# 2401D SERIES

## Technical Manual

Erie™
Water Treatment Controls

— A Division of Aquion, Inc.

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# Introduction

The electronic 2401D is a 4-cycle regeneration duplex control valve system for continuous softening of drinking and feed water supplies. The unique motor driven rotor assembly has a minimum of moving parts; together with the 1- piece Noryl® body, this guarantees extremely high flow rates and exceptional reliability. The microprocessor controlled programmer with NOVRAM®, offers You unrivalled application flexibility for use in demand initiated with days override systems; its 3-button cntrol pad with LCD display sets new standards concerning programming simplicity; all parameters can be programmed individually for the master and for the slave valve, independent from each other. The control valves are designed for hard water bypass during regeneration, but an external solenoid operated diaphragm valve (service valve) at the outlet of each control valve, closes the outlet during regeneration/stand-by, in order to prevent hard water bypass. A built in adjustable blending device for mixing hard and soft water to suit the particular needs of each installation, is a standard feature. The control valves requires only an aircheck; a conventional float-controlled brine valve system can be used as a double security. The following sequence is followed:

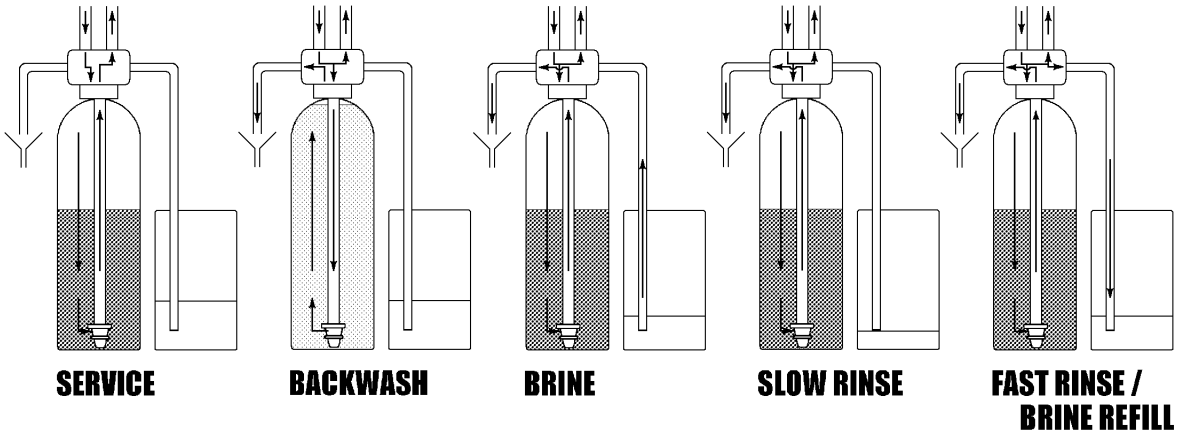
1. **SERVICE:**
   Untreated water flows down through the resin bed and up through the riser tube; the water is conditioned when passing through the resin. The throughput is dependent on the maximum permissible pressure drop for the complete water softener and the maximum permissible specific load of the resin (generally taken as 40 litres soft water per hour per litre resin).

2. **BACKWASH:**
   Water flows down through the riser tube and up through the resin bed to drain; the resin bed is fully expanded and all foreign materials are thoroughly washed from the resin, allowing a good brine cycle to occur.

3. **BRINE:**
   Salt brine, drawn from the brine tank by the injector, slowly flows down through the resin bed and up through the riser tube to drain; the resin is being regenerated when the salt brine passes through. The brine cycle is terminated when the air check is shut.

4. **SLOW RINSE:**
   Slow rinse continues for the remainder of the brine cycle; the injectors motive water slowly flows down through the resin bed and up through the riser tube to drain, slowly washing the brine from the resin tank.

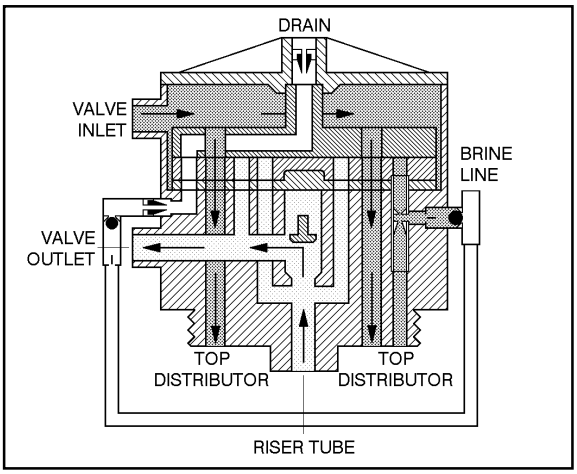
5. **FAST RINSE/BRINE REFILL:**
   Water flows to the brine tank and at the same time down through the resin bed and up through the riser tube to drain, ensuring that all traces of brine are washed out and that the resin bed is compacted. The resin bed is now ready for the next service cycle.



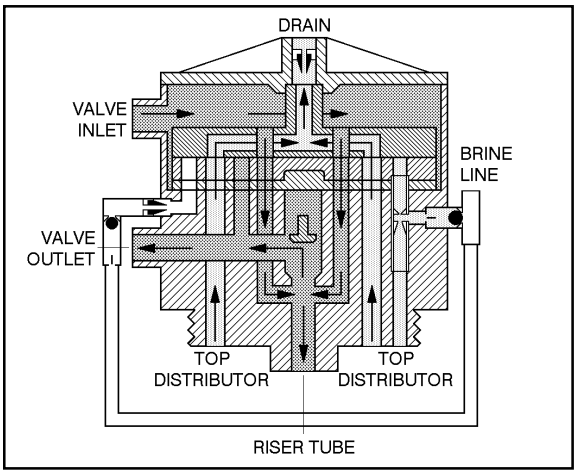
# Technical Specifications

| | |
|---|---|
| • Valve body material | Glass filled Noryl® |
| • Connections | |
| - inlet/outlet | Brass adaptors BSP, 1” male |
| - drain line | 3/4” NPT with hose barb 13 mm |
| - brine line | Compression fitting 3/8” polytube |
| - tank | 2 1/2” - 8 NPSM |
| - riser tube | 1,050” / 26,7 mm |
| • Mixing valve | Standard |
| • Flow rates (valve with riser) | |
| - service | Kv = 5,5 / Cv = 6,4 |
| - backwash | Kv = 1,7 / Cv = 2,0 |
| - fast rinse | Kv = 1,0 / Cv = 1,2 |
| • Application | Duplex softener 7” - 16” |
| • Operating pressure | 1,4 - 8,3 bar / 20 - 120 psi |
| • Operating temperature | 2 - 48 °C / 35 - 120 °F |
| • Electrical rating | 24V - 50 Hz, max. 1.200 mA |
| • Regeneration | 4 cycles, co-current brining |
| • Controller | Electronic with µ-processor and NOVRAM® |
| - software | FullFlex |
| - regeneration initiation | Demand with days override |
| - regeneration type | Immediate |
| - days override | Adj. (separate for Master/Slave): OFF, 1 - 30 days |
| - total capacity | Adj. (separate for Master/Slave): 100 - 999.900 L |
| - backwash | Adj. (separate for Master/Slave): 0 - 99 min |
| - brine/slow rinse | Adj. (separate for Master/Slave): 0 - 99 min |
| - fast rinse/refill | Adj. (separate for Master/Slave): 0 - 99 min |
| • Flow meter accuracy | 1,4 - 115 L/min: ±10% |

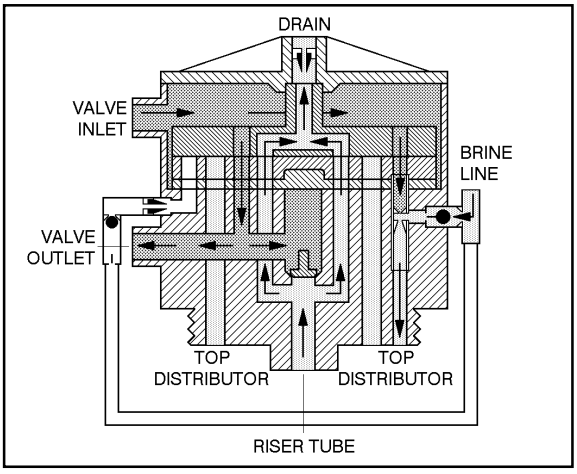
# Flow Diagrams



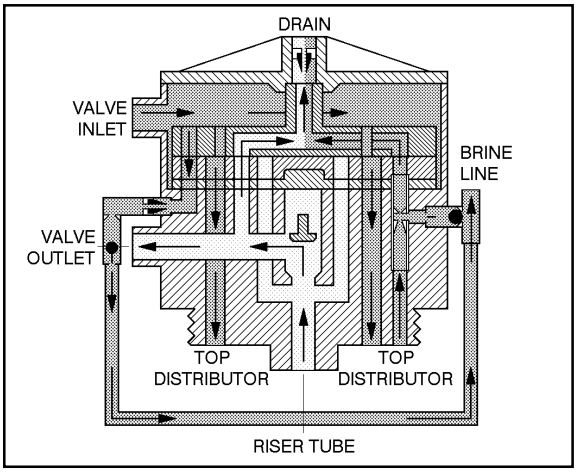

***SERVICE***



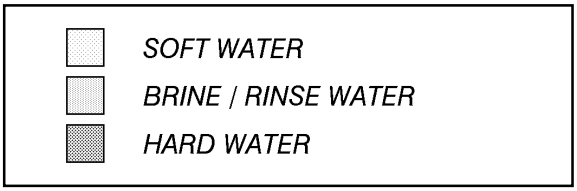

***BACKWASH***




***BRINE / SLOW RINSE***




***FAST RINSE / BRINE REFILL***



# Injector & Flow Control Selection

## Injector

The injector determines the brine concentration (ratio between brine suction and rinse water) and the brine flow through the resin bed, thus the contact time between brine and resin. Injector performances vary significantly with inlet pressure.

