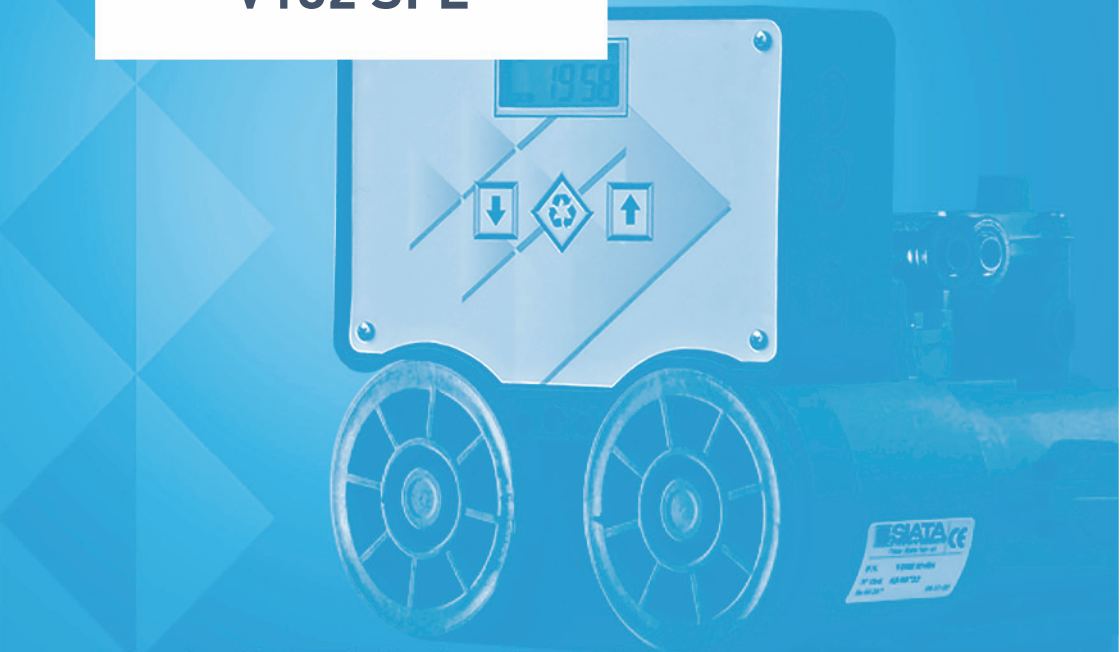
PENTAIR

# SIATA
# V132 SFE



# INSTALLER MANUAL

WATER PURIFICATION

# Table of contents

# 1. Generalities

## 1.1. Scope of the documentation

The documentation provides the necessary information for appropriate use of the product. It informs the user to ensure efficient execution of the installation, operation or maintenance procedures.
The content of this document is based on the information available at the time of publication. The original version of the document was written in English.
For safety and environmental protection reasons, the safety instructions given in this documentation must be strictly followed.
This manual is a reference and will not include every system installation situation. The person installing this equipment should have:

- Training in the Siata series, SFE controllers and water conditioner installation;
- Knowledge of water conditioning and how to determine proper controller settings;
- Basic plumbing skills.

This document is available in other languages on www.pentairaquaeurope.com/product-finder/product-type/control-valves.

## 1.2. Release management

| Revision | Date | Author | Description |
|---|---|---|---|
| A | 18.11.2016 | STF | First edition |
| | | | |
| | | | |
| | | | |
| | | | |

## 1.3. Manufacturer identifier, product

Manufacturer: Pentair Manufacturing Italy Srl
Via Masaccio, 13
56010 Lugnano di Vicopisano (PI) – Italy
Product: Siata V132 - SFE

## 1.4. Intended use

The device is intended for residential, commercial or light industry environment (ref. EN 50081-1) use only and it is purpose-built for treatment and softening of water coming from supply network.

## 1.5. Abbreviations used

DF ..... Down Flow
Inj ..... Injector
DLFC ..... Drain Line Flow Controller
BLFC / Refill Flow Controller ..... Brine Line Flow Controller
QC ..... Quick Connect
Regen ..... Regeneration
S&S ..... Seal & Spacer
SBV ..... Safety Brine Valve
TC ..... Time Clock

## 1.6. Norms

### 1.6.1. Applicable norms

Comply with the following guidelines:

- DM174: "Regulation of materials and objects that can be used in stationary collection, treatment, supply and distribution of water intended for human consumption"
- 2006/42/EC: Machinery Directive
- 2014/35/UE: Low Voltage Directive;
- 2014/30/UE: Electromagnetic compatibility;
- UNI EN ISO 9001 (Certificate no. 95.022 SSG ICS)

Meets the following technical standards:

- EN 61010-1
- EN 61000-6-1
- EN 61000-6-2
- EN 61000-6-3
- EN 61000-6-4
- EN 55014-1
- EN 55014-2

### 1.6.2. Available certificates

- CE
- DM174
- ACS

Access to all certifications:

## 1.7. Procedure for technical support

Procedure to follow for any technical support request:

**A** Collect the required information for a technical assistance request.
→ Product identification (see 2.2. Safety tags location, page 8 and 9.1. Recommendations, page 55);
→ Problem description of the device.

**B** Please refer to the "Troubleshooting" chapter, page 72. If the problem persists contact your supplier.

## 1.8. Copyright



## 1.9. Limitation of liability

Pentair Quality System EMEA products benefit, under specific conditions, from a manufacturer warranty that may be invoked by Pentair's direct customers. Users should contact the vendor of this product for applicable conditions and in case of a potential warranty claim.

Any warranty provided by Pentair regarding the product will become invalid in case of:

- Improper installation, improper programming, improper use, improper operation and/or maintenance leading to any kind of product damages;
- Improper or unauthorized intervention on the controller or components;
- Incorrect, improper or wrong connection/assembly of systems or products with this product and vice versa;
- Use of a non-compatible lubricant, grease or chemicals of any type and not listed by the manufacturer as compatible for the product;
- Failure due to wrong configuration and/or sizing.

Pentair accepts no liability for equipment installed by the user upstream or downstream of Pentair products, as well as for process/production processes which are installed and connected around or even related to the installation. Disturbances, failures, direct or indirect damages that are caused by such equipment or processes are also excluded from the warranty. Pentair shall not accept any liability for any loss or damage of profits, revenues, use, production, or contracts, or for any indirect, special or consequential loss or damage whatsoever. Please refer to the Pentair List Price to know more about terms and conditions applicable to this product.

