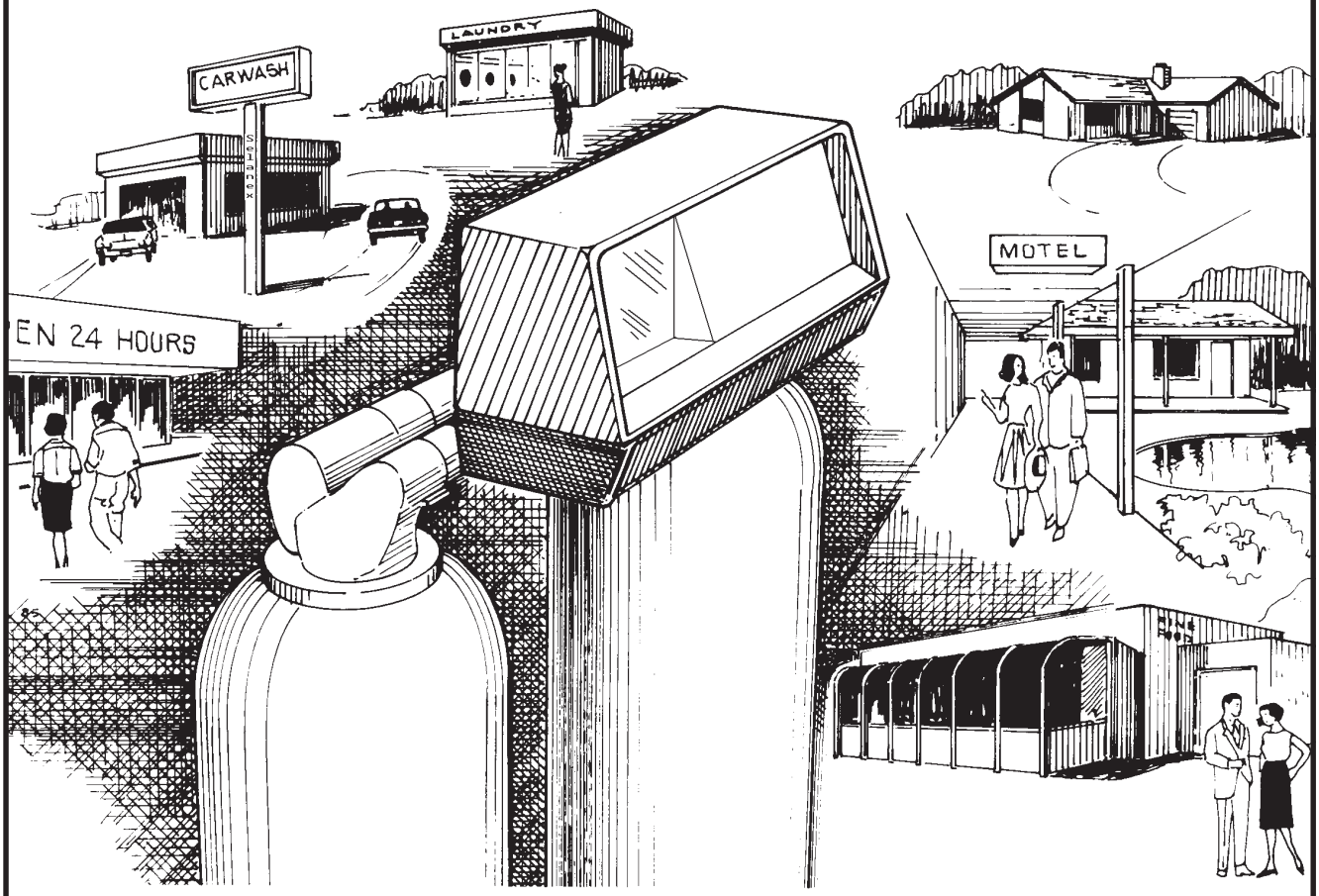
Model 9000H
Customer Manual



CM9000H-07/06

MODEL 9000H

installation information

JOB NO: . . . . . .

MODEL NO: . . . . . .

DESIGN HARDNESS: . . . . . mole/m^3 (mg/l as $CaCO_3$)

CAPACITY PER UNIT: . . . . . mole/m^3 (mg/l as $CaCO_3$)

RESIN VESSEL SIZE: . . . . . DIA. x . . . . HIGH

BRINE TANK SIZE: . . . . . DIA. x . . . . HIGH

SALT SETTING PER REGENERATION: . . . . . Kg. NaCl

RESIN VOLUME (per vessel): . . . . LITRES

9000 CONTROL VALVE SPECIFICATIONS & SETTINGS:

1) *Type of Timer: 9000-20 / 100

2) *Type of meter: 20 / 100 m^3 range

3) Meter setting . . . . . m^3

4) Regeneration programme settings:

   a) Backwash . . . . . min.

   b) Brine & Slow Rinse . . . . . min.

   c) Rapid Rinse . . . . . min.

   d) Brine tank refill: . . . . . min.

5) Drain Line Flow Control . . . . . USgpm.

6) Brine refill rate: . . . . . US gpm/lpm

7) Ejector size: . . . . . .

8) Electrical: 24 volt 50 Hz 8VA

FOR SERVICE CONTACT:

MODEL 9000H

general installation check list

WATER PRESSURE: A minimum water pressure of 1,8 bar is required for the regeneration valve to operate effectively.

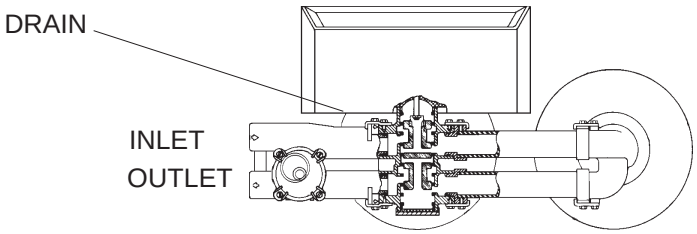
ELECTRICAL FACILITIES: A continuous 24 volt, 50 Hz. current supply is required. Make certain the current supply is always live and cannot be turned off with another switch.

EXISTING PLUMBING: Existing plumbing should be free from hardness scale and iron buildup. Piping that is built up heavily with hardness scale 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.

BYPASS VALVES: Always provide for the installation of a bypass valve system.

CAUTION: Water pressure is not to exceed 3,5 bar. Water temperature is not to exceed 70°C. The unit must not be subjected to freezing conditions.



INSTALLATION AND START-UP INSTRUCTIONS

1). Place the softener resin vessel in position, making sure the vessel is level and on a firm base.

2). All plumbing should be in accordance with local water bylaws. The minimum pipe size for the drain line should not be less than 22mm (3/4") N.B.

3). The distributor tube should be cut FLUSH with the top of the vessel. *Note: Top of vessel includes any vessel adaptor if used.*

4). Lubricate the distributor O-Ring seal and vessel O-Ring seal with silicone lubricant (Dow Corning 7® compound).

5). Fit the control valve & second tank adaptor on the resin vessels.

6). Make sure that the floor beneath the salt storage tank is both clean and level.

7). Place water in the salt tank to a depth of approximately 25mm. Salt may be placed in the tank at this time. (Use only granular or pellet/tablet type salt if a combined saturator/measuring tank system is installed).

8). Place the installation in the bypass position. Turn on the main water supply. Open a cold soft water outlet nearby and let it run for a few minutes or until such time as the pipework system is flushed free from foreign material that may have resulted from the installation.

9). Place the installation in the service position and let the water flow slowly into the resin vessel(s). Air should be expelled via the open soft water outlet and this should be closed when the water runs free of air entrapment.

10). Electrical: All electrical connections must be made according to the appropriate codes. Connect the system to a suitable transformer if required. DO NOT INSERT THE METER CABLE into the meter yet.

MODEL 9000H

general installation check list

11). For the purposes of this manual, vessel #1 is fitted with the main control valve & vessel #2 has the adaptor. Looking at the right hand side of the control valve, it has indicators which tell you which position the control valve is in during regeneration and which vessel is **IN SERVICE.** *(fig.1 shows the valve in the SERVICE position and vessel #1 in SERVICE)*.

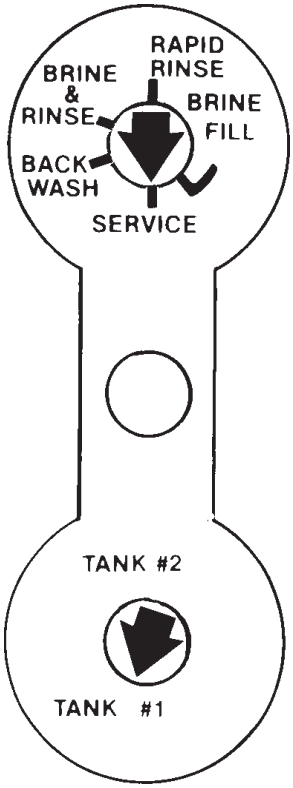


fig. 1

NOTE: Make sure that the meter cable **IS NOT** inserted into the meter dome. Swing the timer out to expose the programme wheel (fig.3) by grasping the lower right corner of the timer panel and pulling forward.

12). Cycle the timer into the backwash position by turning the manual knob (fig.2) so that the microswitch is riding on the 1st set of pins (fig.2). In this position the vessels will switch (lower piston operates) and the control valve will move to the backwash position (upper piston operates). You must wait until the positioning of the two pistons has stopped before advancing the timer further. If advanced too fast the control will not home into the service position (it will not advance to any other position). To correct this, rotate the manual knob back to service and start again into backwash. NOTE: once the control has positioned itself into the backwash cycle, the homing circuit is locked in.

With all the air backwashed out, slowly cycle the timer to the brine position; rapid rinse and brine tank refill positions. **NOTE:** You must wait for the control drive motor to position itself in each cycle and stop before advancing to the next function.

Once back in the service position, cycle the timer once again into the backwash position as described above. The vessels will be switch again (via operation of the lower piston) and air will be backwashed out of the second vessel. Cycle the timer back to the service position. Leave the timer panel open at this time.

