Size .....	Color.....	Nozzle	Throat
#0.....	Gray.....	12973-0	12974-0
#1.....	Gray.....	12973-1	12974-1
#2.....	Gray.....	12973-2	12974-2
#3.....	Gray.....	12973-3	12974-3
#4.....	Gray.....	12973-4	12974-4

### Stainless Steel

Size .....	Color.....	Nozzle	Throat
#0.....	Silver.....	10225-0	10226-0
#1.....	Silver.....	10225-1	10226-1
#2.....	Silver.....	10225-2	10226-2
#3.....	Silver.....	10225-3	10226-3
#4.....	Silver.....	10225-4	10226-4

## 1700 Brine System

### Standard

Size .....	Color.....	Nozzle	Throat
#3.....	Yellow.....	14801-03C	14802-03C
#4.....	Green.....	14801-04C	14802-04C
#5.....	White.....	14801-05C	14802-05C
#6.....	Red.....	14801-06C	14802-06C

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# Service Assemblies

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**Adapters:**

61525..... Softwater Adapter Kit, 2900s  
61415..... Adapter Assy, Sidemount 2850/2900/2930  
61415NP..... Adapter Assy, Sidemount, NP 2850/2900/2930  
61415-20..... Adapter Assy, Sidemount, BSP/MTC 2850/2900/2930  
61415-20NP..... Adapter Assy, Sidemount, BSP/NP 2850/2900/2930

**Air Checks:**

60002-34..... Air Check, #500, 34" Long  
60003-34..... Air Check, #500, HW, 34" Tube  
60009-01..... Air Check, #900, Commercial, HW Less Fittings

**Auxiliary Micro Switch:**

60320-02..... Switch Kit, 3200/9000 Timer Auxiliary  
60320-11..... Switch Assy, 2900, Lower Drive (For Adding 2nd Switch)  
60320-08..... Switch Assy, 2900, Lower Drive Aux (For Adding Third Switch)

**Brine Line Flow Controls (BLFC):**

60020-25..... BLFC, .25 GPM, 1600  
60020-50..... BLFC, .50 GPM, 1600  
60020-100..... BLFC, 1.0 GPM, 1600  
60011-090..... Brine Valve, 1650, Short Stem  
60010-25..... BLFC, 1650, .25 GPM, Plastic  
60010-50..... BLFC, 1650, .50 GPM, Plastic  
60010-100..... BLFC, 1650, 1.0 GPM, Plastic

**Brine Valves:**

60011..... Brine Valve, 1650, Less BLFC  
60029..... Brine Valve, 1600, Short Stem Brass, Std O-rings  
60029HW..... Brine Valve, 1600, Short Stem Hot Water  
60034-XX..... Model 1700 brine valve Assy (specify flow control 1.0 - 5.0 )  
60604-XX..... Model 1710 brine valve Assy (specify flow control 1.0 - 5.0 )

**Covers:**

60217-02..... Environmental Lower Cover, Black  
60219-02..... Environmental, Cover, Black  
60232-XX..... Designer 2 Piece  
60232-110..... Cover, Designer, 1 Piece Black  
14800-02..... Cover, Dust, Lower, 2900, Black

**Drain Line Flow Controls (DLFC):**

60366-XX..... 1" FNPT x 3/4" FNPT (specify flow control .6 - 7.0)  
60701-XX..... 1" FNPT x 1" FNPT (specify flow control 8.0 - 25.0)  
60702-XX..... 1" FNPT x 1" MNPT (specify flow control 8.0 - 25.0)  
60708-XX..... 1" FNPT x 3/4" FNPT (specify flow control 8.0 - 25.0)  
60721-XX..... 1" FNPT x 1" FNPT (specify flow control .6 - 7.0)

**Cam Assemblies:**

60160-00..... Drive Cam Assy, RR, White  
60160-20..... Drive Cam Assy, Std  
60160-22..... Drive Cam Assy, Link, Environmental 2900 Lower Drive  
60160-30\*..... Drive Cam Assy, Upflow  
60160-31\*..... Drive Cam Assy, Upflow, Variable