# 2. Safety

## 2.1. Safety pictograms definition

**Caution**
Warns of a risk of minor injury or major material damage to the device or environment.

**Warning**
Warns against serious personal injury and damage to health.

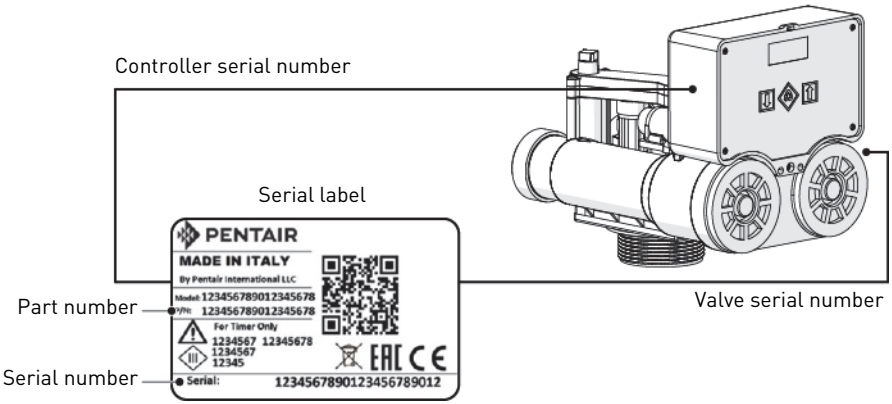
**Danger**
Warns against serious personal injury or death.

**Mandatory**
Standard or measure to apply.

**Note**
Comment

**Prohibition**
Restriction to be observed.

## 2.2. Safety tags location




**Note**
Ensure that the safety tags on the device are completely legible and clean. If necessary, replace them with new tags and put them in the same places.

## 2.3. Hazards

All the safety and protection instructions contained in this document must be observed in order to avoid temporary or permanent injury, damage to property or environmental pollution.

At the same time, any other legal regulations, accident prevention and environmental protection measures, as well as any recognized technical regulations relating to appropriate and risk-free methods of working which apply in the country and place of use of the device must be adhered to.

Any non-observation of the safety and protection rules, as well as any existing legal and technical regulations, will result in a risk of temporary or permanent injury, damage to property or environmental pollution.

### 2.3.1. Personnel

Only qualified and professional personnel, based on their training, experience and instruction as well as their knowledge of the regulations, the safety rules and operations performed, are authorized to carry out necessary work.

The device must not be used by children aged under 8 years old or people with reduced physical, sensory or mental capabilities.

People with a lack of experience or without the necessary knowledge should not use the device.

Do not allow children to play with the device. Cleaning and maintenance intended to be performed by the user must not be performed by unsupervised children.

### 2.3.2. Material

The following points must be observed to ensure proper operation of the system and the safety of users:

- Beware of high voltages present on the transformer (230V).
- Do not put your fingers in the system (risk of injuries with moving parts and shock due to electric voltage).

## 2.4. Hygiene and sanitization

### 2.4.1. Sanitary issues

**Preliminary checks and storage**

- Check the integrity of the packaging. Check that there is no damage and no signs of contact with liquid to make sure that no external contamination occurred.
- The packaging has a protective function and must be removed just before installation. For transportation and storage appropriate measures should be adopted to prevent the contamination of materials or objects themselves.

**Assembly**

- Assemble only with components which are in accordance with DM 174 and ACS.
- After installation and before use, perform one or more manual regenerations in order to clean the media bed. During such operations, do not use the water for human consumption. Perform a disinfection of the system in the case of installations for treatment of drinking water for human use.

**Note**
This operation must be repeated in the case of ordinary and extraordinary maintenance. It should also be repeated whenever the system remains idle for a significant time.

**Note**
Valid only for Italy: In case of equipment used in accordance with the DM25, apply all the signs and obligations arising from the DM25.

### 2.4.2. Hygiene measures

**Disinfection**

- The materials used for the construction of our products meet the standards for use with potable water; the manufacturing processes are also geared to preserving these criteria. However, the process of production, distribution, assembly and installation, may create conditions of bacterial proliferation, which may lead to odour problems and water contamination.
- It is therefore strongly recommended to sanitize the products. See 7.2. Sanitization, page 51.
- Maximum cleanliness is recommended during the assembly and installation.
- For disinfection, use Sodium or Calcium Hypochlorite and perform a manual regeneration.

# 3. Description

## 3.1. Valve versions

### 3.1.1. Twin pilots

The pressure distributor pilot is mounted directly on top of the V132, in this case inlet water is the control fluid and feeds the pilot circuit from the top collector. A controller with a proper camshaft (called twin pilot camshaft) must be mounted on top of the valve and linked to the pilot stems. The rotation of the camshaft moves the stems of the pilots in/out the pilot circuit, deviating the control water inside the proper side of the V132 pressure chambers to move the pistons of the valve according to the various cycles/phases.

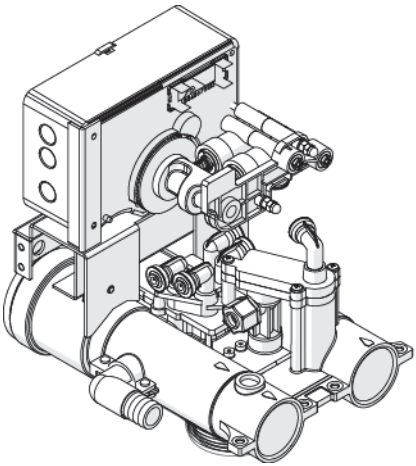
### 3.1.2. External connections

There are four quick connection ports on top of the valve, each port is linked to a pressure chamber inside the valve. The hydraulic distributor with pilots has to be mounted remotely from the valve, the pilot ports can be connected to valve ports with a diameter of 6 mm flexible tubing.

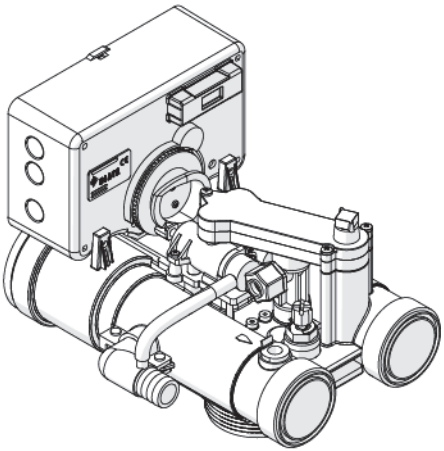
The remote camshaft can control up to 4 pilots hence more valves can be controlled with a single distributor. For this reason this configuration is generally used to:

- add outlet shut off pneumatic valve;
- add bypass during regeneration;
- control a valve in the suction line and make a timed brine draw.