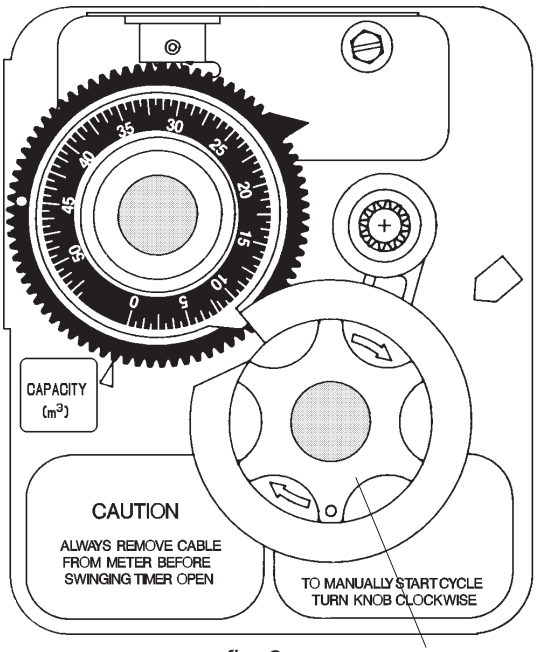


fig. 2

MANUAL KNOB

PROGRAMME WHEEL

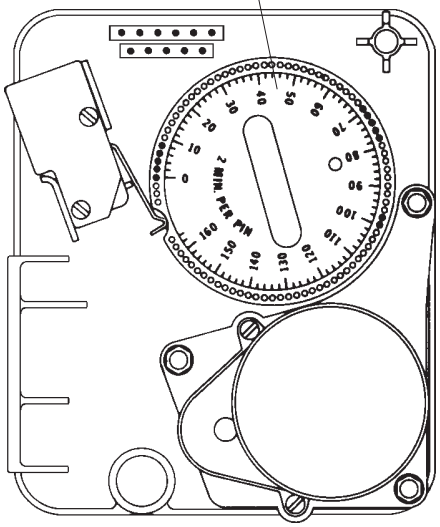
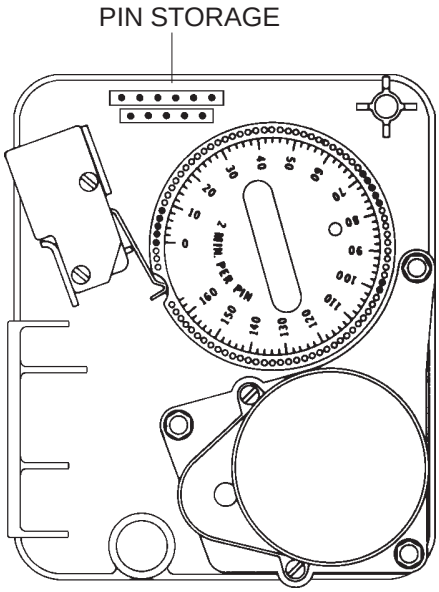


fig. 3

MODEL 9000H

regeneration cycle programme setting



How To Set The Regeneration Cycle Programme:
The regeneration cycle programme on the water softener has been set up by your installer. However, portions of the cycle or programme can be lengthened or shortened in time to suit local conditions.

To expose the cycle programme wheel, grasp the timer in the lower right hand corner and pull, releasing the snap retainer and swinging the timer to the right. **The meter cable must be disconnected from the meter dome before attempting to open the timer.**

To change the regeneration cycle programme, the programme wheel must be removed. Grasp the programme wheel and squeeze the protruding lugs towards the centre, lift the programme wheel off the timer. (Switch arms may require movement to facilitate removal).
After making any changes, return the timer to the closed position, engaging the snap retainer in the back plate. Make certain all electrical wires locate above the snap retainer post. Reconnect the meter cable if appropriate.

How to Change The Length Of The Backwash Time:
The programme wheel as shown in the drawing is in the service position. As you look at the numbered side of the programme wheel, the group of pins starting at zero determines the length of time the unit will backwash.

FOR 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 x 2 equals the backwash time in minutes.

How To Change The Length Of Brine And Rinse Time:
The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that the unit will brine and rinse. To change the length of brine and rinse time, move the rapid rinse group of pins to increase or decrease holes in the brine and rinse section. The number of holes x 2 equals the brine and rinse time in minutes.

How To Change The Length Of Rapid Rinse:
The second group of pins on the programme wheel determines the length of time that the water softener will rapid rinse. To change the length of the rapid rinse time, add or remove pins at the higher numbered end of this section as required. The number of pins x 2 equals the rapid rinse time in minutes.

How To Change The Length Of Brine Tank Refill Time:
The second group of holes on the programme wheel determines the length of time that the water softener will refill the brine tank. To change the length of refill time, move the two pins at the end of the second group of holes as required. The number of holes x 2 equals the brine tank refill time in minutes. The regeneration cycle is completed and the valve returns to the SERVICE position when the outer microswitch is tripped by the two pins set at the end of the brine tank refill section. The programme wheel will continue to rotate until the inner microswitch drops into the notch on the programme wheel.

MODEL 9000H

time brine refill & meter setting procedure

PROGRAMMING
The control valve has been factory set for backwash, brine and slow rinse, rapid rinse and brine tank fill times. See the control valve specification sheet (page 2). Any of these times can be changed by repositioning the pins and holes or by adding or removing pins (see page 5).

Example 1 - Changing the brine refill time.
The control has a separate brine tank fill cycle. The desired salt setting may be calculated as follows:

eg: If 24 kg. salt required: The unit has a 1,0 USgpm refill control (3,785 lpm) & 72 litres of refill is required (approx 0,3 kg. NaCl per litre). The timer should be set to 72 ÷ 3,785 = 20 minutes.

NOTE: There must always be 2 pins at the end of the refill time. This is to stop the fill cycle. With the regeneration times now set, place the timer back into its original position, making sure the lower right hand corner snaps back into the backplate and that the meter cable slides through the backplate and does not bind.

Example 2 - Setting the meter output wheel.
Knowing the amount of resin in each vessel and the salt setting per regeneration (see page 2), calculate the system capacity available using the following guide:

Kg NaCl/m^3 resin	Approx capacity Kg. $CaCO_3$/m^3 resin
100	48
130	55
160	64

Softened water output (m^3) = Resin capacity (kg. CaCO3/m3) x resin volume (m^3) x 1000
Water hardness (mg/l $CaCO_3$)

DO NOT SET THIS FIGURE - GO TO NEXT STEP
Since the valve regenerates with soft water from the on-line vessel, you must subtract the water used for regeneration from the above figure. Taking each of the regeneration cycles, calculate the water used for each cycle. The following example could apply to a 16 inch vessel having a 5,0 USgpm backwash control, #3 ejector, 1,0 USgpm refill control and a timer setup of:

Backwash = 6 min
Brine and Rinse = 50 min
Rapid Rinse = 6 min
Brine tank refill = 20 min

Backwash: 6 mins x 5,0 USgpm x 3,785 ÷ 1000 = 0,11 m^3

Brine & rinse: 50 mins x *.** ÷ 1000 = *.** m^3

Rapid Rinse: 6 mins x 5 USgpm x 3,785 ÷ 1000 = 0,11 m^3

Brine tank fill: 20 mins x 1,0 USgpm x 3.785 ÷ 1000 = 0,08 m^3

TOTAL REGENERATION WATER = *.** m^3

* See ejector chart slow rinse flow - page 24

MODEL 9000H

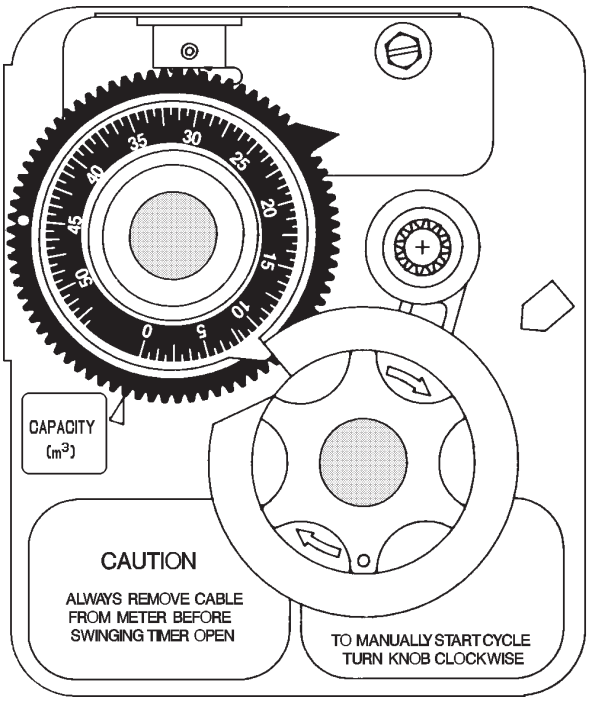
time brine refill & meter setting procedure

Having determined a nominal capacity based on resin volume, deduct the calculated total regeneration water volume. On completion of the regeneration cycle, there is an 18 minute delay from when the meter zero's out and when the next cycle starts. During this time, water continues to be available from the on line vessel so you should also deduct the volume of water that could flow during this time from the available capacity. ie: 18 mins. at maximum flow.

It is this the remaining volume figure that needs to be set on the meter dial.

To set the dial, lift the inner dial of the meter programme wheel so that you can rotate it freely. Position the white dot oposite the required meter volume setting and release the inner dial.

IMPORTANT NOTE:
If during the setting of your meter wheel, or your water usage is such that that the capacity of the service unit is exhausted before the timer is back into service, the trip arm will advance past the position shown and the "Meter Reset Stop" will stall in the 12:00 position. No regenerations will be initiated. To get the unit back to the proper position: 1st - turn the Manual Regeneration knob into Backwash and 2nd - lift the reset plate up and allow the meter programme wheel to reset itself.