| Press. | Inj. 4 (PURPLE) | | Inj. 1 (RED) | | Inj. 2 (YELLOW) | | Inj. 5 (GREEN) | |
|---|---|---|---|---|---|---|---|---|
| inlet | Brine | Rinse | Brine | Rinse | Brine | Rinse | Brine | Rinse |
| bar | L/min | L/min | L/min | L/min | L/min | L/min | L/min | L/min |
| 1,38 | 0,64 | 0,72 | 1,32 | 1,21 | 1,63 | 1,86 | 1,14 | 3,14 |
| 2,07 | 0,64 | 0,91 | 1,63 | 1,40 | 1,97 | 2,08 | 1,48 | 3,56 |
| 2,76 | 0,64 | 0,98 | 1,82 | 1,51 | 2,23 | 2,27 | 1,70 | 3,94 |
| 3,45 | 0,68 | 1,06 | 2,01 | 1,63 | 2,42 | 2,46 | 1,97 | 4,28 |
| 4,14 | 0,68 | 1,17 | 2,04 | 1,78 | 2,61 | 2,65 | 2,20 | 4,58 |

**!!! The following table is only an indication and is valid for an inlet pressure of 3 bar and a bed height of 30".**

| ∅ Tank | | Injector | |
|---|---|---|---|
| inch | mm | Nr. | Colour |
| 7 | 178 | 4 | PURPLE |
| 8 | 203 | 4 | PURPLE |
| 9 | 229 | 4 | PURPLE |
| 10 | 254 | 1-4 | RED-PURPLE |
| 12 | 305 | 1 | RED |
| 13 | 330 | 1 | RED |
| 14 | 356 | 2-1 | YELLOW-RED |
| 16 | 406 | 5-2 | GREEN-YELLOW |

## Backwash flow control

The backwash flow control determines the resin bed expansion during backwash, independent of the inlet pressure. The optimal bed expansion is generally obtained at a backwash flow of 1,8 L/min per $dm^2$ of resin bed surface.

| ∅ Tank | | Backwash F.C. | | |
|---|---|---|---|---|
| inch | mm | Nr. | Gal/min (L/min) | |
| 7 | 178 | E | 1,6 | (6,1) |
| 8 | 203 | E | 1,6 | (6,1) |
| 9 | 229 | G | 2,0 | (7,6) |
| 10 | 254 | J | 2,6 | (9,8) |
| 12 | 305 | K | 3,5 | (13,2) |
| 13 | 330 | L | 4,0 | (15,1) |
| 14 | 356 | M | 5,0 | (18,9) |
| 16 | 406 | N | 6,0 | (22,7) |

# Brine refill flow control

Together with the time of the fast rinse/brine refill cycle, the brine refill flow control determines the quantity of refill to the brine tank, independent of the inlet pressure:

**flow control x cycle time = quantity of refill**

Do mind that the fast rinse/brine refill cycle can only be set by increments of 1 min!

**!!! The following tables are only an indication and are valid for a brine valve with a refill rate that equals or exceeds the rate of the refill flow control.**

| Brine refill F.C. | | | Program: 3e cycle | Quantity of refill |
|---|---|---|---|---|
| Nr. | Gal/min (L/min) | | min | L (±10 %) |
| A | 0,25 | (1,0) | 4 | 3,8 |
| A | 0,25 | (1,0) | 6 | 5,7 |
| A | 0,25 | (1,0) | 8 | 7,6 |
| A | 0,25 | (1,0) | 10 | 9,5 |
| B | 0,5 | (1,9) | 6 | 11,4 |
| B | 0,5 | (1,9) | 8 | 15,1 |
| B | 0,5 | (1,9) | 10 | 18,9 |
| D | 1,0 | (3,8) | 6 | 22,7 |
| D | 1,0 | (3,8) | 8 | 30,3 |
| D | 1,0 | (3,8) | 10 | 37,9 |
| D | 1,0 | (3,8) | 12 | 45,4 |
| / | $K_v$ = 0,27 | | / | / |

| ∅ Tank | | Brine refill F.C. |
|---|---|---|
| inch | mm | Nr. |
| 7 | 178 | A-B |
| 8 | 203 | A-B |
| 9 | 229 | B |
| 10 | 254 | B-D |
| 12 | 305 | D |
| 13 | 330 | D |
| 14 | 356 | D |
| 16 | 406 | / |

# Installation

## Assembly

For proper assembly of control valve and resin tank, proceed as follows:

1. Rinse the resin tank well before use.
2. Attach the lower distributor to the riser tube using PVC-glue or a stainless steel pin.
3. Lower the riser tube into the resin tank so that it touches the bottom.
4. Cut the riser tube 13 mm (= 1/2") below the top of the tank threads and chamfer the tube to prepare for insertion into the control valve.
5. Temporary plug the top of the riser tube to prevent resin from entering the tube and fill the tank with resin for max. 3/4 full.
6. Make sure the O-ring in the riser insert of the control valve is in the correct position; screw the upper distributor onto the control valve.
7. Lubricate the threads, the top of the riser tube and the tank O-ring of the control valve.
8. Lower the control valve straight down onto the riser tube and screw it onto the tank.

## Installation

**!!! ATTENTION**

- For proper functioning of the unit, incoming water pressure should be between a minimum of 1,4 bar during regeneration and a maximum of 8,3 bar in service; if necessary, a pressure reducer must be installed ahead of the system.
- Installation must only be undertaken by a person competent in plumbing.
- All plumbing and electrical connections must be done in accordance with local codes.
- Do not install the unit too close to a water heater (min. 3 m of piping between outlet of unit and inlet of heater); water heaters can sometimes transmit heat back down the cold pipe into the control valve; always install a check valve at the outlet of the system.
- If the control valve system is not equipped with a bypass, a three valve bypass system must be installed to enable bypassing during servicing.

For proper installation of the unit, proceed as follows:

1. **Inlet/outlet**: connect the pre-assembled connection kits, *with the manual ball valve*, to the inlet of the control valves; connect the pre-assembled connection kits, *with the motorised service valve*, to the outlet of the control valves; when facing the front of the control valve, the inlet is at the left and the outlet at the right side. Connect the master and slave valve to each other using the 2 flexibles.
2. **Drain lines**: connect a hose to the drain line fitting on the control valves and secure it; insert the drain hoses into a standpipe, with siphon if required; make sure the drain hoses are:
    - as short as possible,
    - not elevated too much,
    - free of kinks,

   as this will all create undesired counter-pressure.
3. **Brine lines**: an aircheck for each control valve is required for proper brining during regeneration, but a float-controlled brine valve system can be used as a double security; 3/8" polytube must be used to connect the brine systems to the control valves; do not overtighten the nuts.
4. **Turbine assembly**: install the flow meter sensor to the turbine housing and fix it with the screw.
5. **Solenoid operated diaphragm valves (normally closed)**: make sure the diaphragm valve's flow direction is respected. Connect the cable of both solenoids to the corresponding contacts in the timer head of the corresponding control valve; refer to wiring diagram on pg. 18 for proper lead connections.

6. **Slave valve**: plug the slave cable with DIN plugs into the DIN sockets at the back side of the timer heads.
7. **Transformer**: make sure the power source carries the same rating as the transformer; plug transformers output lead (with plug ø 2,5 mm x 5,5 mm) into socket at the timers power lead and plug transformer into socket; the connection can be secured by means of the wire clip.

# Installation check-out

When installation has been completed, the unit is ready to be placed into service. Proceed as follows, while checking the unit for any leakages:

1. Place unit in bypass and turn on main water supply; open a cold water tap nearby and allow water to run for a few minutes until all foreign material that may have resulted from the installation is washed out; close the tap.
2. Open the manual valves at the inlet of both control valves.
3. Carefully open a cold water tap and allow water to run for at least 2 minutes to set the resin bed and purge air from the system; close the tap.
4. Program the control valve according to the specific installation (refer to "Programming" on pg. 9).
5. Push the ***scroll*** button until the display shows:

```
Regen in 10 sec
```

6. Leave the control valve in this position; the countdown timer will countdown to 0 sec and start a regeneration of the master valve.
7. The motor will start and the display will show:

```
Rgn1: X Cyc1:Y
```

8. You can push the ***scroll*** button again to switch the motor to full speed, which will shorten the transfer time needed by the control valve to reach the next position.
9. The motor will move the master valve into backwash position; allow water to run to drain until all of the air is purged from the system.
10. Fill the brine tank of the master system with water, higher then the air-check level.
11. Push the ***scroll*** button; the motor will start and the display will show:

```
Rgn1: X Cyc2:Y
```

12. The motor will move the master valve into brine/slow rinse position; allow it to draw water from the brine tank until the aircheck closes.
13. Push the ***scroll*** button; the motor will start and the display will show:

```
Rgn1: X Cyc3:Y
```

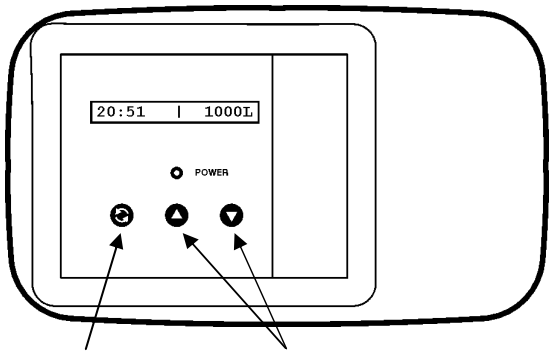
14. The motor will move the master valve into fast rinse/brine refill position; allow water to run to drain and brine tank for the entire cycle time, to fill the brine tank to the programmed level.
15. After a while the motor will have moved the master valve back into service position.
16. Repeat this procedure for the slave system (Rgn2).
17. Add salt to the brine tanks.

# Mixing valves

To adjust the residual hardness, the incorporated mixing valves must be regulated in function of the hardness of the incoming water and the desired residual hardness

- To increase the residual hardness: turn screw counter clockwise.
- To decrease the residual hardness: turn screw clockwise.