External connections



Twin pilots



## 3.2. Technical specifications

**Design specifications/ratings**

Valve body ..... Glassfiber reinforced ABS
Rubber components ..... NBR
Valve material certification ..... DM174, ACS, KTW, W270
Weight (valve with controller) ..... 2.5 kg (max.)
Recommended operating pressure ..... 1.5 - 6 bar (22 - 87 psi)
Hydrostatic test pressure..... 22 bar (319 psi)
Water temperature..... 5 - 38°C (41 - 100.4°F)
Ambient temperature..... 5 - 38°C (41 - 100.4°F)
Maximum relative humidity..... 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40°C;

Indoor use only

**Flow rates (3.5 bar inlet - valve only)**

Continuous (Δp = 1 bar) ..... 7.0 $m^3$/h (30.8 gpm)
Cv*..... 8.09 gpm
Kv*..... 7 $m^3$/h
Maximum backwash (Δp = 1.8 bar) ..... 3.0 $m^3$/h (13.2 gpm)

*Cv : Flow rate in gpm across the valve at a pressure drop of 1 psi at 60°F.
*Kv : Flow rate in $m^3$/h across the valve at a pressure drop of 1 bar at 16°C.

**Valve connections**

Tank Thread..... 2 ½" 8 NPSM
Inlet/Outlet ..... Male 2" BSP or various QC fittings
Riser tube ..... 32 mm
Drain line ..... 20 mm
Brine line ..... ⅜"

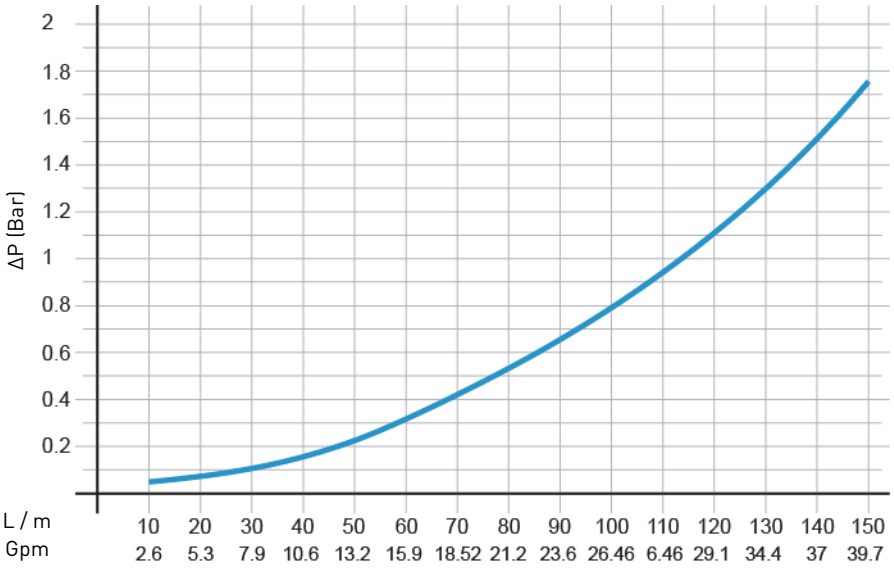
**Electrical**

Controller..... 12 VAC, 50/60 Hz, 4 W, Class III
Input supply frequency..... 50 or 60 Hz (controller configuration dependent)
Transformer*..... 230 VAC, 50/60 Hz, 11.5 VA, Class II
Motor input voltage..... 12 VAC
Protection rating..... IP 30

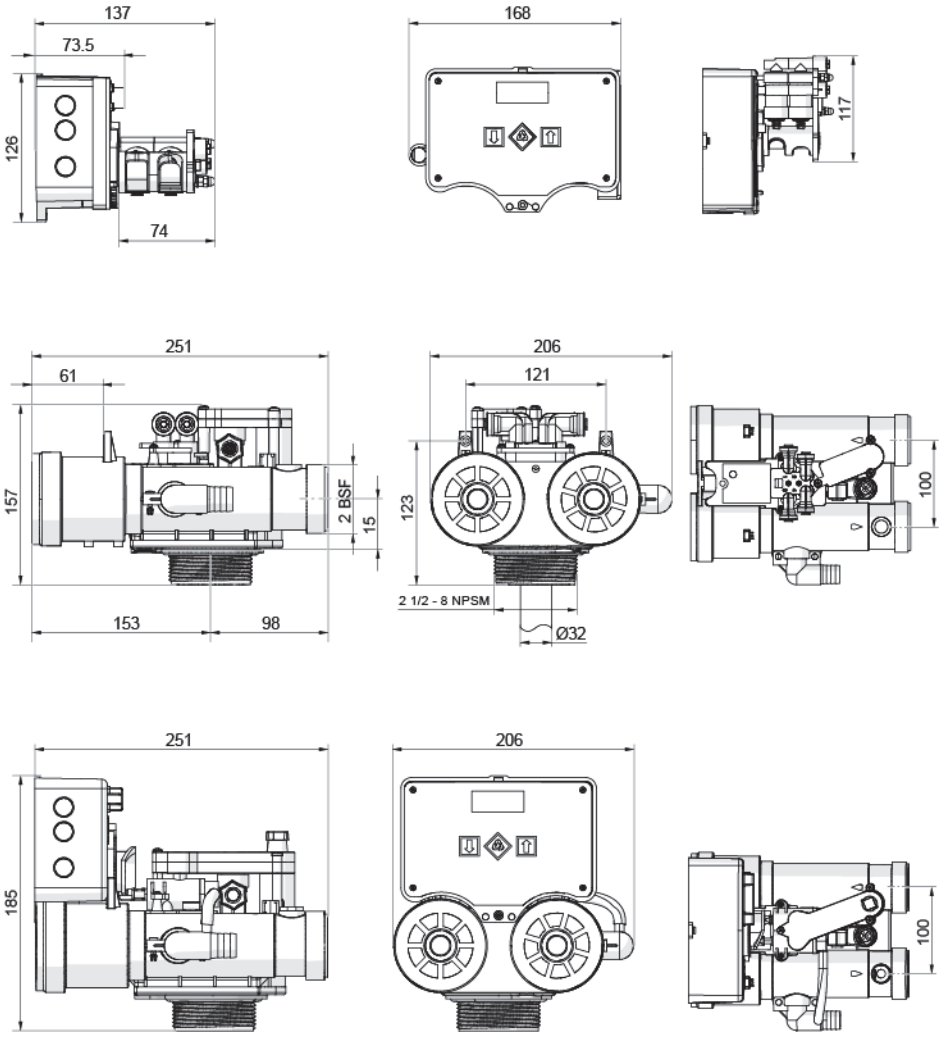
* : The device must only be used with the transformer provided in order to guarantee the safety voltage supply.