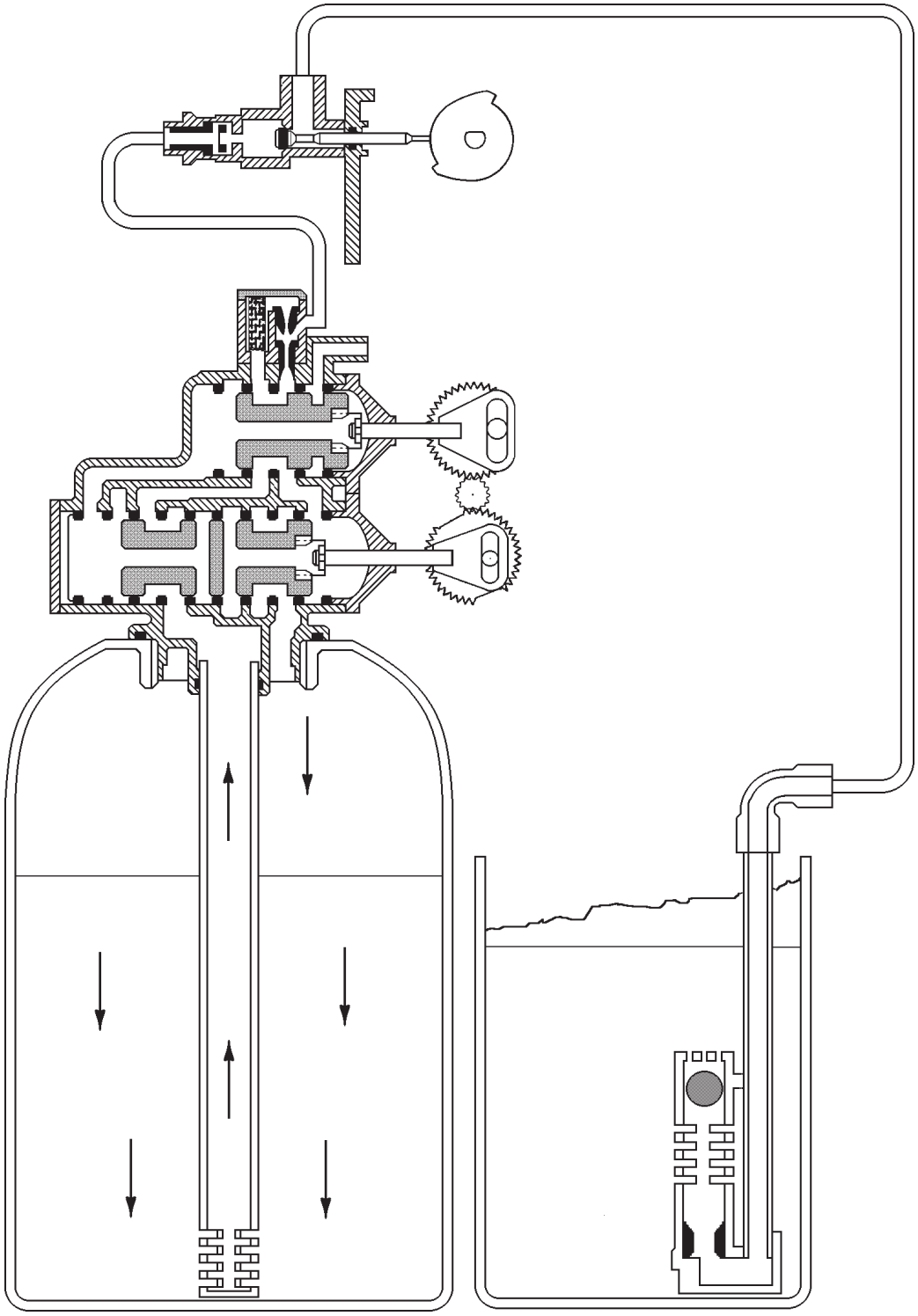


NOW

1. Insert the meter cable into the meter dome
2. Check that bypass valves are in the correct position
3. Connect the power supply.

MODEL 9000H

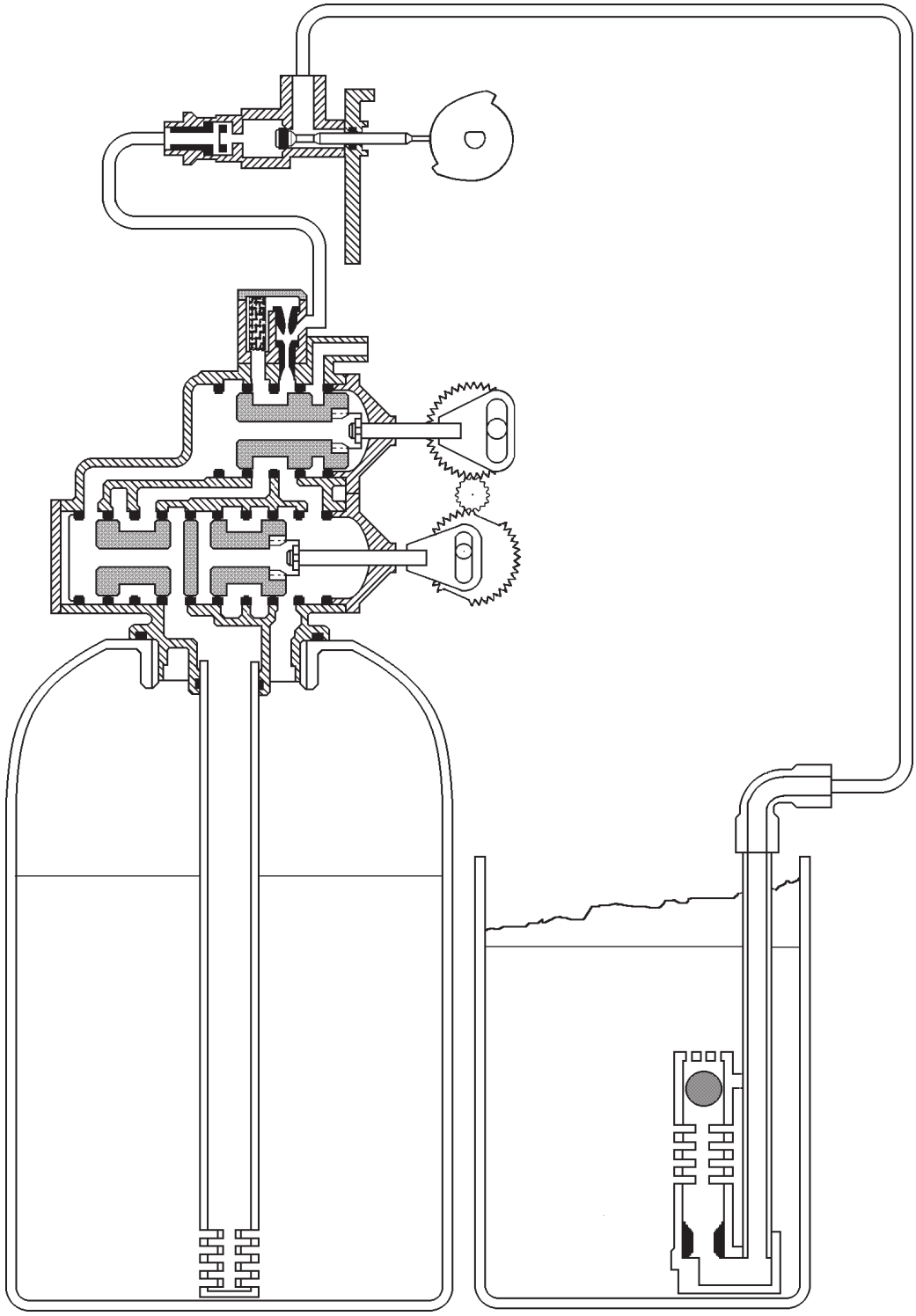
service position



Hard water enters the system at the valve inlet, flows around the lower piston & down through the resin in the first pressure vessel. Softened water exits via the bottom collector system in the resin vessel, flows around the lower piston and flows to service via the system water meter. The second resin vessel is regenerated & on standby.

MODEL 9000H

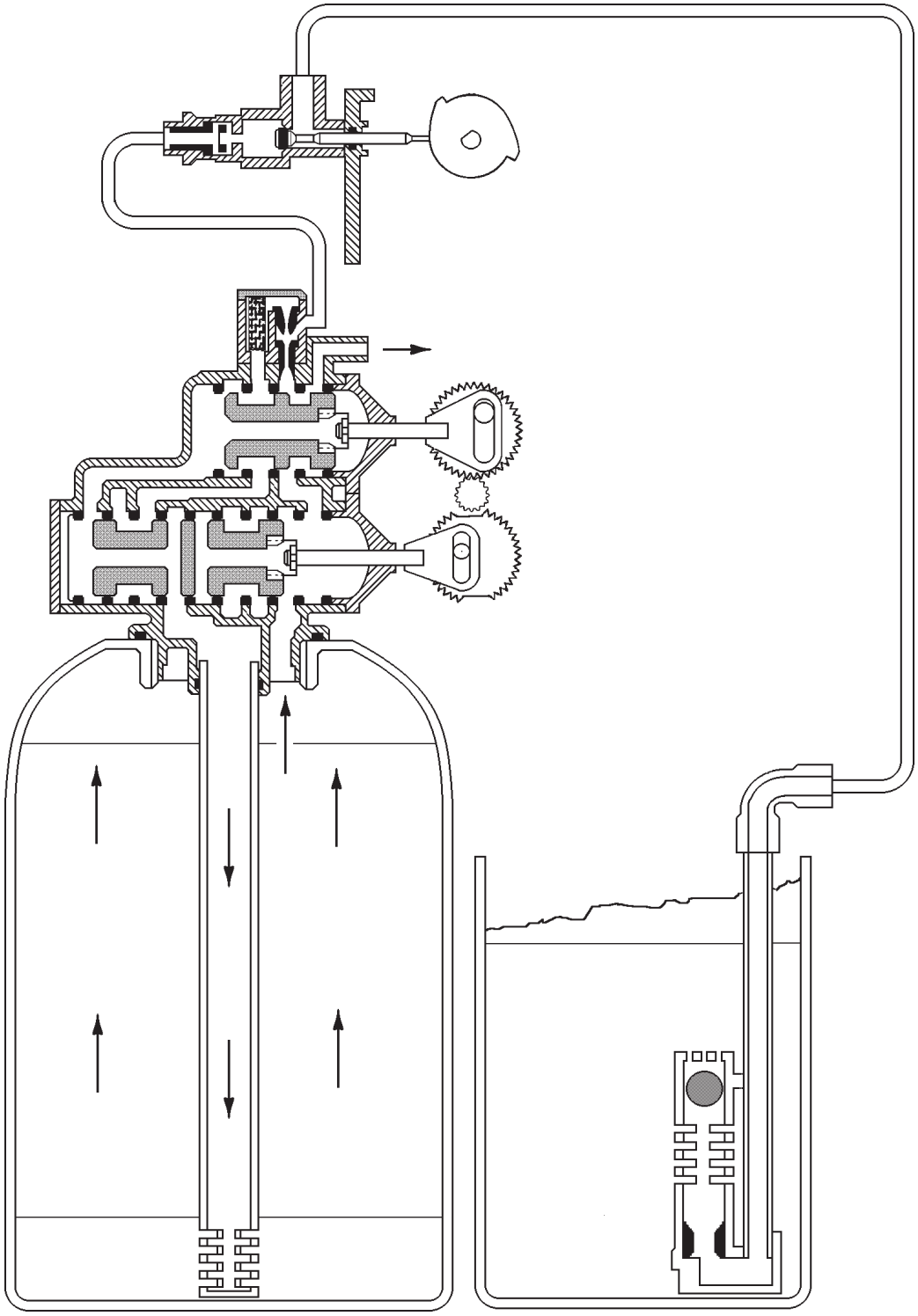
tanks switching (meter has initiated regeneration)