# The Electronic Timer




***scroll button*** to advance through the parameters

***up / down buttons*** to adjust the value of the parameter

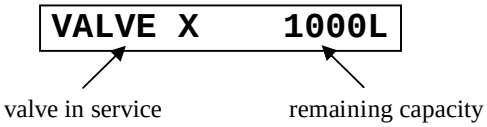
## Basic features

### Control pad

The electronic timer uses a Printed Circuit Board (PCB), equipped with a microprocessor and NOVRAM®. All programming is done by use of the 3-button control pad with LCD-display.

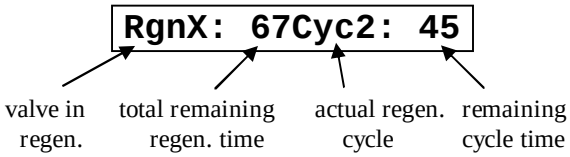
### Service mode

In **service mode** the display shows which control valve is in service and it's remaining capacity:




### Regeneration mode

In **regeneration mode** the display shows which control valve is in regeneration, the total remaining regeneration time, the actual regeneration cycle and the remaining cycle time:




The control valve can be **reset to service mode** at any time by pushing the ***scroll*** button, thus manually advancing it through the regeneration cycles.

### Flow meter

In **service mode** the display shows which valve is in service and it's remaining capacity; the remaining capacity counter counts back per unit, i.e. per litre or gallon. By opening a faucet after the unit, the correct functioning of the flow meter can be checked by means of this counter.

### Power failure

In the event of a power failure, the program remains stored in the NOVRAM® during an undefined period. When the power failure occurs during the execution of an **automatic** regeneration, the control valve will remain in it's last position; when the power supply is re-established, the control valve will return to the service position, stay there for 60 sec. and restart a complete regeneration from the beginning.

## Timer failure

In the event of a timer failure, the display will show the message:

**Service Required**

In such case, entering one of the programming levels can possibly solve the problem. However if the problem persists, professional service is required.

# Programming

### !!! ATTENTION

- During programming, it is necessary to enter the desired change within 60 sec. Otherwise the microprocessor will automatically break off the programming and return to the service mode, *while all possibly entered changes to the program are lost*. If this occurs, it will be necessary to re-initiate the programming process.
- All programming parameters are grouped into different user-specific levels (end-user / installer / OEM / factory). The end-user level is accessible freely, no specific access code is required; in order to access one of the 3 other specific levels, the proper access code, i.e. key sequence, needs to be entered.
- In the programming modes, a *flashing* indication implicates that this parameter can be adjusted by pushing the ***up*** ▲ button or ***down*** ▼ button; in this technical manual this is indicated by means of an *italic* font.

## Programming instructions for the End-User level

1. **Accessing the End-User level:**
   - Make sure that the control valve is in the service mode.
   - Push the ***scroll*** button; the display will show:

     ***Holiday***

   - You are now in the End-User level; use the ***scroll*** button to advance through the different programming parameters.

2. **Available programming parameters:**
   1) **Holiday mode:**
      - The display will show:

        ***Holiday***

      - If the control valve is left in this position for 60 sec, it will go into holiday mode, meaning *the unit will not regenerate*.
      - The holiday mode is cancelled when a flow rate greater than 6 L/min is measured or when the ***scroll*** button is pushed. In either of these cases the unit will start an immediate regeneration.

   2) **Immediate regeneration mode:**
      - The display will show:

        **Regen in 10 sec**

      - If the control valve is left in this position, the countdown timer will countdown to 0 sec and *start a regeneration on the control valve that is in service mode*.
      - To cancel this mode, push the ***scroll*** button before the countdown timer has reached 0 sec.

## Programming instructions for the Installer level

1. **Accessing the Installer level:**
   - Make sure that the control valve is in the service mode.
   - Push the ***down*** button and hold it for 5 sec until the display shows:

     | System Check |
     |---|

   - Within 10 sec, enter the Installer level access code, by pushing in the following key sequence:
     ***down*** button / ***down*** button / ***scroll*** button / ***down*** button.
   - You are now in the Installer level; use the ***scroll*** button to advance through the different programming parameters.

2. **Exiting the Installer level:**
   - Push the ***scroll*** button until the display shows:

     | Exit |
     |---|

   - Push the ***up*** button or ***down*** button to save the program to the NOVRAM® and exit the Installer level.

3. **Available programming parameters:**
   1) **Capacity/System - master system *(depending on the Capacity setting on the OEM level)*:**
      - ❖ In case of **Capacity**:
        - The display will show:

          | Capacit1: *1000*L |
          |---|

        - Push the ***up*** button or ***down*** button to *set the volume of softened water between regenerations for the master system* in increments of 100L.

      - ❖ In case of **System** *(not available in case units are set to "Metric" in the OEM level)*:
        - The display will show:

          | System1:*24000*Grn |
          |---|

        - Push the ***up*** button or ***down*** button to *set the softening capacity between regenerations for the master system* in increments of 1000 Grn.

      *!!! In order for this new setting to become active, it is necessary to execute a <u>complete</u> regeneration.*

   2) **Capacity/System - slave system *(depending on the Capacity setting on the OEM level)*:**
      - ❖ In case of **Capacity**:
        - The display will show:

          | Capacit2: *1000*L |
          |---|

        - Push the ***up*** button or ***down*** button to *set the volume of softened water between regenerations for the slave system* in increments of 100L.

      - ❖ In case of **System** *(not available in case units are set to "Metric" in the OEM level)*:
        - The display will show:

          | System2:*24000*Grn |
          |---|

        - Push the ***up*** button or ***down*** button to *set the softening capacity between regenerations for the slave system* in increments of 1000 Grn.

      *!!! In order for this new setting to become active, it is necessary to execute a <u>complete</u> regeneration.*

3) **WaterHard** ***(not available in case units are set to "Metric" in the OEM level)*****:**
   - The display will show:

     **WaterHard:*28* Grn**

   - Push the ***up*** ▲ button or ***down*** ▼ button to *set the water hardness between 0 and 99 grains*.

4) **Reset flow** ***(not available in case flow meter type is set to "No Meter" in the OEM level)*****:**
   - The display will show:

     **Reset Flow? *NO***

   - Push the ***up*** ▲ button or ***down*** ▼ button to *reset the stored peak flow rate and average daily water usage to default settings.*

5) **Days override - master valve:**
   - The display will show:

     **Override1: *4d*ays**

   - Push the ***up*** ▲ button or ***down*** ▼ button to s*et the number of days between regenerations for the master system* from "OFF" to max. 30 days.

6) **Days override - slave valve:**
   - The display will show:

     **Override2: *4d*ays**

   - Push the ***up*** ▲ button or ***down*** ▼ button to s*et the number of days between regenerations for the slave system* from "OFF" to max. 30 days.

7) **Cycle 1 - master valve:**
   - The display will show:

     **1 Cycle 1: *10*min**

   - Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the backwash cycle for the master system* from 0 to max. 99 min.

8) **Cycle 2 - master valve:**
   - The display will show:

     **1 Cycle 2: *60*min**

   - Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the brine/slow rinse cycle for the master system* from 0 to max. 99 min.

9) **Cycle 3 - master valve:**
   - The display will show:

     **1 Cycle 3: *5*min**

   - Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the fast rinse/brine refill cycle for the master system* from 0 to max. 99 min.

10) **Cycle 1 - slave valve:**
   - The display will show:

     **2 Cycle 1: *10*min**

   - Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the backwash cycle for the slave system* from 0 to max. 99 min.

**11) Cycle 2 - slave valve:**

- The display will show:

```
2 Cycle 2: 60min
```

- Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the brine/slow rinse cycle for the slave system* from 0 to max. 99 min.

**12) Cycle 3 - slave valve:**

- The display will show:

```
2 Cycle 3:  5min
```

- Push the ***up*** ▲ button or ***down*** ▼ button to *set the length of the fast rinse/brine refill cycle for the slave system* from 0 to max. 99 min.

**13) Turbine type:**

- The display will show:

```
MTR:SNAP SENSOR
```

- Push the ***up*** ▲ button or ***down*** ▼ button to *set the turbine to "SNAP SENSOR" or "SCREW SENSOR"*.
  - ❖ Select "**SNAP SENSOR**" for the new flow meter configuration with 'snap-fit' flow meter cable.
  - ❖ Select "**SCREW SENSOR**" for the old flow meter configuration with 'screw-on' flow meter cable.

## Programming instructions for the OEM level

1. **Accessing the OEM level:**
   - Make sure that the control valve is in the service mode.
   - Push the ***down*** button and hold it for 5 sec until the display shows:

     `System Check`

   - Within 10 sec, enter the OEM level access code, by pushing in the following key sequence:
     ***down*** button / ***scroll*** button / ***up*** button / ***up*** button / ***scroll*** button.
   - You are now in the OEM level; use the ***scroll*** button to advance through the different programming parametres.

2. **Exiting the OEM level:**
   - Push the ***scroll*** button until the display shows:

     `Exit`

   - Push the ***up*** button or ***down*** button to save the program to the NOVRAM® and exit the OEM level.

3. **Available programming parameters:**

   **1) Units:**
   - The display will show:

     `Units:Metric`

   - Push the ***up*** button or ***down*** button to *set the units to "Metric" or "English-US"*.

   **2) Flow meter type:**
   - The display will show:

     `Std Meter`

   - Push the ***up*** button or ***down*** button to *set the flow meter to "SNAP SENSOR" (Erie Hall-effect, new model), "SCREW SENSOR" (Erie Hall-effect, old model), (Erie Hall-effect), "No Meter" or "Vol/Pulse" watermeter*.
     - ❖ Select "**SNAP SENSOR**" for the new flow meter configuration with 'snap-fit' flow meter cable.
     - ❖ Select "**SCREW SENSOR**" for the old flow meter configuration with 'screw-on' flow meter cable.
     - ❖ In case of "**Vol/pulse**":
       - The display will show:

         `Vol/Pulse = 1000`

       - Push the ***up*** button or ***down*** button to s*et the litres per pulse ratio of the water meter* from 1 to 1000.