### 3.2.1. Performance flow rate characteristics

The graph shows the pressure drop created by the valve itself at different flow rates. It makes it possible to predetermine the maximum flow rate going through the valve depending on the system settings (inlet pressure etc). It also makes it possible to determine the valve pressure drop at a given flow rate, and therefore to evaluate the system pressure drop vs flow rate.



## 3.3. Outline drawing



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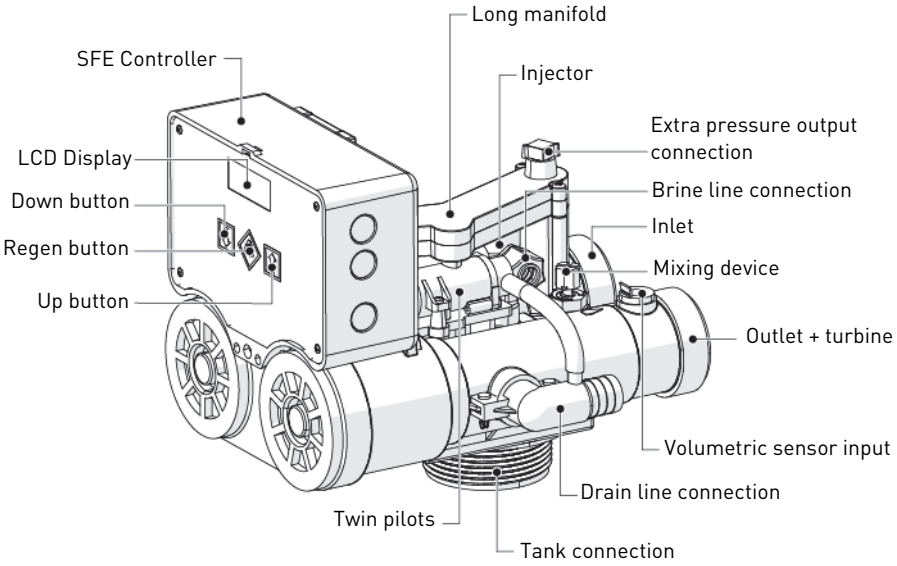
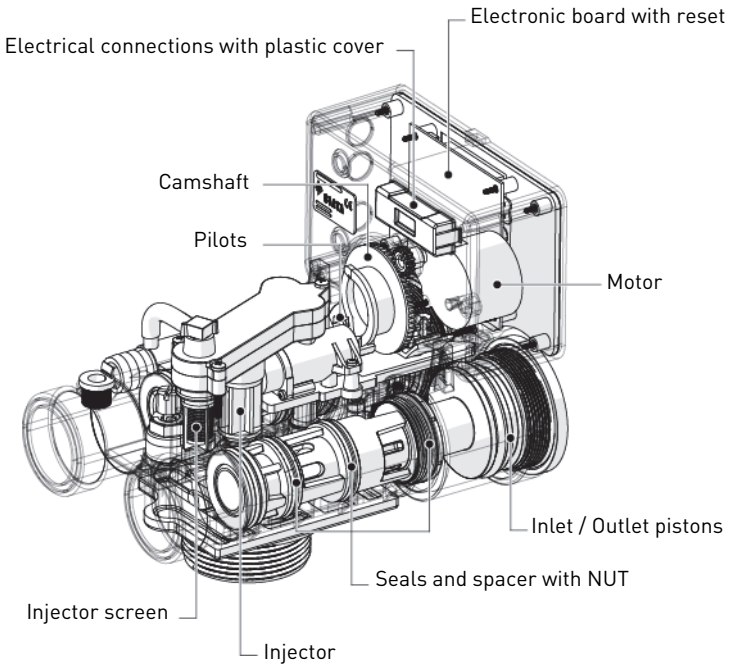
## 3.4. Description and components location

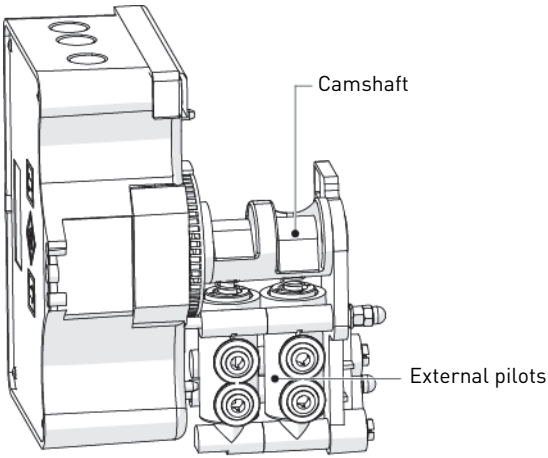
### 3.4.1. Valve with twin pilots

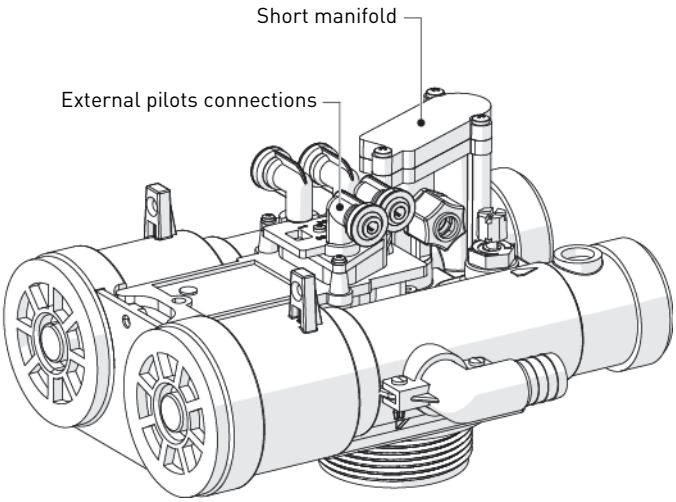


### 3.4.2. Valve with external pilots

**Note**
Only the components that differ from the twin pilots valve are described below.
Refer to chapter 3.4.1. Valve with twin pilots, page 16 for more information.



## 3.5. System regeneration cycle (4-cycle operation)

**Service — cycle C0**

Untreated water is directed down through the resin bed and up through the riser tube. The hardness ions attach themselves to the resin and are removed from the raw water being exchanged on the resin beads towards sodium ions. The water is conditioned as it passes through the resin bed.

**Backwash — cycle C1**

The flow of water is reversed by the controller valve and directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris is flushed to the drain, while the media bed is remixed.

**Brine draw— cycle C2**

The controller directs water through the brine injector and brine is drawn from the brine tank. The brine is then directed down through the resin bed and up through the riser tube to the drain. The hardness ions are displaced by sodium ions and are sent to the drain. The resin is regenerated during the brine cycle. Then the slow rinse phase starts.