Hard water enters the system at the valve inlet, flows around the lower piston & through the pipe leading to the second vessel, passing through the resin in the second vessel. Softened water exits via the bottom collector system in the second vessel. It transfers via the connecting pipe to the valve, flows around the lower piston and flows to service via the water meter. The first resin vessel is out of the service flow path & is ready for regeneration.

MODEL 9000H

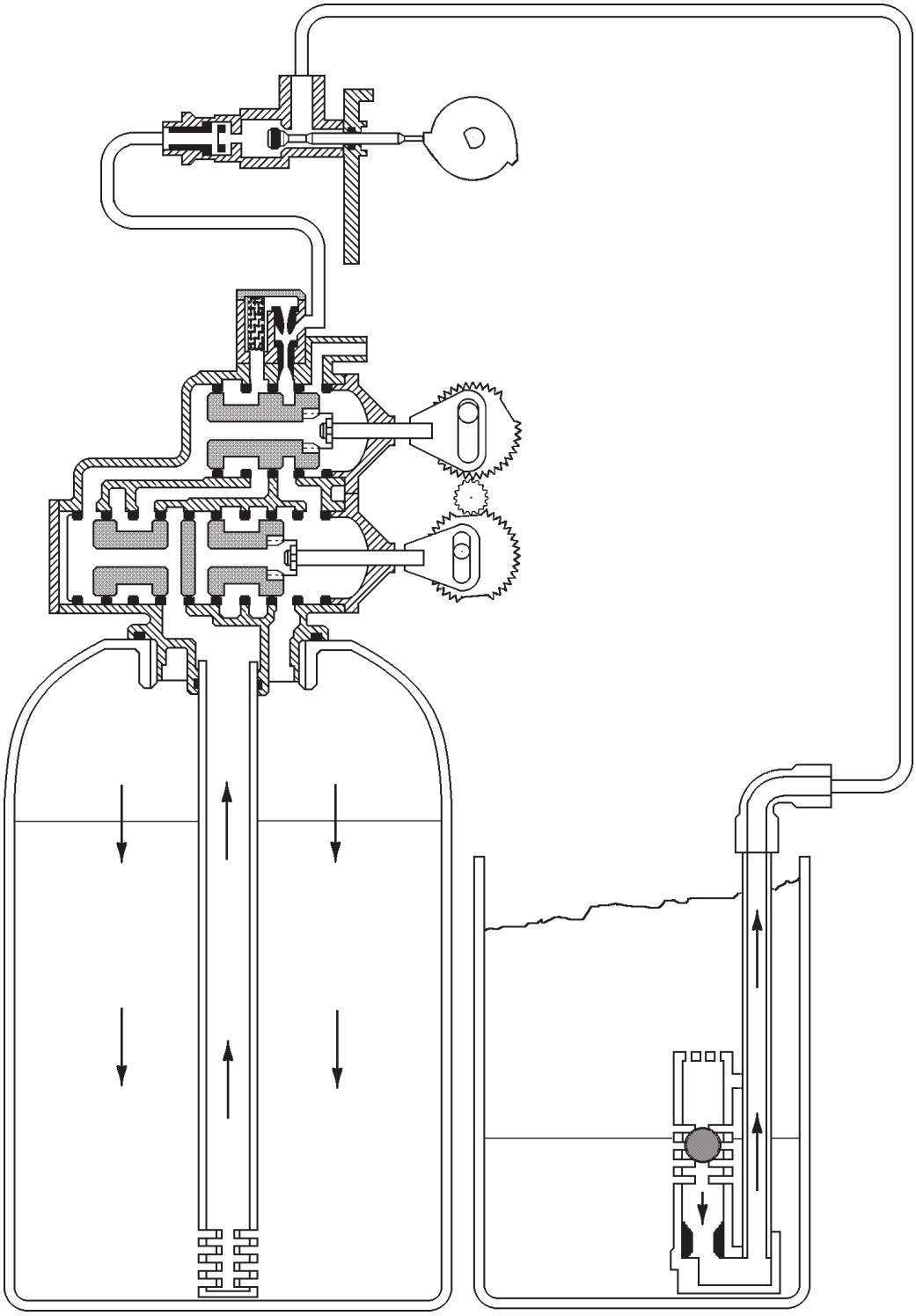
backwash position



Softened water from the second pressure vessel flows around the lower piston, around the upper piston and exits into the bottom of the first vessel via the bottom screen. The resin bed is expanded by the upflow of water, which then exits the valve via the upper piston and flows to drain.

MODEL 9000H

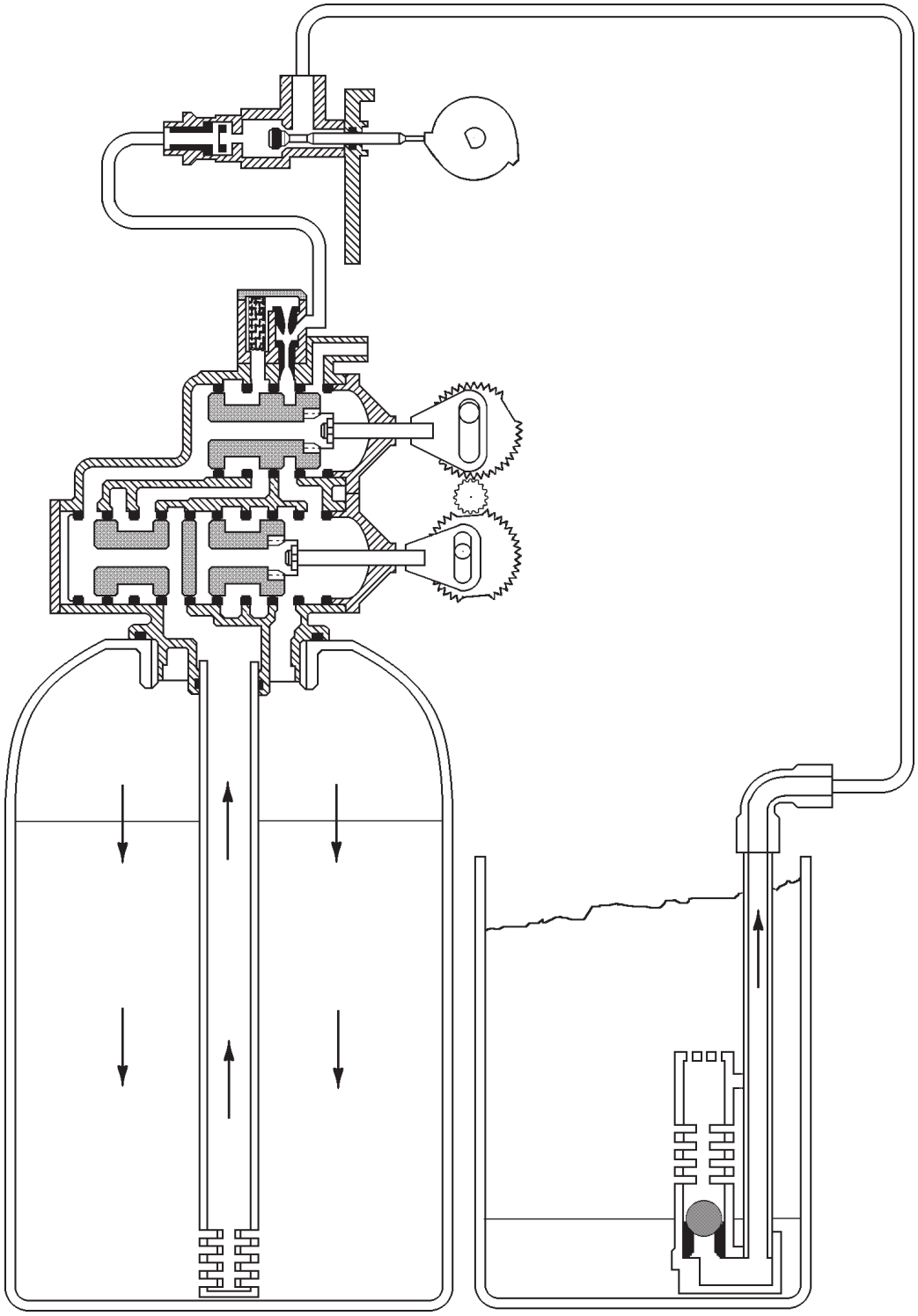
brine draw position



Softened water from the second pressure vessel flows around the lower piston, around the upper piston & into the ejector housing. As it passes through the ejector nozzle, a vacuum is generated which draws brine up from the brine tank. Brine flows around the upper piston, down through the resin bed and exits via the bottom screen. It flows up the centre tube, through the bore of the lower piston and up into the upper valve section where it exits via the bore of the upper piston to drain.