   **3) Capacity (*not programmable in case units are set to "Metric" in the OEM level)*:**
   - The display will show:

     `Capacity:Volume`

   - Push the ***up*** button or ***down*** button to *set the capacity to "Volume" or "Hardnes"*.
     - ❖ In case of "**Volume**": in the Installer level the volume of softened water between regenerations is set in litres or gallons.
     - ❖ In case of "**Hardnes**": in the Installer level the softening capacity between regenerations is set in (volume x hardness) units;

**4) Regeneration type *(not programmable)*:**

- The display will show:

  **Regen:*Immediate***

  ❖ When the remaining capacity equals 0, an *immediate regeneration* on the control valve in service is started while the control valve in standby goes into service.

# Diagnostics level

1. **Accessing the Diagnostics level:**
   - Make sure that the control valve is in the service mode.
   - Push the ***up*** button and hold it for 5 sec until the display shows:

     | Regen Xdays ago |
     |---|

   - You are now in the Diagnostics level; use the ***scroll*** button to advance through the different diagnostics parameters.

2. **Exiting the Diagnostics level:**
   - Push the ***scroll*** button until the display shows:

     | Exit |
     |---|

   - Push the ***up*** button or ***down*** button to exit the Diagnostics level.

3. **Available diagnostic parameters *(depending on the Installer and OEM programming, some of the following parameters might not be available (*))*:**
   - **Regen X days ago**: display shows number of days since last regeneration of the unit.
   - **In Srvc**: displays show many days the unit has been in service.
   - **# of Regens**: display shows the number of regenerations that have taken place since installation.
   - **TankX in service**: display shows which control valve is in service.
   - **TotVol (*)**: display shows the total water usage through the unit since installation.
   - **LastRg@ (*)**: display shows the water usage at the moment of the last regeneration.
   - **Flow Rate (*)**: display shows the instantaneous flow rate.
   - **AvgVol (*)**: display shows the average daily water usage.
   - **Capacity/System1 (*)**: if the control valve is programmed for Volume, the display shows the setting of the volume of softened water between regenerations for the master system; when the control valve is programmed for Hardness, the display shows the setting of the total softening capacity between regenerations for the master system.
   - **Capacity/System2 (*)**: if the control valve is programmed for Volume, the display shows the setting of the volume of softened water between regenerations for the slave system; when the control valve is programmed for Hardness, the display shows the setting of the total softening capacity between regenerations for the slave system.
   - **WaterHard (*)**: display shows the setting of the water hardness.
   - **Override1**: display shows “OFF” or the setting of the number of days between regenerations for the master system.
   - **Override2**: display shows “OFF” or the setting of the number of days between regenerations for the slave system.
   - **1 Cycle 1**: display shows the setting of the length of the backwash cycle for the master system.
   - **1 Cycle 2**: display shows the setting of the length of the brine/slow rinse cycle for the master system.
   - **1 Cycle 3**: display shows the setting of the length of the fast rinse/brine refill cycle for the master system.
   - **2 Cycle 1**: display shows the setting of the length of the backwash cycle for the slave system.
   - **2 Cycle 2**: display shows the setting of the length of the brine/slow rinse cycle for the slave system.
   - **2 Cycle 3**: display shows the setting of the length of the fast rinse/brine refill cycle for the slave system.
   - **Units**: display shows the setting of the mode of measurement.
   - **Flow Meter Type**: display shows the flow meter type setting.
   - **Capacity (*)**: display shows whether the control is programmed for Volume or Hardness setting.
   - **Valve Type**: display shows the valve type setting.
   - **MP Resets**: display shows the number of resets of the microprocessor (*for factory purpose only*).
   - **Corrupt Memory**: display shows the number of corrupt memory start-ups (*for factory purpose only*).
   - **4000 VTL REV X**: display shows the software version (*for factory purpose only*).

# Fast program check

When you want to check if the unit is operating correctly, proceed as follows:

1. Plug unit into power supply.
2. Open water supply to valve.
3. Push the ***scroll*** button until the display shows:

```
Regen in 10 sec
```

4. Leave the control valve in this position; the countdown timer will countdown to 0 sec and start a regeneration of the master valve.
5. The motor will start and the display will show:

```
Rgn1: X Cyc1: Y
```

valve in service — total remaining regen. time — actual regen. cycle — remaining cycle time

6. You can push the ***scroll*** button again to switch the motor to full speed, which will shorten the transfer time needed by the control valve to reach the next position.
7. The motor will move the master valve into backwash position; check the drain line for clear flow.
8. Push the ***scroll*** button; the motor will start and the display will show:

```
Rgn1: X Cyc2: Y
```

valve in service — total remaining regen. time — actual regen. cycle — remaining cycle time

9. The motor will move the master valve into brine/slow rinse position; check brine draw by listening or feeling for suction.
10. Push the ***scroll*** button; the motor will start and the display will show:

```
Rgn1: X Cyc3: Y
```

valve in service — total remaining regen. time — actual regen. cycle — remaining cycle time

11. The motor will move the master valve into fast rinse/brine refill position; check the drain line for flow.
12. Push the ***scroll*** button; the motor will start and the display will show:

```
VALVE 2    1000L
```

13. The motor will move the master valve back into service position.
14. Repeat this procedure for the slave system (Rgn2).

# Synchronising the control valves

1. Unplug the power supply.
2. After ±15 sec plug unit back into power supply.
3. Push the ***scroll*** button until the display shows:

```
Regen in 10 sec
```

4. Leave the control valve in this position; the countdown timer will countdown to 0 sec and start a regeneration of the master valve.
5. Every time that he master valve stops in a regeneration position, push the ***scroll*** button again, thus manually advancing it through the regeneration cycles, until the display shows:

```
VALVE 2    1000L
```

6. The motor will move the master valve back into service position.
7. Push the ***scroll*** button until the display shows:

```
Regen in 10 sec
```

8. Leave the control valve in this position; the countdown timer will countdown to 0 sec and start a regeneration of the slave valve.
9. Every time that he slave valve stops in a regeneration position, push the ***scroll*** button again, thus manually advancing it through the regeneration cycles, until the display shows:

```
VALVE 1    1000L
```

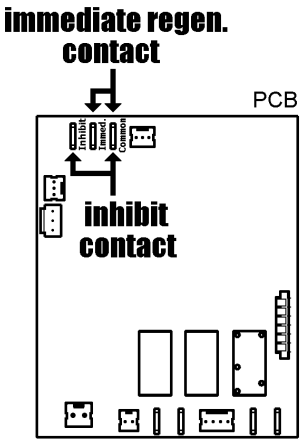
10. The motor will move the slave valve back into service position.

The master and slave valve are now both synchronised in service position.

# External contacts

## Immediate regeneration contact

When this voltage-free input contact is closed, the control valve will *start an immediate regeneration*.




## Inhibit contact

When this voltage-free input contact is closed, the control valve will *NOT be able to start any kind of regeneration* (automatic nor manual).

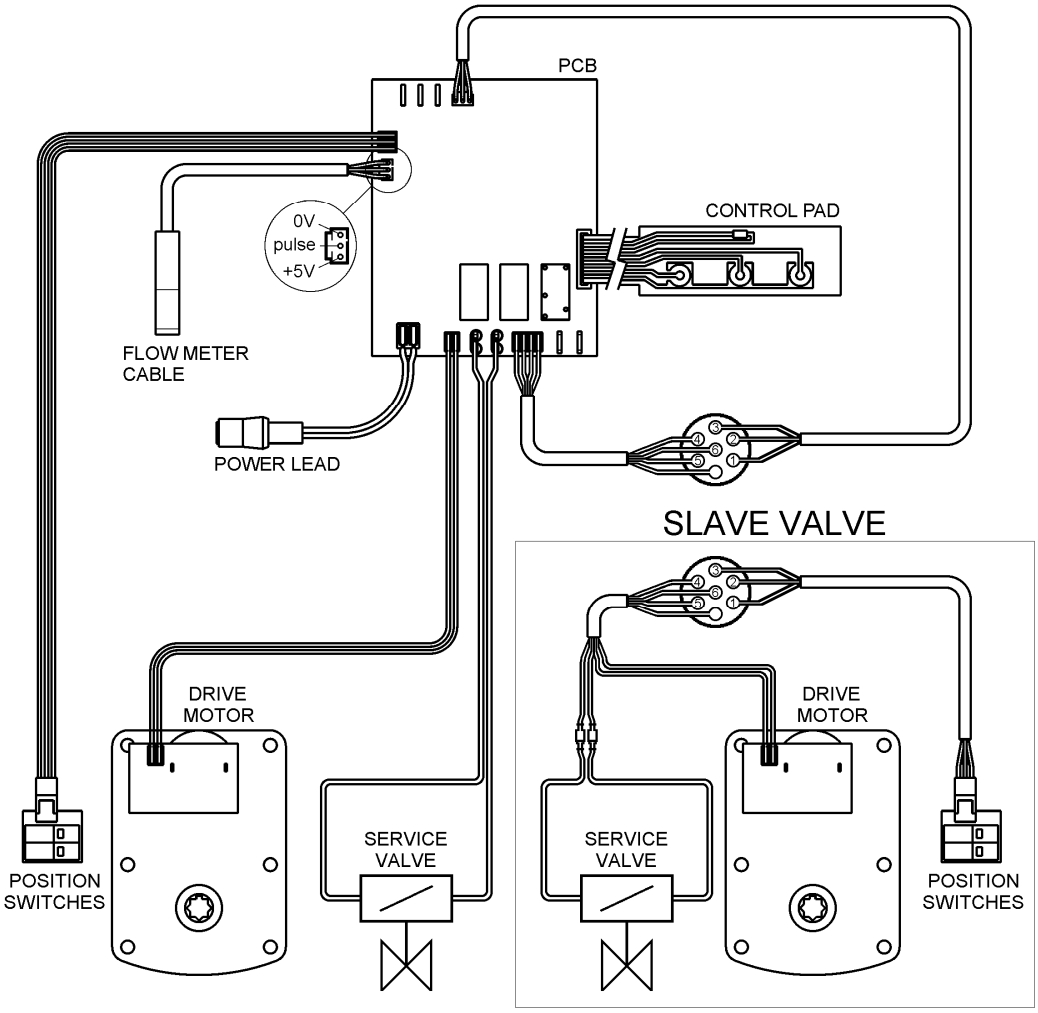
# Parts Replacement

**!!! BEFORE SERVICING:**

- **MAKE SURE THE CONTROL VALVES ARE IN SERVICE POSITION**
- **DISCONNECT ALL ELECTRICAL POWER TO THE UNIT**
- **BYPASS OR DISCONNECT THE WATER SUPPLY**
- **RELIEF THE WATER PRESSURE**