**Slow rinse — cycle C3**

The slow rinse cycle allows the brine to be slowly pushed into the resin bed, enabling regeneration of the resin.

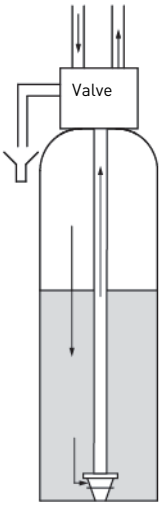
**Fast rinse — cycle C4**

The controller value directs water down through the resin bed and up through the riser tube to the drain. Any residual brine is rinsed from the resin bed, while the media bed is recompacted.

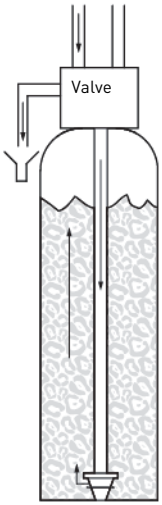
**Note**

After fast rinse cycle, water is directed to the brine tank to create brine for the next regeneration. But the brine refill cycle is not performed by the controller (this step is not included in the programmed cycles). See "Brine refill - cycle", page 30.

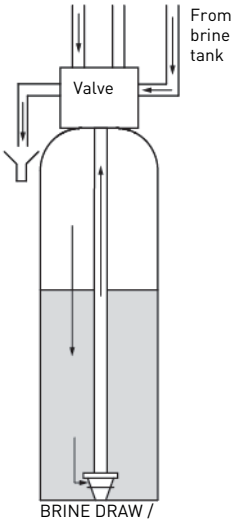
**Note**
For illustration purpose only. Always verify inlet and outlet marking on the valve.



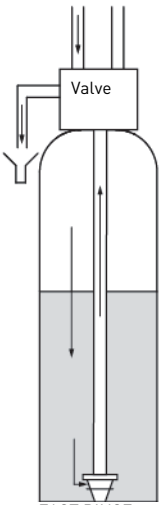

SERVICE
C0




BACKWASH
C1

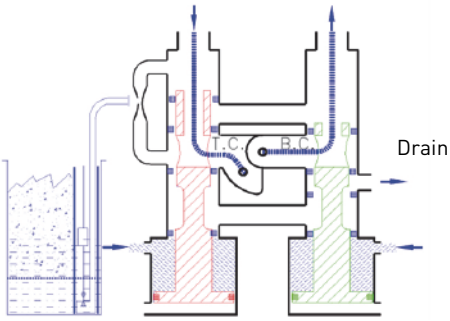



BRINE DRAW /
SLOW RINSE
C2 and C3

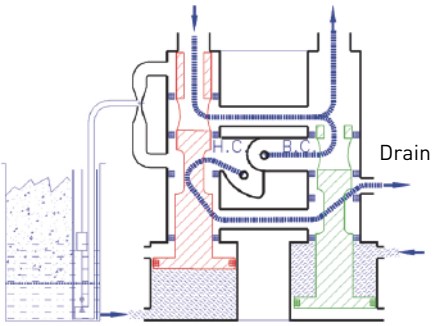



FAST RINSE
C4

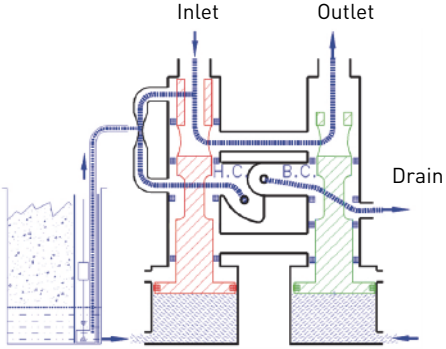
Service flow diagram



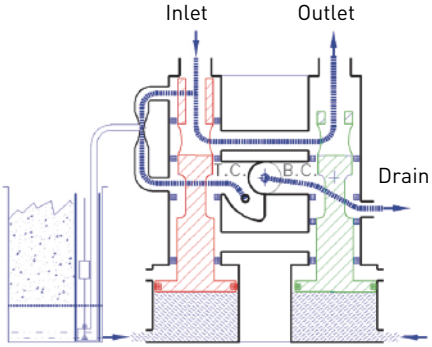

Backwash flow diagram



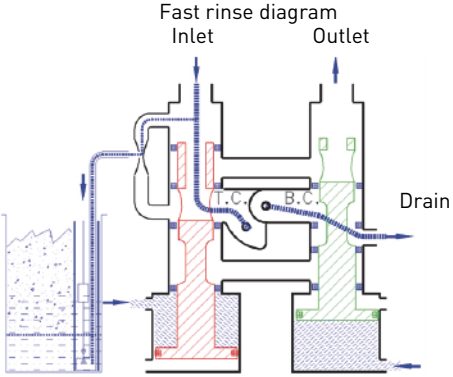

Brine draw diagram




Slow rinse diagram



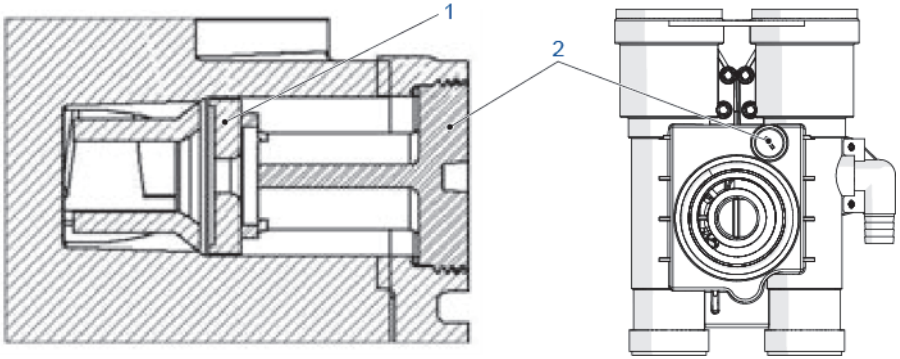

Fast rinse diagram



## 3.6. Options available on the valve

**Backwash flow regulators**

Backwash flow regulator (1) is positioned in the lower part of the valve. It is accessed by unscrewing protective cap (2).