MODEL 9000H

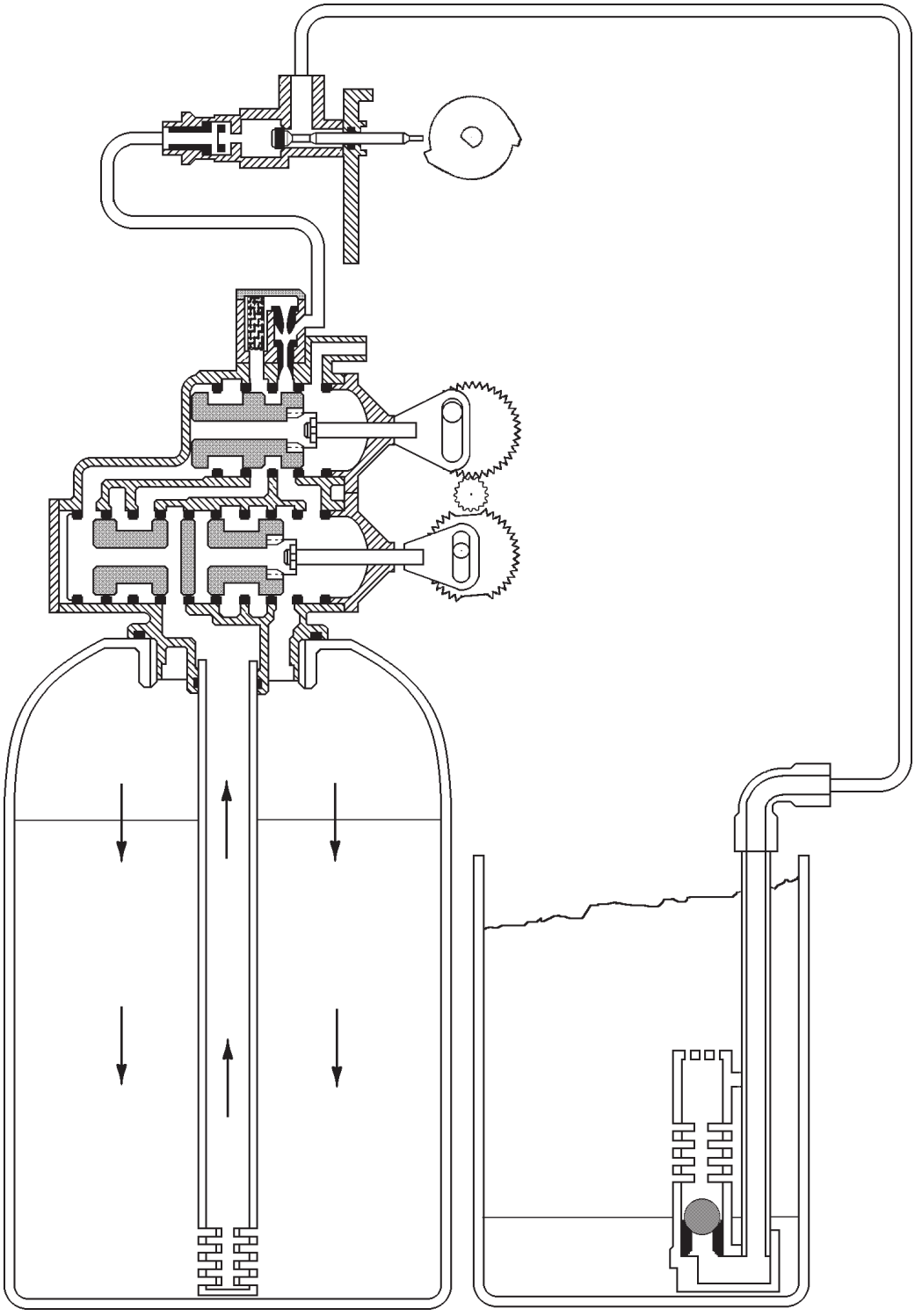
slow rinse position



Softened water from the second pressure vessel flows around the lower piston, around the upper piston & into the ejector housing. As it passes through the ejector nozzle, a vacuum is still generated but the brine air check assembly has shut off preventing further brine/air suction. The softened water flows around the upper piston, down through the resin bed and exits via the bottom screen. It flows up the centre tube, through the bore of the lower piston and up into the upper valve section where it exits via the bore of the upper piston to drain.

MODEL 9000H

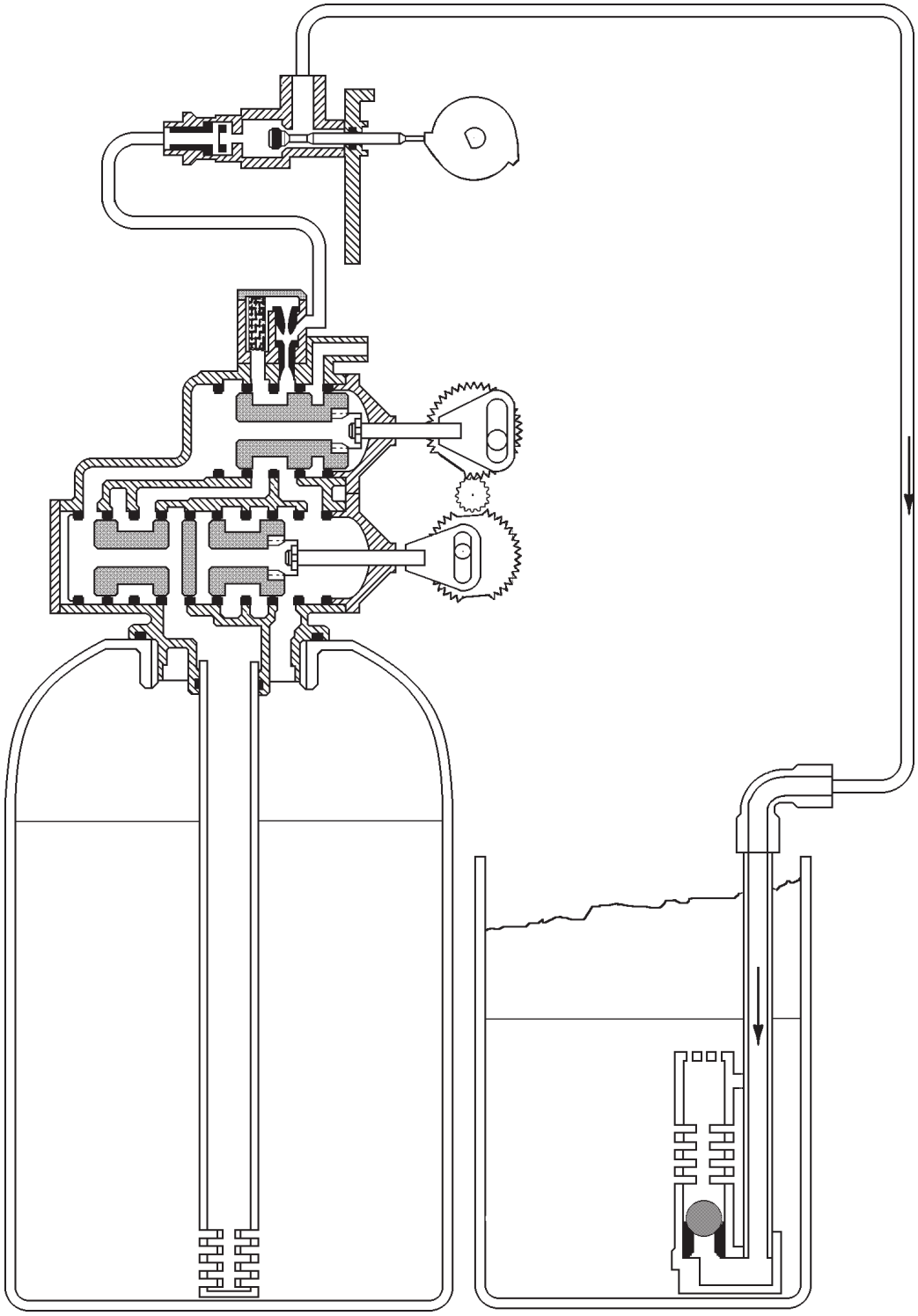
rapid rinse position



Softened water from the second pressure vessel flows around the lower piston, around the upper piston & down through the resin in the first vessel. The rinse water exits the first vessel via the bottom screen. It flows up the centre tube, through the bore of the lower piston and up into the upper valve section where it exits via the bore of the upper piston to drain.