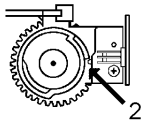
## Printed Circuit Board

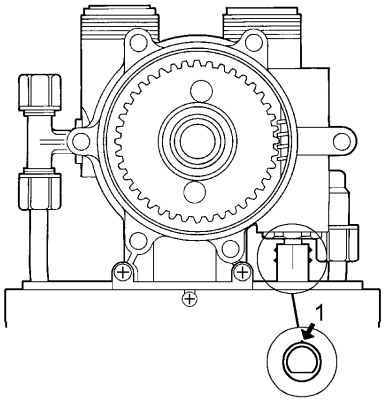
1. Loosen the 3 front cover screws and remove the front cover.
2. Disconnect all connectors from the PCB.
3. Remove the flat cable of the 3-button control pad from the push-in connection on the PCB.
4. Remove the screw holding the PCB in place.
5. Push aside the clip holding the PCB in place and remove the PCB.
6. Reverse the procedure for reassembly; refer to wiring diagram for proper lead connections.



# Drive motor

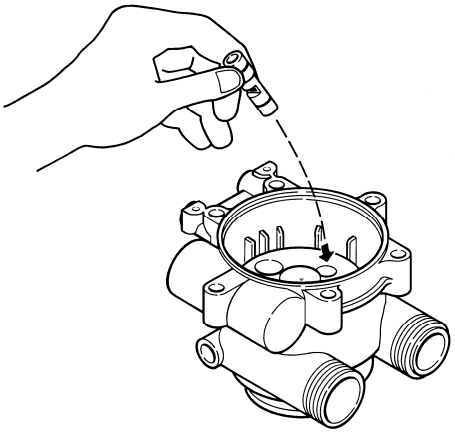
1. Remove the timer head assembly; refer to Parts Replacement “Timer head assembly”.
2. Loosen the 3 front cover screws and remove the front cover.
3. Disconnect the wire connector from the drive motor.
4. At the back of the back plate, remove the 2 screws holding the drive motor assembly in place and remove the micro switch assembly and drive motor.
5. Remove the retaining ring securing the worm and remove the worm from the drive shaft.
6. Pull the drive shaft out of the drive motor.
7. Install the drive shaft in the drive motor, with the flat side on the drive shaft pointing down (mark on the drive shaft pointing up (1)).
8. Install the worm on the drive shaft and install the retaining ring securing the worm.
9. Put the micro switch assembly on the drive motor; make sure the switch cam is in the service position (2).
10. Install the micro switch assembly and drive motor on the back plate and secure it with the 2 screws.
11. Connect the wire connector on the drive motor; refer to wiring diagram for proper connection.
12. It is now necessary to check the synchronisation of valve body and timer head; refer to to Parts Replacement “Synchronising valve body and timer head”.

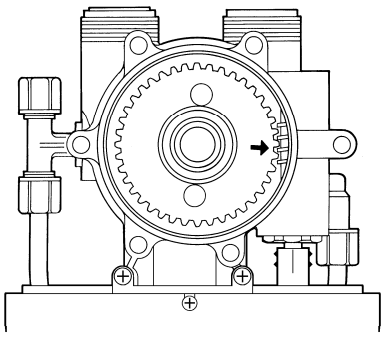



# Injector

1. Remove the drain hose from the drain elbow.
2. Remove the 6 bolts holding the valve body and cover together.
3. Lift the valve cover away from the valve body.
4. Remove the rotor assembly from the valve cover; the white Teflon O-ring will remain in the valve cover.
5. Remove the seal plate from the valve body.
6. Remove the insert plate and gasket from the valve body.
7. Using a needle nose pliers grasp one side of the injector and pull the injector straight out of the valve body.
8. Make sure the float valve is straight up into the float chamber of the valve body.
9. Install the insert plate and gasket in the valve body.
10. Lightly lubricate the O-rings of the new injector with a soap water solution.
11. Install the injector with one of the rectangular openings on the injector facing directly towards the centre of the valve body; push the injector firmly down.
12. Install the seal disk in the valve body, with the green side facing up.
13. Install the rotor assembly into the valve body ensuring that the arrow on the worm gear is pointing directly towards the second tooth on the worm drive shaft (facing the front of the control valve); the 2 holes in the rotor assembly should now be exactly aligned with the corresponding holes in the seal disk.
14. Centre the PVC sleeve on the worm gear.
15. Make sure the valve cover O-ring is clean and securely installed around the raised rib on the valve cover.
16. Lower the valve cover straight down onto the valve body and press it down firmly and evenly to seat the valve cover.
17. Install the 6 bolts and tighten them in a cross pattern.
18. Install the drain hose to the drain line fitting.





# Backwash flow control

1. Remove the drain hose from the drain elbow and remove the drain elbow.
2. Unscrew the backwash flow control using a 3/8" Allen wrench.
3. Reverse the procedure for reassembly.

# Brine refill flow control

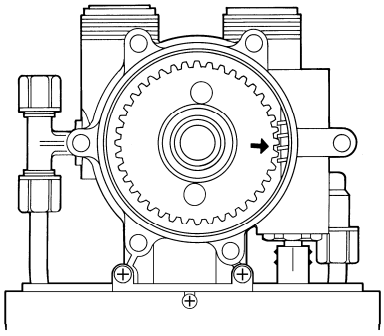
1. Remove the clip securing the refill elbow.
2. Remove the brine refill flow control from the refill elbow.
3. Reverse the procedure for reassembly.

# Brine tee

1. Remove the brine line and brine refill tube from the brine tee.
2. Remove the brine tee by turning it counter clockwise.
3. Remove the O-ring, the retainer and check ball from the brine tee.
4. Reverse the procedure for reassembly.

# Rotor assembly

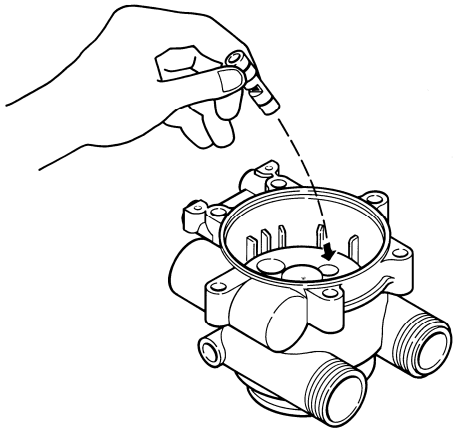
1. Remove the drain hose from the drain elbow.
2. Remove the 6 bolts holding the valve body and cover together.
3. Lift the valve cover away from the valve body.
4. Remove the rotor assembly from the valve cover; the white Teflon O-ring will remain in the valve cover.
5. Inspect the rotor plate's surface; it should be smooth and free of any circular grooves or scratches; replace if necessary.
6. Install the rotor assembly into the valve body ensuring that the arrow on the worm gear is pointing directly towards the second tooth on the worm drive shaft (facing the front of the control valve); the 2 holes in the rotor assembly should now be exactly aligned with the corresponding holes in the seal disk.
7. Centre the PVC sleeve on the worm gear.
8. Make sure the valve cover O-ring is clean and securely installed around the raised rib on the valve cover.
9. Lower the valve cover straight down onto the valve body and press it down firmly and evenly to seat the valve cover.
10. Install the 6 bolts and tighten them in a cross pattern.
11. Install the drain hose to the drain line fitting.



# Seal disk

1. Remove the rotor assembly; refer to Parts Replacement "Rotor assembly".
2. Remove the seal disk from the valve body.
3. Inspect the seal disk; make sure the raised ribs are intact; the green Teflon coating may be worn off of the ribs, but this won't affect the sealing performance of the seal disk; replace if necessary.
4. Use silicone base lubricant to lubricate the green side of the seal disk.
5. Install the seal disk in the valve body, with the green side facing up.
6. Reverse the procedure for reassembly; refer to Parts Replacement "Rotor Assembly".

# Gasket



1. Remove the seal disk; refer to Parts Replacement “Seal disk”.
2. Remove the insert plate and gasket from the valve body
3. Inspect the insert plate; make sure the ribs are intact.
4. Using a needle nose pliers grasp one side of the injector and pull the injector straight out of the valve body.
5. Clean the surface of the valve body.
6. Make sure the float valve is straight up into the float chamber of the valve body.
7. Install the insert plate and gasket in the valve body.
8. Install the injector with one of the rectangular openings on the injector facing directly towards the centre of the valve body; push the injector firmly down.
9. Reverse the procedure for reassembly; refer to Parts Replacement “Seal disk”.

# Float valve

1. Remove the gasket; refer to Parts Replacement “Gasket”.
2. Remove the float valve straight out of the float valve chamber of the valve body.
3. Remove the spring from the float valves shaft.
4. Clean all sealing surfaces inside of the float chamber.
5. Install the spring inside of the float valves shaft.
6. Install the float valve straight up into the float chamber of the valve body.
7. Reverse the procedure for reassembly; refer to Parts Replacement “Gasket”.

# Timer head assembly

1. *Master valve only*: remove the screw holding the flow meter sensor in place and remove the flow meter sensor.
2. Remove the 2 back plate mount screws and take away the timer head assembly.
3. Reverse the procedure for reassembly.