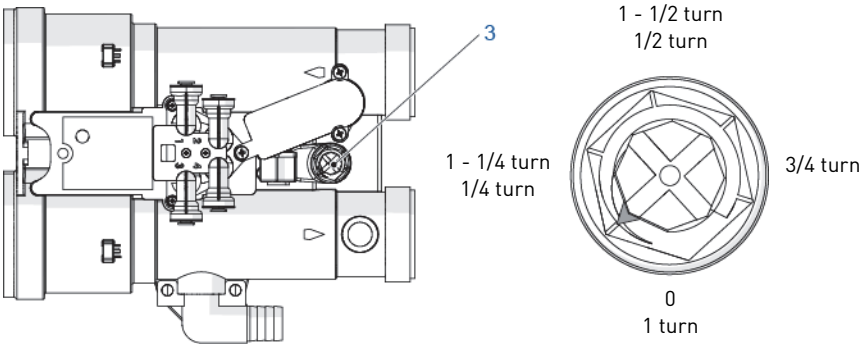



Valves equipped with this accessory are fitted with a flow control set offering the following maximum outputs:

| Code | Max output | | |
|---|---|---|---|
| | [gpm] | [L/min] | [L/h] |
| 12085 | 1.2 | 4.5 | 272.5 |
| 12086 | 1.5 | 5.7 | 340.6 |
| 12088 | 2.4 | 9.1 | 545.0 |
| 12090 | 3.5 | 13.2 | 794.8 |
| 12092 | 5 | 18.9 | 1135.5 |

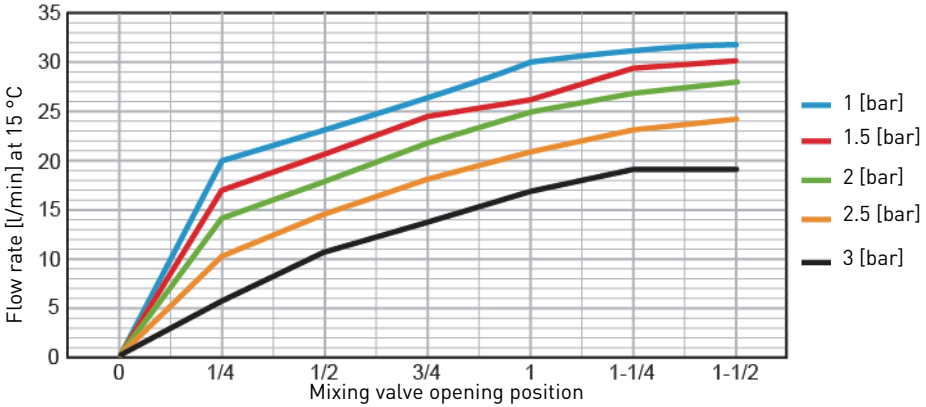
**Mixing device**

The valve can be equipped with a mixing device (3) whose function is to regulate the hardness of the water at the outlet.



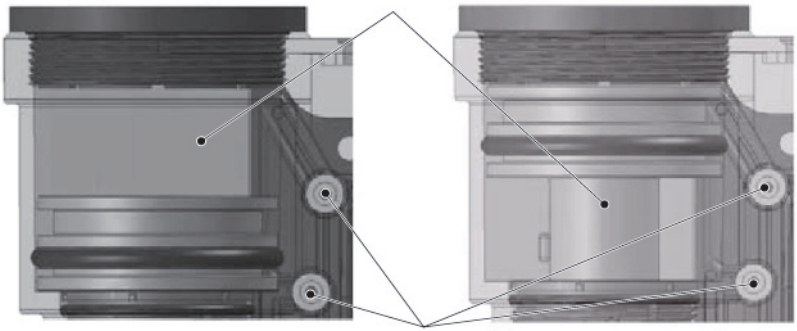
**Note**
There is no automatic bypass during a fast rinse cycle. But once the mixing device has been set, it connects the inlet and outlet of the valve.
So during the fast rinse phase with a mixing device, it is possible that a flow of untreated water flows into the outlet.

Mixing valve performance




**Additional hydraulic controls (driver replica)**
The valve can be equipped with two pairs of connectors for duplicating the position of the hydraulic controls. In order to use the valve, which is delivered with this option, simply remove the blue plugs, at the bottom of the valve, to put a 6 mm flexible tube into the quick connections.

Pilot chamber under pressure



# 4. System sizing

## 4.1. Recommendations

### 4.1.1. Injector/DLFC/BLFC-Valve configuration

| Tank diameter | Resin volume | Injector DF | DLFC | | |
|---|---|---|---|---|---|
| [in] | L | | No. Washers | [l/h] | [gpm] |
| 8 | 15 | Brown | 1 | 350 | 1.5 |
| 10 | 30 | Blue | 2 | 480 | 2.1 |
| 10 | 50 | Blue | 3 | 700 | 3.1 |
| 13 | 70 | Red | 4 | 950 | 4.2 |
| 14 | 100 | Red | 4 | 950 | 4.2 |
| 16 | 120 | Black | 5 | 1450 | 6.4 |
| 18 | 150 | Black | 5 | 1450 | 6.4 |

## 4.2. Sizing a softener (single unit)

### 4.2.1. Parameter to be considered

Whenever installing a softener, it is preferable to have full water analysis to ensure the inlet water content will not affect the resin bed.

**Note**
Please consult your resin manufacturer specifications to ensure that no additional pretreatment prior to softening is required.

The below sizing method can be applied for both residential and industrial softeners.
The sizing of a softener must be based upon certain parameters:

- Inlet water hardness;
- Peak flow rate and nominal flow rate;
- Service velocity;
- Salt dosage.

The softening and regeneration reactions are driven under certain conditions. To allow these reactions to take place, make sure that the velocity is convenient during the different phases for proper ion exchange. This velocity is given in the resin manufacturer specifications sheet.

Depending on the inlet water hardness, the service velocity for standard softening has to be between:

| Service velocity [bed volume per hour] | Inlet water hardness [mg/l as $CaCO_3$] | °F °TH | °dH |
|---|---|---|---|
| 8 - 40 | < 350 | <35 | <19.6 |
| 8 - 30 | 350 to 450 | 35 - 45 | 19.6 - 25.2 |
| 8 -20 | > 450 | >45 | >25.2 |

**Note**
Failure to respect the service velocity will lead to hardness leakage or even total softener inefficiency.

Note that the water supply piping size may also be useful when estimating the nominal flow rate, since the size of the piping allows a maximum flow rate to pass. Assuming the maximum velocity of water in pipes is about 3 m/s, a good estimation for most common pressure [3 bar] and temperature [16°C] is:

| Piping size (internal diameter) | | Max. flow rate |
|---|---|---|
| [in] | [mm] | [$m^3$/h at 3 m/s] |
| 0.5 | 12 | 1.22 |
| 0.75 | 20 | 3.39 |
| 1 | 26 | 5.73 |
| 1.25 | 32 | 8.69 |
| 1.5 | 40 | 13.57 |
| 2.0 | 50 | 21.20 |
| 2.5 | 63.5 | 35.2 |
| 3.0 | 76.2 | 49.2 |

### 4.2.2. Determining the required volume of resin

When sizing a softener, make sure that the volume of resin in the tank (bed volume) will be sufficient so that even when the peak flow rate is reached, the velocity is still between the above values depending on the hardness. When sizing a softener, always choose the resin volume and tank size based on the peak flow rate but not on the nominal flow rate.