MODEL 9000H

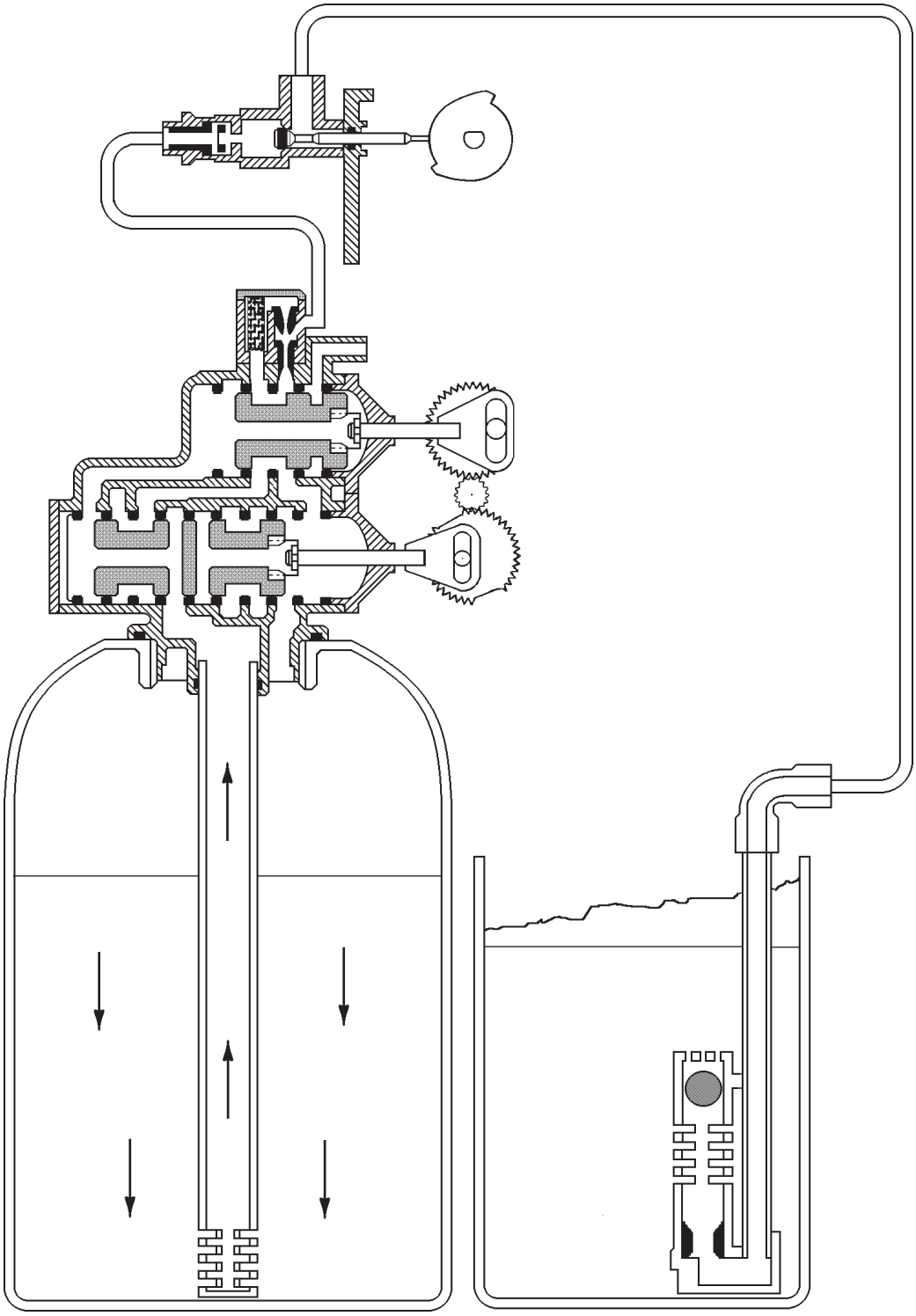
brine tank fill position



Softened water from the second pressure vessel flows around the lower piston, around the upper piston & into the ejector housing. The flow rate is regulated by a flow orifice as the softened water exits via the brine valve and into the brine tank. In additon to refilling the brine tank, the softened water also flushes the brine system and resets the air check ball. No water flows through the first vessel at this stage.

MODEL 9000H

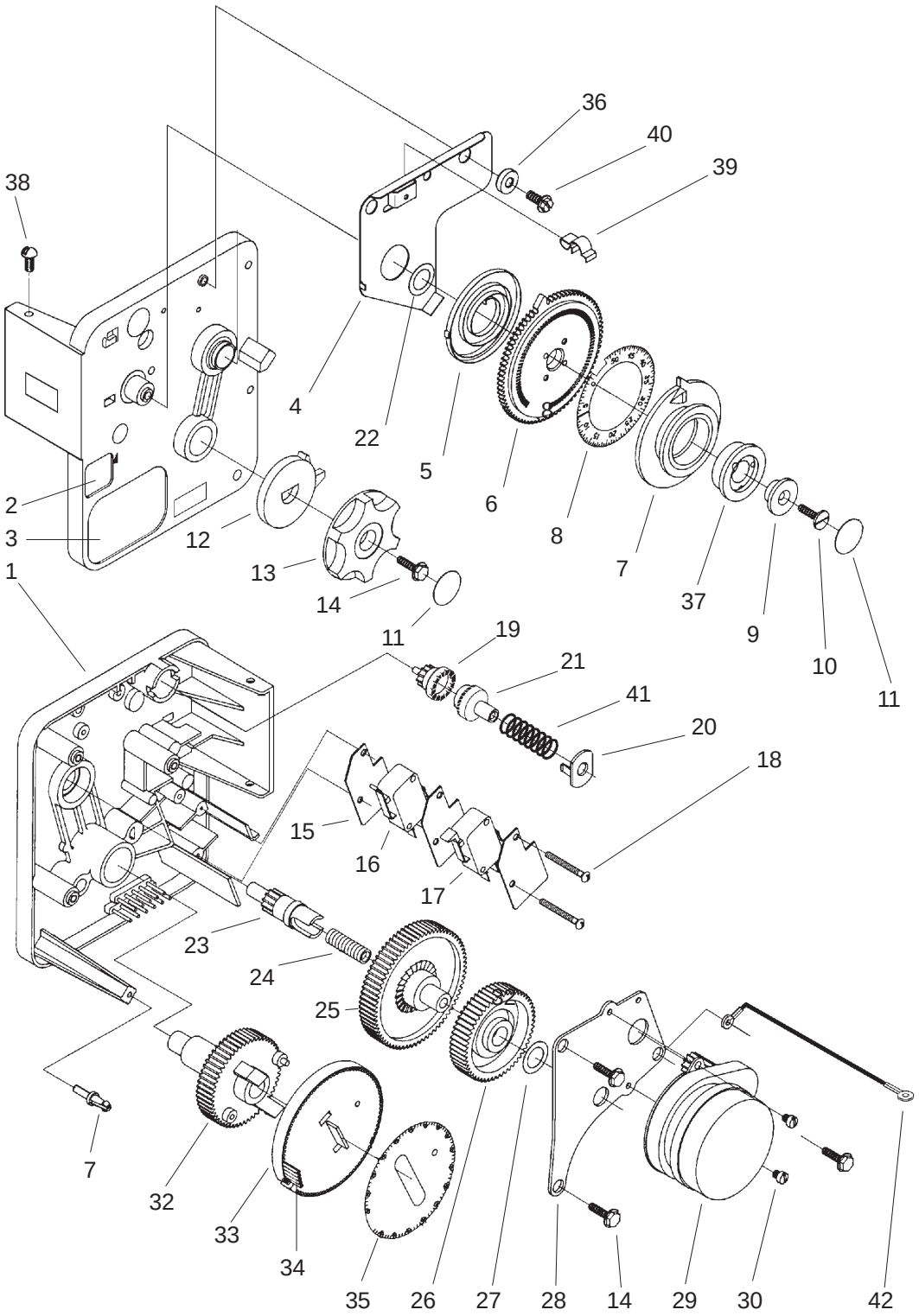
service position, tanks switched



Hard water enters the system at the valve inlet, flows around the lower piston & through the pipe connecting to the second vessel. It flows down through the resin in the second pressure vessel and exits via the bottom screen, flowing up the centre tube and back across to the main valve via the connection pipe. The softened water exits via the lower piston, through the water meter and away to service. The regenerated first pressure vessel is out of the flow path and on standby, ready for duty when the second tank becomes exhausted.