# Worm drive shaft

1. Remove the timer head assembly; refer to Parts Replacement “Timer head assembly”.
2. Unscrew the packing gland nut.
3. Remove the packing gland nut/worm drive shaft from the valve body.
4. Separate the packing gland nut from the worm drive shaft.
5. Inspect the worm drive shaft; the threads should not be deformed or damaged; replace if necessary.
6. Install the worm drive shaft in the valve body, by turning it clockwise as far as possible.
7. Lubricate the O-rings of the worm drive shaft.
8. Install the packing gland nut over the worm drive shaft and screw it into the valve body.
9. Install the timer head assembly to the valve body and tighten the 2 back plate mount screws.
10. It is now necessary to check the synchronisation of valve body and timer; refer to Parts Replacement “Synchronising valve body and timer head”.

# Flow meter turbine

1. Disconnect the flow meter connector from the flow meter housing.
2. Unscrew the outlet from the flow meter housing.
3. Unscrew the flow meter assembly from the connection kit.
4. Remove the adapter at the outlet of the flow meter assembly.
5. Pull out the hub from the outlet elbow.
6. Remove the impeller.
7. Reverse the procedure for reassembly

# Synchronising valve body and timer head

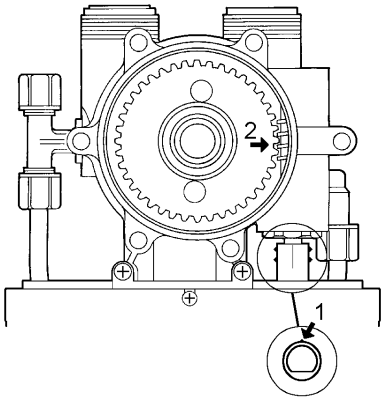
To insure the proper operation of the control valve, valve body and timer head should be synchronised in the service position. Proceed as follows:

*Step 1: Timer head*

1. Make sure that the control valves are in the service mode; if one of the control valves is in regeneration, push the ***scroll*** button, thus manually advancing it through the regeneration cycles, until the display shows the service mode:

   **VALVE X 1000L**

2. The flat side on the drive shaft of both control valves should be pointing down (mark on the drive shaft pointing up (1)); if this is not the case: refer to Parts Replacement "Drive motor".




*Step 2: Valve body (both Master and Slave valve)*

1. Remove the drain hose from the drain elbow.
2. Remove the 6 bolts holding the valve body and cover together.
3. Lift the valve cover away from the valve body.
4. Make sure the arrow on the worm gear is pointing directly towards the second tooth on the worm drive shaft (facing the front of the control valve) (2); the 2 holes in the rotor assembly should now be exactly aligned with the corresponding holes in the seal disk.
5. Make sure the valve cover O-ring is clean and securely installed around the raised rib on the valve cover.
6. Lower the valve cover straight down onto the valve body and press it down firmly and evenly to seat the valve cover.
7. Install the 6 bolts and tighten them in a cross pattern.
8. Install the drain hose to the drain line fitting.

# Troubleshooting

## Hard (untreated) water to service

| Cause | Solution |
|---|---|
| 1. Open or defective bypass | 1. Close or verify bypass |
| 2. Diaphragm valve not closing | 2. Verify diaphragm valves |
| 3. Leak between rotor and seal disk | 3. Verify or replace rotor and seal disk |
| 4. Loss of resin | 4. Refer to problem “Loss of resin” |
| 5. Mixing valve open | 5. Reduce mixing valve opening |
| 6. Change in raw water hardness | 6. Adjust programming accordingly |
| 7. Control valves out of synchronisation | 7. Synchronise control valves |
| 8. Valve body and timer out of synchronisation | 8. Synchronise valve body and timer |
| 9. Unit fails to regenerate | 9. Refer to problem “Unit fails to regenerate” |
| 10. Control valve fails to draw brine | 10. Refer to problem “Control valve fails to draw brine” |
| 11. Decreasing exchange capacity of resin | 11. Clean or replace resin bed |
| 12. No salt in brine tank | 12. Add salt |
| 13. Leak at riser tube | 13. Verify that riser tube is seated correctly and is not cracked |

## Unit fails to regenerate

| Cause | Solution |
|---|---|
| 1. Faulty electrical supply | 1. Verify electrical service (fuse, transfo,...) |
| 2. Defective flow meter | 2. Clean and/or replace flow meter |
| 3. Defective PCB | 3. Replace PCB |
| 4. Defective drive motor | 4. Replace drive motor |
| 5. Defective micro switch | 5. Replace micro switches |

## Control valve fails to draw brine

| Cause | Solution |
|---|---|
| 1. Low inlet pressure | 1. Verify operating pressure; must exceed 1,4 bar |
| 2. Plugged injector | 2. Clean injector |
| 3. Restricted drain line | 3. Verify drain line for kinks, verify backwash flow control to insure it is free of debris |
| 4. Restricted brine line | 4. Verify brine line for kinks or restrictions |
| 5. Leak in brine line | 5. Verify brine line and connections for air leakage |
| 6. Not enough water in brine tank | 6. Refer to problem “Control valve fails to refill brine tank” |

## Control valve cycles continuously

| Cause | Solution |
|---|---|
| 1. Defective or shorted micro switch | 1. Replace micro switches |

## Excessive water in brine tank

| Cause | Solution |
|---|---|
| 1. Control valve fails to draw brine | 1. Refer to problem "Control valve fails to draw brine" |
| 2. Improper fast rinse/brine refill time setting | 2. Verify that fast rinse/brine refill time corresponds to the proper salt level and amount of resin |
| 3. Improper or missing brine refill flow control | 3. Verify that flow control is installed and properly sized |
| 4. Leak between rotor and seal disk | 4. Verify or replace rotor and seal disk |

## Control valve fails to refill brine tank

| Cause | Solution |
|---|---|
| 1. Improper fast rinse/brine refill time setting | 1. Verify that fast rinse/brine refill time corresponds to salt level and amount of resin |
| 2. Improper refill flow control | 2. Verify that flow control is properly sized |
| 3. Plugged refill flow control | 3. Verify that flow control is free of debris |

## Unit uses too much salt

| Cause | Solution |
|---|---|
| 1. Excessive water in brine tank | 1. Refer to problem "Excessive water in brine tank" |
| 2. Unit regenerates too frequently | 2. Adjust programming |

## Salt water to service

| Cause | Solution |
|---|---|
| 1. Excessive water in brine tank | 1. Refer to problem "Excessive water in brine tank" |
| 2. Injector undersized | 2. Verify injector selection |
| 3. Improper brine/slow rinse time setting | 3. Verify that brine/slow rinse time corresponds to the proper salt level and amount of resin |
| 4. Improper fast rinse/brine refill time setting | 4. Verify that fast rinse time corresponds to the proper salt level and amount of resin |

## Loss of resin through drain line

| Cause | Solution |
|---|---|
| 1. Improper or missing backwash flow control | 1. Verify that flow control is installed and correctly sized |
| 2. Lower and/or upper distributor damaged | 2. Replace distributor(s) |
| 3. Leak between riser tube and upper distributor | 3. Verify that riser tube is seated correctly and is not cracked |

# Loss of water pressure

| Cause | Solution |
|---|---|
| 1. Mineral or iron build-up in resin tank | 1. Clean resin bed and control valve; increase regeneration frequency |
| 2. Plugged outlet manifold | 2. Remove and clean outlet |
| 3. Plugged lower and/or upper distributor | 3. Verify that distributors are free of debris |
| 4. Crushed lower and/or upper distributor | 4. Replace distributor(s) |

# Drain flows continuously

| Cause | Solution |
|---|---|
| 1. Defective PCB | 1. Replace PCB |
| 2. Defective micro switch | 2. Replace micro switches |
| 3. Defective drive motor | 3. Replace drive motor |
| 4. Control valves out of synchronisation | 4. Synchronise control valves |
| 5. Valve body and timer out of synchronisation | 5. Synchronise valve body and timer |
| 6. Leak between rotor and seal disk | 6. Verify or replace rotor and seal disk |