**Note**
Sizing on the nominal flow rate without taking the peak flow rate into account would result in choosing smaller tank size and resin volume, and may lead in severe hardness leakage during the service cycle when the peak flow is reached.

The maximum softened water flow rate that can produce a softener is given by the following formula:

$Q_{service\ max} = Fs_{service} \times BV$

with:
$Q_{service\ max}$ : service flow rate [$m^3$/h]
$Fs_{service}$ : service velocity [BV/h]
BV : bed volume of resin [$m^3$]

Knowing this required volume of resin, it is possible now determine the tank you need. Note that at least a third of the total volume of the tank must de kept as free space so that the bed expansion during backwash is sufficient to ensure correct cleaning of the resin.

### 4.2.3. Resin exchange capacity and capacity of the unit

The resin exchange capacity and capacity of the unit are two different things and should not be confused. The resin exchange capacity is the amount of $Ca^{2+}$ and $Mg^{2+}$ that 1 liter of resin can retain, which will depend on the resin type and salt dosage, whereas the capacity of the unit is the capacity of the system which will depend on the volume of resin and resin exchange capacity.
Knowing the required volume of resin and the tank size, you can determine the exchange capacity of the unit. The capacity of the unit can be expressed in a different way:

- The mass capacity, which corresponds to the weight in equivalent $CaCO_3$ that can be fixed on the resin, expressed in kg as $CaCO_3$;
- The volume capacity, which represents the maximum amount of water that can be treated between 2 regenerations. This last capacity takes into account the hardness of the water to be treated and is expressed in $m^3$ or liters;
- The combined capacity, which represents the volume of water that can be treated between 2 regenerations if the inlet hardness is 1 °f or ° dH. This capacity is expressed in °f.$m^3$ or °dH.$m^3$.

The unit exchange capacity depends on the amount of salt to be injected in the resin bed during the regeneration. This amount of salt is given in grams per liter of resin. The 2 tables on the following pages show the resin exchange capacity based on the amount of salt for a system with standard efficiency regeneration and for a system with high efficiency regeneration.

Resin exchange capacity as a function of the salt dosage for standard efficiency:

| Salt amount [$g/L_{resin}$] | Corresponding resin exchange capacity in [$g/L_{resin}$] as $CaCO_3$ | $°F.m^3$ | $°d.m^3$ |
|---|---|---|---|
| 50 | 29.9 | 2.99 | 1.67 |
| 60 | 34 | 3.4 | 1.9 |
| 70 | 37.5 | 3.75 | 2.09 |
| 80 | 40.6 | 4.06 | 2.27 |
| 90 | 43.4 | 4.34 | 2.42 |
| 100 | 45.9 | 4.59 | 2.56 |
| 110 | 48.2 | 4.82 | 2.69 |
| 120 | 50.2 | 5.02 | 2.8 |
| 130 | 52.1 | 5.21 | 2.91 |
| 140 | 53.8 | 5.38 | 3.01 |
| 150 | 55.5 | 5.55 | 3.1 |
| 170 | 58.5 | 5.85 | 3.27 |
| 200 | 62.7 | 6.27 | 3.5 |
| 230 | 66.9 | 6.69 | 3.74 |
| 260 | 71 | 7.1 | 3.97 |
| 290 | 75.3 | 7.53 | 4.21 |

**To calculate the system mass capacity:**

$M_{capacity} = V_{resin} \times C_{resin\ ex}$

with:
$M_{capacity}$ : system mass capacity [g as $CaCO_3$]]
$V_{resin}$ : volume of resin [L]
$C_{resin\ ex}$ : resin exchange capacity [g/$L_{resin}$ as $CaCO_3$]

**To calculate the system combined capacity:**

$C_{capacity} = V_{resin} \times C_{cor\ resin\ exi}$

with:
$C_{capacity}$ : system combined capacity [°F.$m^3$ or °dH.$m^3$]
$V_{resin}$ : volume of resin [L]
$C_{cor\ resin\ ex}$ : corresponding resin exchange capacity [°F.$m^3$/L or °dH.$m^3$/L]

**To calculate the system volume capacity:**

$V_{capacity} = M_{capacity} / TH_{inlet}$

or

$V_{capacity} = C_{capacity} / TH_{inlet}$

with:
$V_{capacity}$ : system volume capacity [$m^3$]
$M_{capacity}$ : system mass capacity [kg as $CaCO_3$] or [°F.$m^3$ or °dH.$m^3$]
$C_{capacity}$ : system combined capacity [°F.$m^3$ or °dH.$m^3$]
$TH_{inlet}$ : inlet water hardness [mg/L as CaCO3] or [°F or °dH]

**Caution**
If $M_{capcacity}$ is in [kg] the value need to be multiplied by 1000.

**Note**
If a mixing device is set on the valve, the water hardness will be different.

Having determined the previous capacity allows the operator to know the service cycle duration.

### 4.2.4. Valve configuration

Knowing the volume of resin, tank size and specifications of the resin, it is possible to determine the required valve configuration. The resin specification will give the backwash velocity, as well as the brine draw and slow rinse velocity that must be respected in order to ensure a proper regeneration of the unit. From this data, determine the required backwash flow rate as well as the brine draw and service flow rate. In most cases, the fast rinse flow rate will be the same as the backwash flow rate, however for certain valve types the fast rinse flow rate will be the same as the service flow rate.

**To determine the backwash flow rate:**

$Q_{backwash} = Fs_{backwash} \times S$

with:
$Q_{backwash}$ : backwash flow rate [$m^3$/h]
$Fs_{backwash}$ : backwash velocity [m/h]
S : area [$m^2$]

The DLFC installed on the valve has to limit the backwash flow rate to the above calculated flow rate.

**To determine the injector size:**

The velocities to be respected for brine draw and slow rinse are given on the resin manufacturer specifications. Generally speaking, the injector has to allow a flow rate of about 4BV / h (corresponding to the flow rate of brine being drawn added to the flow rate of raw water passing through the injector nozzle to create the suction effect).

$Q_{Inj} = 4 \times BV / h$

with:
$Q_{inj}$ : total flow rate passing through the injector [L/h]
BV : bed volume of resin [L]

**Note**
This value does not correspond to the brine draw flow rate but to the total flow rate passing through the injector. Then refer to the injector diagrams for the chosen tank size and at the inlet pressure in order to check if the injector will give a correct flow rate. See "Injection flow rates (tables)", page 31.