MODEL 9000H

timer assembly



MODEL 9000H

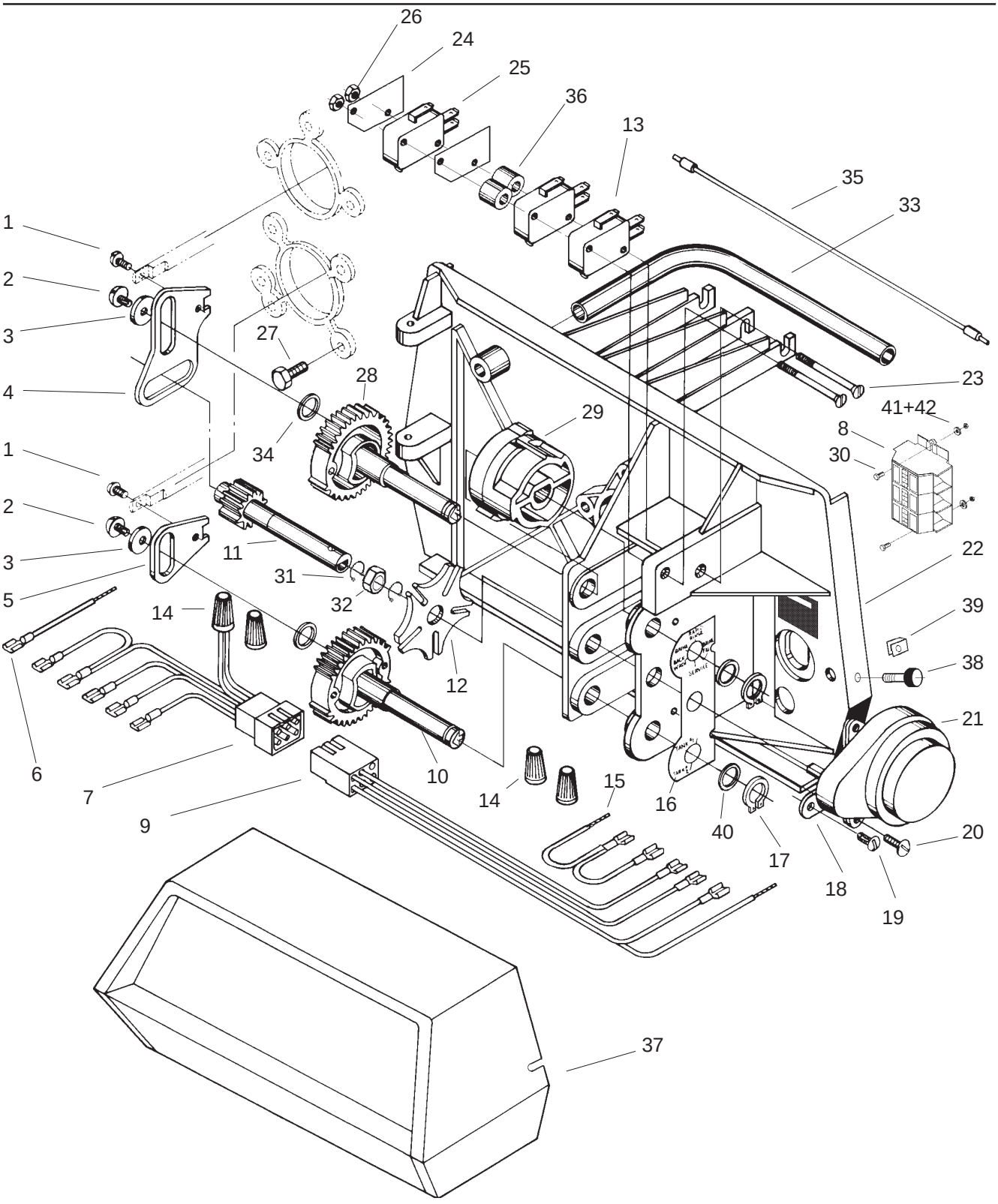
timer assembly

PARTS LIST

Item No.	Quantity	Part No.	Description
1	1	13870-02	Timer housing assy
2	1	23085	Capacity label
3	1	14045	Instruction label - English
4	1	15227	Actuator plate
5	1	15228	Spring
6	1	15224	Drive gear - Programme wheel
7	1	15956	Adjusting disc
8	1	27185	Programme wheel label 100m^3
9	1	13806	Programme wheel retainer
10	1	13748	Flat head screw
11	2	13953	Screw cover-up label
12	1	15223	Cycle actuator
13	1	13886	Knob
14	4	13296	Screw
15	3	14087	Microswitch insulator
16	1	15314	Microswitch
17	1	15320	Microswitch
18	2	11413	Rd Hd Machine screw
19	1	17724	Programme wheel drive pinion
20	1	14253	Clutch spring retainer
21	1	17723	Drive pinion clutch
22	1	15407	Washer
23	1	13018	Idler pinion
24	1	13312	Idler spring
25	1	15224	Idler gear - programme wheel
26	1	13164	Drive gear
27	1	13299	Curved washer
28	1	13887	Motor mounting plate
29	1	18826	Motor 24V/50Hz 1/30 rpm
30	3	13278	Screw
31	1	14265	Spring clip
32	1	15055	Min drive gear
33	1	13880	Programme wheel
34	21	15493	Roll pin
35	1	23717	Programme wheel decal - 180min
36	1	15233	Pivot spacer
37	1	13885	Programme wheel cover
38	2	15173	Rd Hd machine screw
39	1	17513	Retaining spring
40	1	10300	Screw
41	1	14276	Meter clutch spring
42	1	23727	Ground wire

MODEL 9000H

control drive assembly

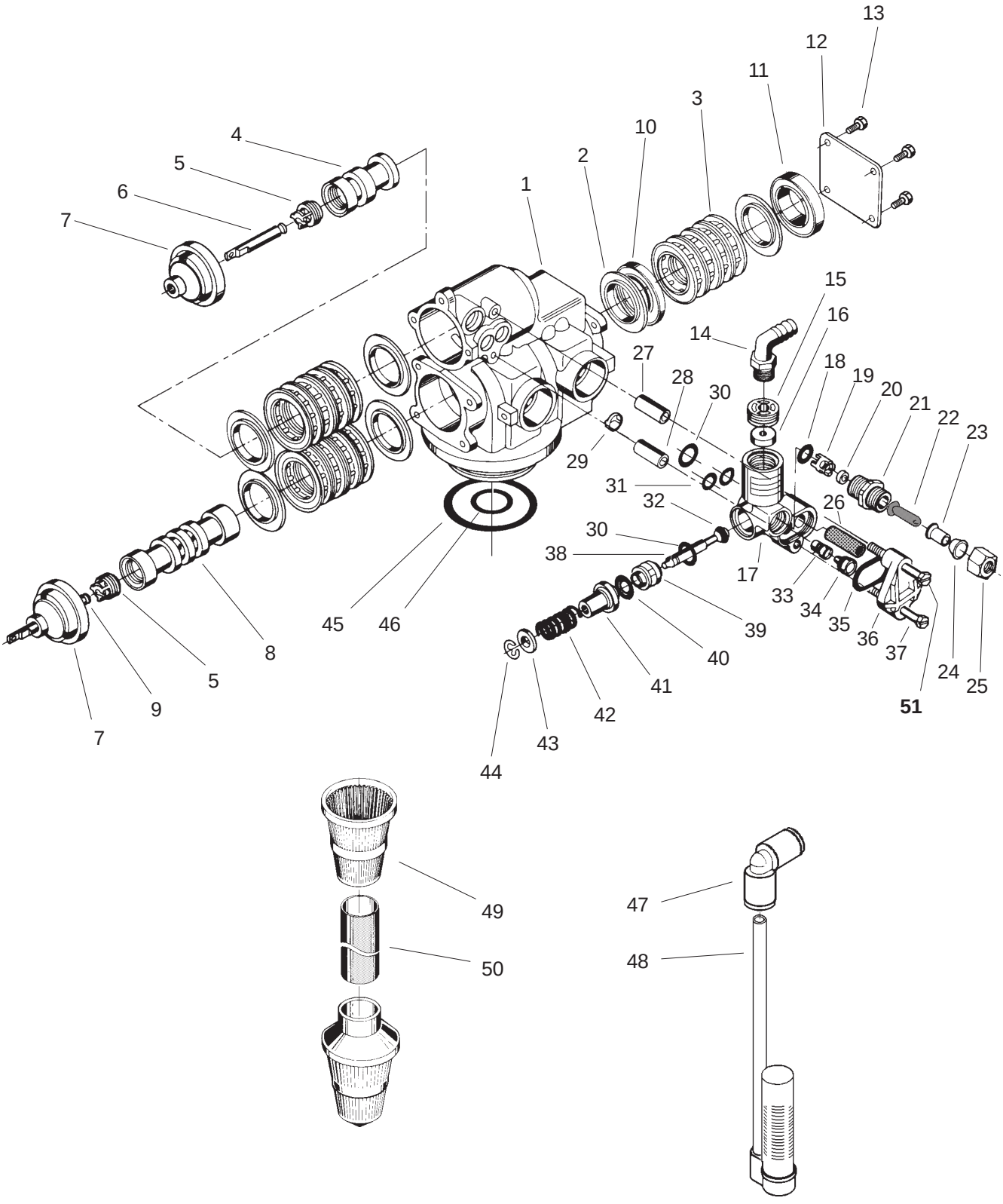


PARTS LIST

Item No.	Quantity	Part No.	Description
1	2	11335	Screw
2	2	13296	Screw
3	2	23250	Washer
4	1	14921	Piston rod link - Upper
5	1	15019	Piston rod link - Lower
6	1	15205	Wire assy
7	1	15203	Wire harness - Timer
8	1	24163	Terminal strip
9	1	15202	Wire harness - Drive
10	1	25870	Drive gear - Lower
11	1	25869	Drive gear assembly
12	1	14896	Geneva wheel
13	1	16433	Microswitch
14	2	11673	Wire connector
15	1	15204	Wire assy - Drive
16	1	24767	Shaft position label
17	2	14917	Retaining ring
18	1	15199	Ground plate
19	1	10300	Screw
20	2	13602	Screw
21	1	26503-24	Motor + adaptor 24V 50Hz
22	1	15131	Control panel
23	2	16442	Screw
24	4	10302	Microswitch insulator
25	2	10218-01	Microswitch
26	2	10339	Nut
27	7	15331	Hex head screw
28	1	25868	Drive gear assy - Upper
29	1	15132	Triple cam
30	2	11086	Screw
31	2	15810	Retaining ring
32	1	17315	Manual regen nut
33	1	15368	Cable guide
34	2	15372	Thrust washer
35	1	15216	Flexible cable assy - 387mm
36	2	16443	Spacer
37	1	18983-11	Cover assy - Black
38	2	15236	Cover mount screw
39	2	14932	Insert
40	2	15692	Washer
41	2	11663	Washer
42	2	11085	Nut