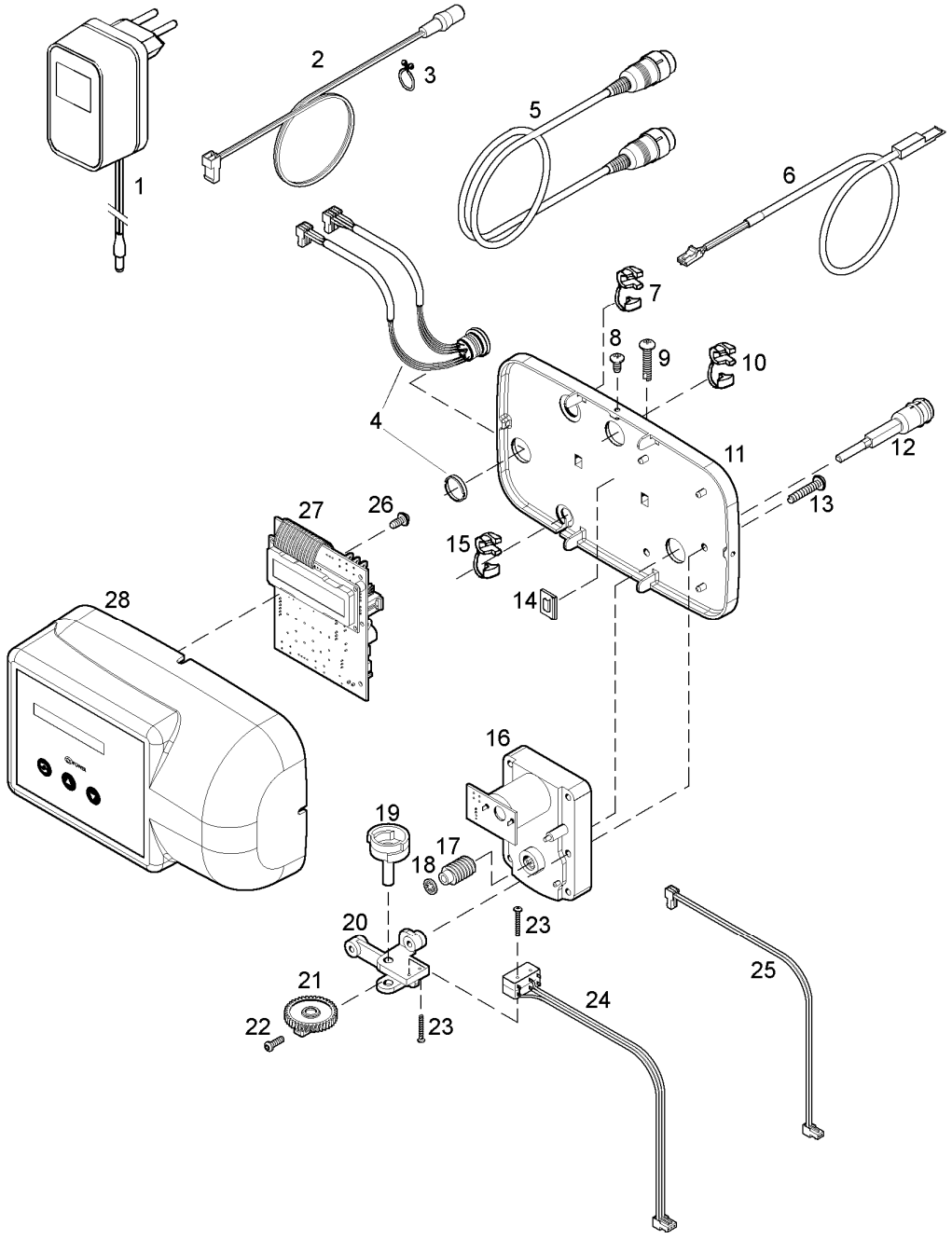
# Annual Maintenance

To assure the correct functioning of the control valve system, the following items must be checked annually:

1. Clean out injectors.
2. Clean brine refill flow controls.
3. Clean backwash flow controls.
4. Verify correct functioning of flow meter; clean impeller if necessary.
5. Verify programming of timer; re-program timer if necessary.
6. Verify correct execution of program (refer to “Fast program check” on pg. 17).
7. Measure the residual hardness; adjust mixing valves if necessary.
8. Verify min and max. pressure; install pressure reducer if necessary.

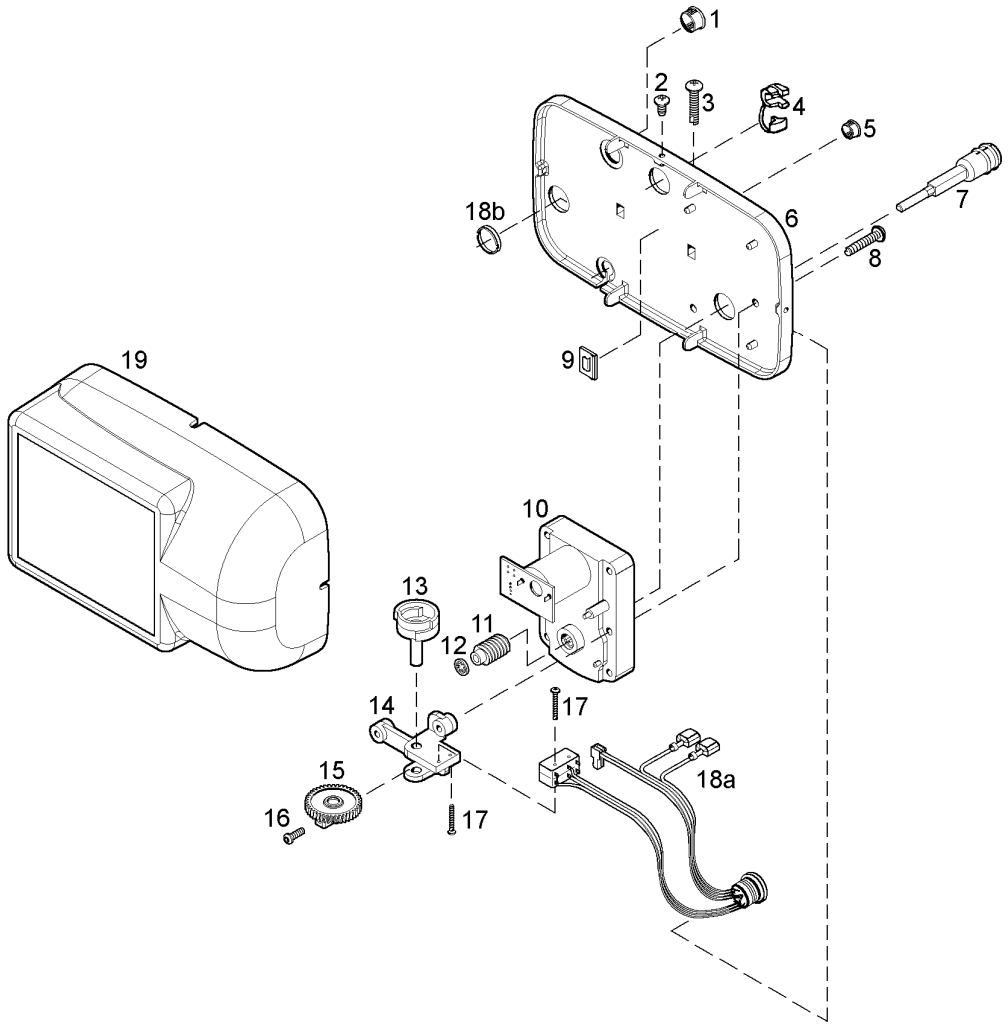
# Exploded Views & Part Numbers

## Electronic timer, master valve



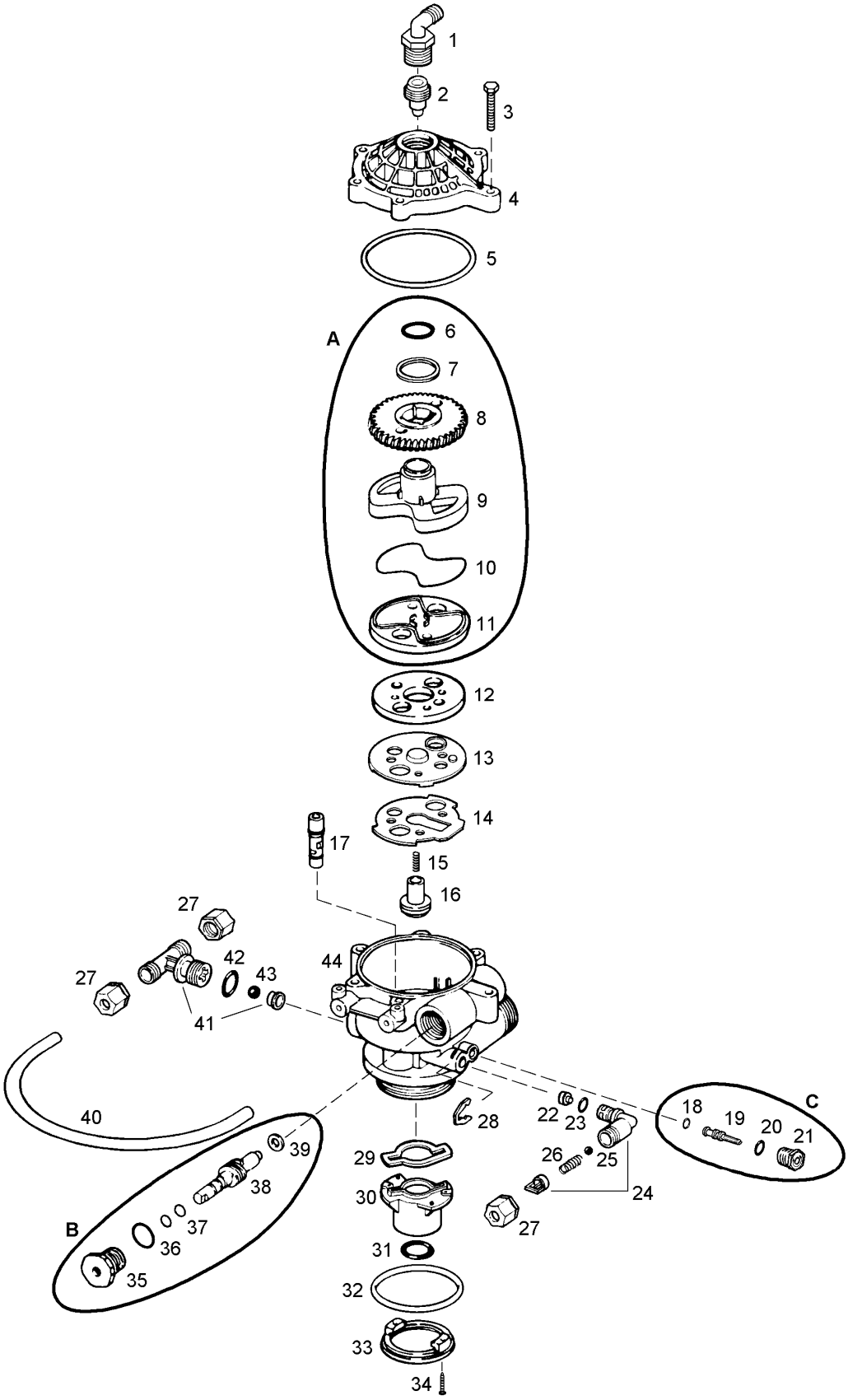
| ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|
| **1** | 28/299/11/IL<br>28/299/18/IL | Transfo 230/24V - 50 Hz, 35VA, EuroT plug<br>Transfo 230/24V - 50 Hz, 35VA, UK plug |
| **2** | 70971 | Power lead with plug |
| **3** | 72263 | Wire clip |
| **4** | 72371 | Socket and cable assy, master |
| **5** | 72372 | Slave cable with DIN plugs |
| **6** | 72576 | Sensor with cable |
| **7** | 28/8/7 | Strain relief, flow meter cable |
| **8** | 71502 | Screw, timer cover (3x) |
| **9** | 15/222 | Screw, back plate (2x) |
| **10** | 28/8/28 | Strain relief, service valve cable |
| **11** | 72369 | Back plate |
| **12** | 2100/206 | Drive shaft |
| **13** | 15/222 | Screw, drive motor assy (2x) |
| **14** | 28/245/4 | Cable clamp |
| **15** | 70312 | Strain relief, power lead |
| **16** | 72261 | Drive motor |
| **17** | 568/227/2 | Worm |
| **18** | 19/48 | Retaining ring |
| **19** | 70965 | Switch cam |
| **20** | 568/386 | Bracket, micro switches |
| **21** | 568/310 | Gear, switch cam |
| **22** | 15/184/7 | Locking screw, switch cam |
| **23** | 15/173/12 | Screw, micro switches (2x) |
| **24** | 72451 | Micro switch assy |
| **25** | 71679 | Cable set, drive motor |
| **26** | 15/102 | Screw, PCB |
| **27** | 72285 | Printed Circuit Board 2401D |
| **28** | 72252 | Timer cover |