**24-Hour Gear Assemblies:**

19205..... Gear Assy, 24 Hour, Silver, 5600, 12 A.M.  
60519-02..... Gear Assy, 3200 24 Hour 2 Times/Day, w/Silver Label  
60519-03..... Gear Assy, 3200, 24 Hour 3 Times/Day, w/Silver Label  
60519-04..... Gear Assy, 3200, 24 Hour 4 Times/Day, w/Silver Label  
60519-06..... Gear Assy, 3200, 24 Hour (12:00) 6 Times/Day, w/Silver Label

**Injector Assemblies (Complete):**

60480-XX..... 1600/1650 - 3/8" brine (specify size of injector)

**Meters:**

60393..... Meter Assy, 2900, 2" Std  
60394..... Meter Assy, 2900, 2" Ext  
60616..... Meter Assy, Elec 2"  
60620..... Meter Assy, 2" Plastic, Std  
60621..... Meter Assy, 2" Plastic, Ext  
60625..... Meter Assy, 2" Plastic Electronic  
61439..... Meter Sleeve w/O-ring, Machd

**Piston Assemblies:**

60103..... Piston Assy, 2900/2930, HWBP Lower  
60103-01..... Piston Assy, 2900/2930, HWBP, HW, Lower  
60104..... Piston Assy, 2900/2930, NHWBP Lwr, 2900s, Soft Wtr Rgn  
60104-01..... Piston Assy, 2900/2930, NHWBP, HW Lwr, 2900s Soft Wtr Rgn  
61540..... Piston Assy, 2900s, Downflow Upper  
61540-01..... Piston Assy, 2900s Downflow Upper, HW  
61545\*..... Piston Assy, 2900s, Upflow Upper  
61545-01\*..... Piston Assy, 2900s, Upflow Upper, HW  
61550..... Piston Assy, 2900s, HWBP Lower  
61550-03..... Piston Assy, 2900s, HWBP Lower, HW  
61555..... Piston Assy, 2900s, NHWBP Lower  
61555-03..... Piston Assy, 2900s, NHWBP Lower, HW

**Program Wheel Assemblies:**

60405-20..... Program Wheel, w/3/4" Ext Label 1 1/2" Std Set @ 100  
60405-50..... Program Wheel, w/2" Std Label Set @ 21  
60405-60..... Program Wheel, w/2" Ext Label  
60405-70..... Program Wheel, w/1 1/2" Ext Label

**Safety Brine Valves:**

60014..... Safety Brine Valve Assy, 2310  
60038..... Safety Brine Valve, 2350  
60028-30..... Float Assy, 2300, 30" White  
60026-30SAN.. Float Assy, 400A/2350, 30" HW  
60027-FFA..... Safety Brine Valve Body, 2300 Fitting Facing Arm  
60027-FFS..... Safety Brine Valve Body Fitting Facing Stud  
60028-30..... Float Assy, 2300, 30", Blue/White  
60068-30..... Float Assy, 2310, w/30" Rod

**Sales & Service Aids:**

40738..... Literature, 2900 Spec Sheet  
41689..... Literature, 2900s S/Manual  
40717..... Literature, Catalog Assy, PWT Residential/Commercial

**Seal & Spacer Kits:**

61530..... Seal & Spacer Kit, 2900s Upper  
61530-01..... Seal & Spacet Kit, 2900s, HW Upper  
60128..... Seal & Spacer Kit, 2900/2930 Lower  
60128-01..... Seal & Spacer Kit, 2900/2930, HW Lower

**Service Equipment:**

11098..... Stuffer Tool Assy, Complete  
12682..... Puller Tool Assy, 2900/3150  
12683..... Stuffer Tool Assy, 2900/3150  
13061..... Puller Assy, Port Ring  
16174..... Silicone, 2 oz. Tube  
60460..... Meter Checker Kit, Std  
60461..... Meter Checker Kit, Ext  
16586-8..... Silicone, Dow #7 8 Lb

**Service Valve Operator Assemblies:**

60150..... SVO Assy, 1600 O/S  
60150-01..... SVO Assy, 1600 N/S

**Skipper Wheel Assemblies:**

14860..... Skipper Wheel Assy, 7 Day  
14381..... Skipper Wheel Assy, 12 Day

\*Upflow Only