MODEL 9000H

valve body assembly



MODEL 9000H

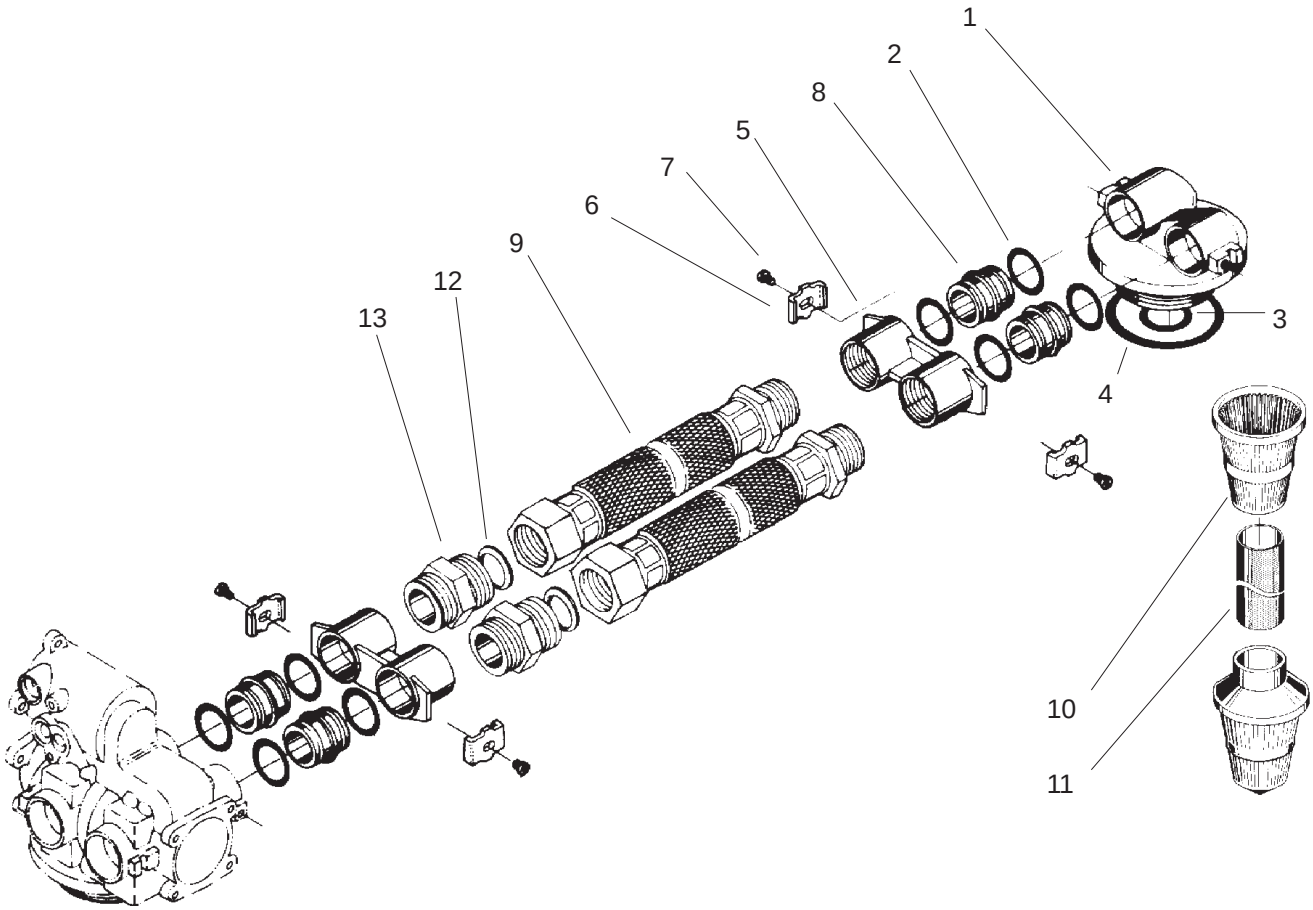
valve body assembly

PARTS LIST

Item No.	Quantity	Part No.	Description
1	1	14861-01-N	Valve body
2	16	117772	Seal
3	12	14241-01	Spacer
4	1	14914	Piston - upper
5	2	14309	Piston rod retainer
6	1	14919	Piston rod - upper
7	2	13446	End plug assy
8	1	14905	Piston - lower
9	1	14920	Piston rod - lower
10	1	16595	Spacer
11	1	14928	End plug
12	1	14906	End plate
13	4	15137	Screw - End plate
14	1	21511	Drain elbow
15	1	13173	DLFC Flow retainer
16	1	12085	Flow washer 1.2 gpm
or	1	12086	Flow washer 1.5 gpm
or	1	12090	Flow washer 3.5 gpm
17	1	15215	Injector & drain housing
18	1	12977	O-Ring
19	1	13245	BLFC button retainer
20	1	12094	Flow washer 0.25 gpm *(see page 1)*
or	1	12097	Flow washer 1.0 gpm *(see page 1)*
21	1	13244	BLFC fitting
22	1	12767	Injector screen
23	1	10332	Insert sleeve
24	1	10330	Delrin sleeve
25	1	10329-N	Fitting nut
26	1	10227	Injector screen
27	1	13361	Spacer - injector
28	1	26726-N	Spacer - injector
29	1	13497	Air disperser
30	3	13302	O-Ring
31	2	13301	O-Ring
32	1	12626-01	Shut-off valve seat
33	1	10226-?	Injector throat - specify size *(see page 1)*
34	1	10225-?	Injector nozzle - specify size *(see page 1)*
35	1	13303	O-Ring
36	1	13166	Injector cover
37	1	13315	Injector mount screw
38	1	14925	Brine valve stem
39	1	13167	Brine valve spacer
40	1	12550	Quad ring
41	1	13165	Brine valve cap
42	1	11973	Brine valve spring
43	1	16098	Washer
44	1	11981	Retaining ring
45	1	12281	O-Ring
46	1	11710	O-Ring
47	1	12794	Tube elbow
48	1	23473	Type 500A HW air check
49	1	18280-01	HiFlo top screen - HW - Bayonet
50	1	21675	1in HiFlo HW riser/screen
51	1	13315	Injector mount screw

MODEL 9000H

2nd tank adaptor / connection

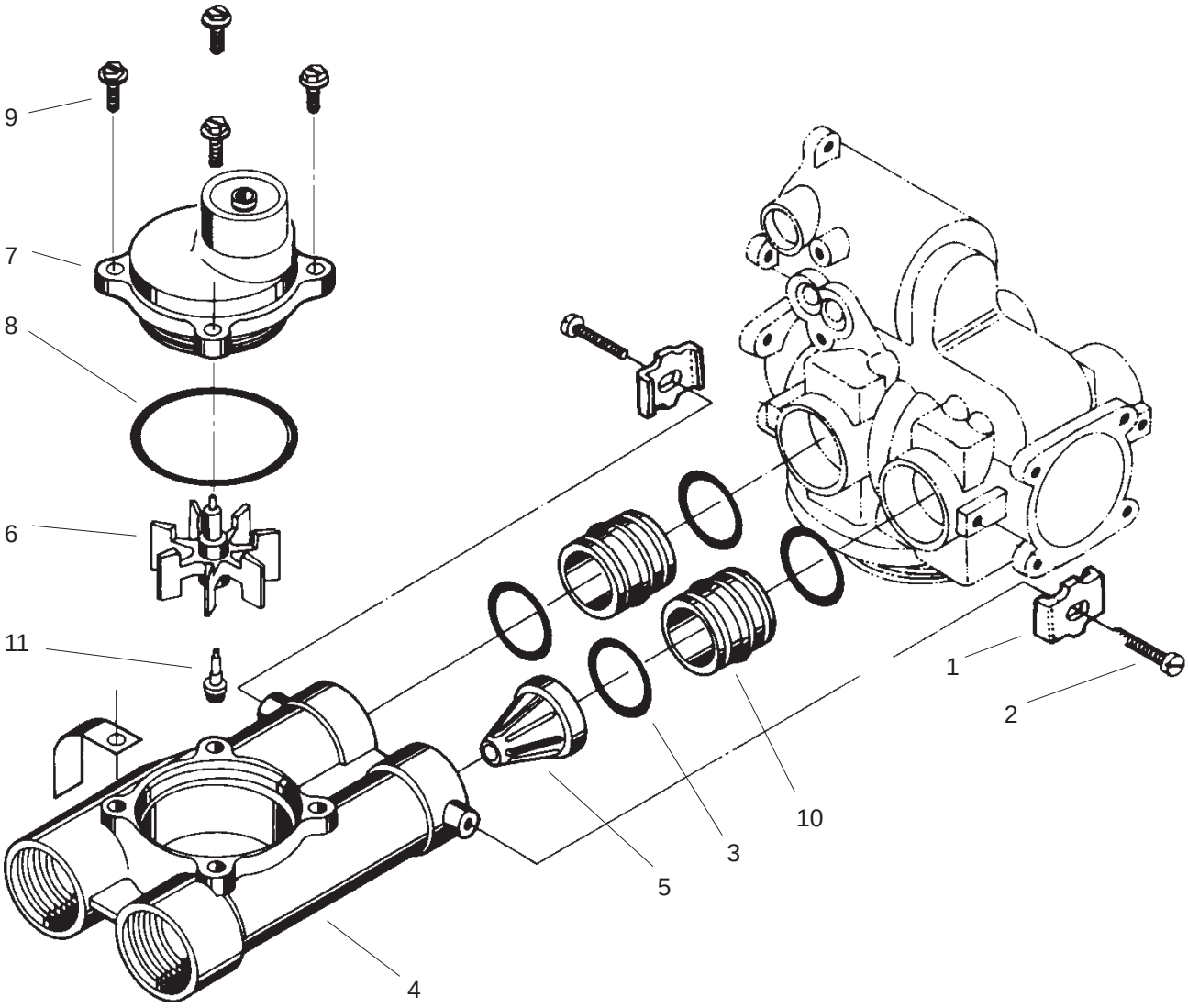


PARTS LIST

Item No.	Quantity	Part No.	Description
1	1	15530-N	Adaptor
2	8	13305	O-Ring
3	1	11710	O-Ring
4	1	12281	O-Ring
5	2	13398-N	1in Valve yoke
6	4	13255	Adaptor clip
7	4	14202	Screw
8	4	15078	Adaptor coupling
9	1	18122	Flexible hose assy - 200mm *(pair)*
or	1	18123	Flexible hose assy - 350mm *(pair)*
or	1	18124	Flexible hose assy - 500mm *(pair)*
10	1	18280-01	HiFlo top screen - HW - Bayonet
11	1	21675	1in HiFlo HW riser/screen
12	2	11206	Fitting gasket *(included in item 9 assy)*
13	2	21660	1in bushing *(included in item 9 assy)*

MODEL 9000H

1" meter assembly



PARTS LIST

Item No.	Quantity	Part No.	Description
1	2	13255	Adaptor clip
2	2	14202	Screw
3	4	13305	O-Ring 560-CD
4	1	13821	Meter body
5	1	14960	Flow straightner 1in.
6	1	13509-01	Impeller
7	1	15218	Meter cover assy - 20m^3
8	1	13847	O-Ring
9	4	12112	Screw
10	2	15078	Adaptor coupling
11	1	13882	Impeller post

MODEL 9000H

ejector performance data

Please carefully note: *The indicated ejector data is for guidance only on the relative performance between sizes. Many factors influence actual performance, particularly the Ejector Draw Rate. As a result, the Brine Draw & Slow Rinse phase of the regeneration cycle should be established as part of the on site commissioning procedure.*