# Timer, slave valve



| ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|
| **1** | 28/244/1 | Plug (large) |
| **2** | 71502 | Screw, timer cover (3x) |
| **3** | 15/222 | Screw, back plate (2x) |
| **4** | 28/8/28 | Strain relief, service valve cable |
| **5** | 28/244/2 | Plug (small) |
| **6** | 72369 | Back plate |
| **7** | 2100/206 | Drive shaft |
| **8** | 15/222 | Screw, drive motor assy (2x) |
| **9** | 28/245/4 | Cable clamp |
| **10** | 72261 | Drive motor |
| **11** | 568/227/2 | Worm |
| **12** | 19/48 | Retaining ring |
| **13** | 70965 | Switch cam |
| **14** | 568/386 | Bracket, micro switches |
| **15** | 568/310 | Gear, switch cam |
| **16** | 15/184/7 | Locking screw, switch cam |
| **17** | 15/173/12 | Screw, micro switches (2x) |
| **18** | 72501 | Micro switch assy with socket, slave |
| **19** | 72305 | Timer cover |

# Valve body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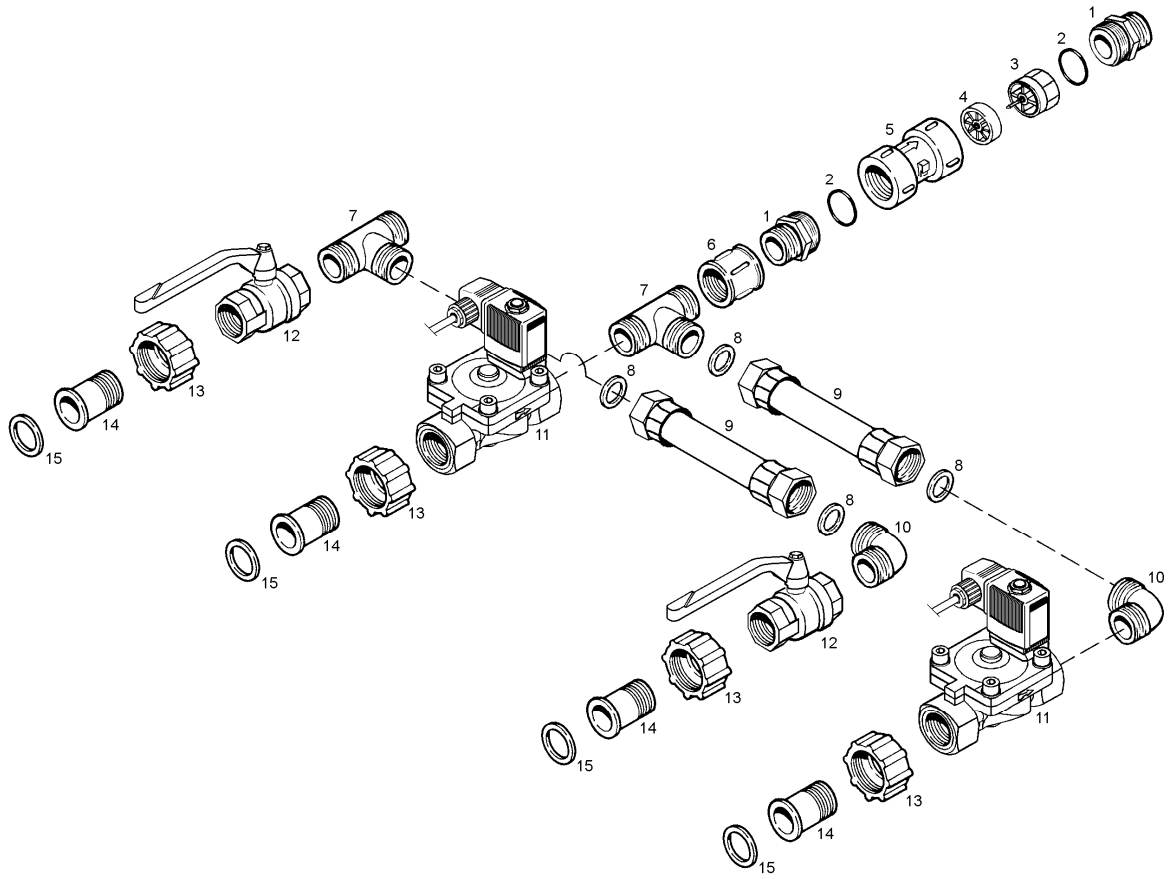
| ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|
| **1** | 21/83 | Drain connection |
| **2** | 568/271/* | Backwash flow control |
| **3** | 72678 | Bolt, valve cover (6x) |
| **4** | 568/254/3 | Valve cover |
| **5** | 185/154/1 | O-ring, valve cover |
| **6** | 186/112 | O-ring, Teflon |
| **7** | 72327 | Washer, PE |
| **8** | 568/260 | Worm gear |
| **9** | 568/259 | Rotor cam |
| **10** | 185/041/1 | O-ring, rotor |
| **11** | 568/345/2 | Rotor plate |
| **12** | 568/256 | Seal disk |
| **13** | 568/383 | Insert plate |
| **14** | 568/384 | Gasket |
| **15** | 413/62 | Spring, float valve |
| **16** | 568/270/4 | Float valve |
| **17** | 568/274/* | Injector |
| **18** | 185/007/6 | O-ring, mixing valve |
| **19** | 568/406 | Mixing valve |
| **20** | 186/118 | O-ring, sleeve |
| **21** | 568/407/L | Sleeve, mixing valve |
| **22** | 568/385/2/* | Brine refill flow control |
| **23** | 186/118 | O-ring, refill elbow |
| **24** | 568/336 | Refill elbow |
| **25** | 541/275 | Checkball, refill elbow |
| **26** | 413/62 | Spring, refill elbow |
| **27** | 21/88 | Nut, refill elbow/brine tee (3x) |
| **28** | 541/254 | Spring clip |
| **29** | 570/251 | Gasket, riser insert |
| **30** | 568/334 | Riser insert 1,050” |
| **31** | 185/214/1 | O-ring, riser tube |
| **32** | 185/337/1 | O-ring, tank |
| **33** | 541/232 | Adapter ring |
| **34** | 15/207/12 | Screw, adapter ring (2x) |
| **35** | 72772 | Packing gland nut (plastic) |
| **36** | 185/211/1 | O-ring, packing gland nut |
| **37** | 186/115 | O-ring, worm drive shaft (2x) |
| **38** | 568/208/2 | Worm drive shaft |
| **39** | 14/43 | Washer, worm drive shaft |
| **40** | EB64/33 | Brine refill tube |
| **41** | 568/340 | Brine tee |
| **42** | 185/208/1 | O-ring, brine tee |
| **43** | 26/47/12N | Checkball, brine tee |
| **44** | 72801 | Valve body |
| **A** | RK/568/259/2 | Repair kit rotor |
| **B** | RK/75154 | Repair kit packing gland nut |
| **C** | RK/568/406 | Repair kit mixing valve |

* Size: refer to “Sizing Table”

# Connection Kit




| ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|
| **1** | 74051 | Adapter, 1” male (2x) |
| **2** | 185/124/1 | O-ring, adapter (2x) |
| **3** | 72545 | Hub, impeller |
| **4** | 72544 | Impeller |
| **5** | 74054 | Flow meter housing |
| **6** | HS/MO4/4FF | Adapter, 1” female |
| **7** | 2002/T/4/4/M | T-piece, 1" male (2x) |
| **8** | 184/120 | Fibre gasket (4x) |
| **9** | FLEX4/4FF/05 | Flexible, 50 cm (2x) |
| **10** | HS/BO4/4MM | Elbow, 1" male (2x) |
| **11** | 74002 | Solenoid operated diaphragm valve (2x) |
| **12** | HS/BK4/4FF | Manual valve, 1" female (2x) |
| **13** | 568/232/2 | Union nut (4x) |
| **14** | 568/233 | Connection, 1” male (4x) |
| **15** | 3000/254 | Union gasket (4x) |

# Order Specifications

## 2401D/*VIBR*

***V*** = *Voltage*: **L** = transfo 230/24VAC, 35VA, EuroT plug
**R** = transfo 230/24VAC, 35VA, UK plug
**J** = no transfo

***I*** = *Injector*: **4, 1, 2, 5**

***B*** = *Backwash flow control*:

**0** = no flow control

| Nr. | Gal/min | (L/min) |
|---|---|---|
| **E** | 1,6 | (6,1) |
| **F** | 1,8 | (6,8) |
| **G** | 2,0 | (7,6) |
| **H** | 2,2 | (8,3) |
| **J** | 2,6 | (9,8) |
| **T** | 3,0 | (11,4) |
| **K** | 3,5 | (13,2) |
| **L** | 4,0 | (15,1) |
| **M** | 5,0 | (18,9) |
| **N** | 6,0 | (22,7) |
| **P** | 7,0 | (26,5) |
| **Q** | 8,0 | (30,3) |
| **R** | 9,0 | (34,1) |
| **S** | 10,0 | (37,9) |

***R*** = *Refill flow control*:

**0** = no flow control

| Nr. | Gal/min | (L/min) |
|---|---|---|
| **A** | 0,25 | (1,0) |
| **B** | 0,5 | (1,9) |
| **D** | 1,0 | (3,8) |