### 4.2.5. Cycle time calculation

From this point, the volume of resin, the tank size and the capacity of the softener is determined. Next step is to calculate the regeneration cycle time, which depends on the valve configuration and once again on the resin specifications.

**Note**
Preprogrammed cycle times are only factory default programming that need to be adjusted to fit the system requirements).

For cycle time calculation the valve configuration must be known, which depends on:

- the tank size;
- the resin volume previously determined;
- the salt amount desired per regeneration;
- the resin specifications for the volume of water to use for backwashing the resin bed;
- the velocity and volume of water for brine draw and slow rinse;
- the volume of water to use for fast rinse.

**To calculate the backwash duration:**

$T_{backwash} = (V_{resin} \times N_{BV}) / Q_{backwash}$

with:
$T_{backwash}$ : backwash duration [min]
$V_{resin}$ : volume of resin [L]
$N_{BV}$: number of bed volume needed for backwash
$Q_{backwash}$ : backwash flow rate which is controlled by the DLFC [L/min]

**Note**
The typical value of the volume of water to be used for backwash is between 1.5 and 4 times the bed volume, depending on the inlet water quality.

**To calculate the brine draw duration:**
Knowing the injector flow rate at the working pressure:

$T_{brine\ draw} = V_{brine} / Q_{inj}$

with:
$T_{brine\ draw}$ : brine draw duration [min]
$V_{brine}$ : brine volume to be drawn [L]
$Q_{inj}$ : injection flow rate [L/min]

**Note**
Multiply the amount of salt in kg by 3 to get a correct approximation of the brine volume to draw.

**To calculate slow rinse duration:**

The volume of water to be used for slow rinse is given in the resin manufacturers specifications. Generally speaking, it is advised that between 2 and 4 BV of water is used to perform the slow rinse after brine draw. The slow rinse cycle allows brine to be pushed slowly through the resin bed, allowing the resin to be in contact with brine for sufficient time and therefore to be regenerated.

Refer to the injector curve at the common working pressure to determine the slow rinse duration.

$T_{slow\_rinse} = (N_{BV} \times BV) / Q_{SR}$

with:
$T_{slow\_rinse}$ : slow rinse duration [min]
$N_{BV}$: number of BV
BV: bed volume [L]
$Q_{SR}$: injector slow rinse flow rate [L/min]

**To calculate fast rinse duration:**

The fast rinse is aimed at eliminating an excess of salt in the resin bed and also recompacting the resin in the tank.

Depending on the valve type, the fast rinse flow rate is controlled by the DLFC or it has about the same flow rate as in service. The fast rinse velocity can be the same as the service velocity, and the volume of water to be used for the fast rinse is generally between 1 and 10 BV depending on the salt dosage.

$T_{fast\_rinse} = (N_{BV} \times BV) / Q_{DLFC}$

with:
$T_{fast\_rinse}$ : fast rinse duration [min]
$N_{BV}$: number of BV
BV: bed volume [L]
$Q_{DLFC}$: drain line flow [L/min]

### 4.2.6. Brine refill - cycle

After fast rinse cycle, water is directed to the brine tank at the rate of the safety brine valve to create brine for the next regeneration. But the brine refill cycle is not performed by the controller (this step is not included in the programmed cycles).

Example of configuration :

- Safety brine valve rate: 1l/min;
- With a 50L softening;
- With a salt setting of 150 g/L for regeneration.

Calculate the amount of water and salt required:
(150 x 100)/1000 = 15kg of salt;
15/0.375 = 40L of water.

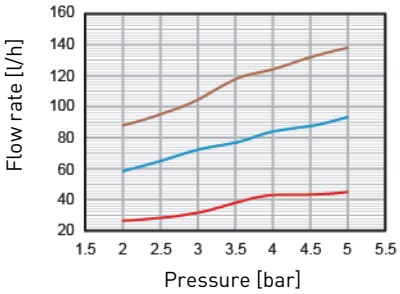
Fill the brine tank to the AC level.
Put 40 liters of water and at least 15 kg of salt in the brine tank.
Use a pencil to mark the level of mixed water and salt in the brine tank and set the floater to that level.
See “Block diagram and configuration example”, page 36.

**Note**
Please also refer to chapter “Start up procedure”, page 50 for additional information.

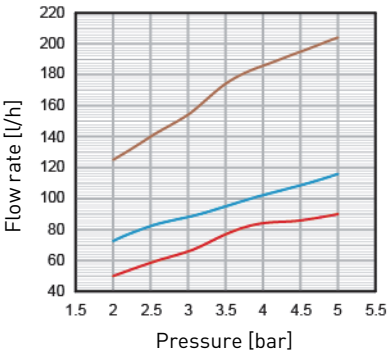
## 4.3. Injection flow rates (tables)

The following tables represent the injector flow rate as a function of the inlet pressure for the different injector sizes

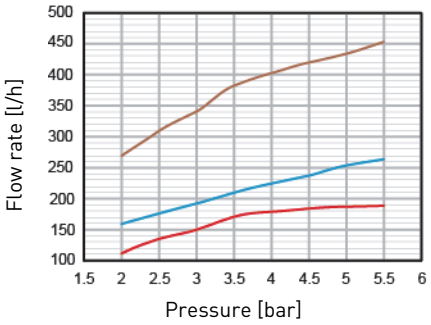
Brown ejector performance



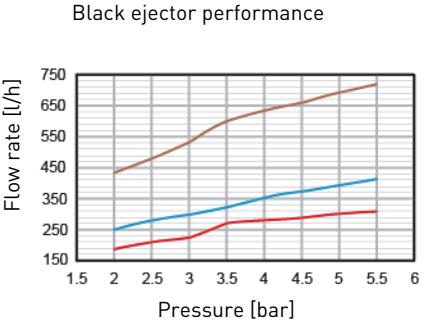

Blue ejector performance




Red ejector performance




Black ejector performance




Brine draw
Slow rinse
Regeneration

## 4.4. Salt amount definition

The salt settings are entered as part of the controller programming procedure.

# 5. Installation

**Caution**
It is strictly forbidden for non-qualified persons to access the system's internal components in order to perform any kind of technical operation.

## 5.1. Warnings

The manufacturer will not be held liable for any damage or injury to persons or property resulting from improper use of the device, or use not in line with the following instructions.
Should this guide leave any doubt concerning installation, service or maintenance, please contact the technical support of the company that installed the device.
Device installation must be done by a qualified technician according to the current standards and regulations, using tools approved for use with safety devices and the same technician must perform maintenance on the device.
In the event of breakdowns or malfunctions, before performing any kind of action on the device, make sure the transformer is disconnected from the power source, the water supply to the valve inlet shut off and the water pressure drained by opening a tap downstream of the valve.

## 5.2. Safety notices for installation

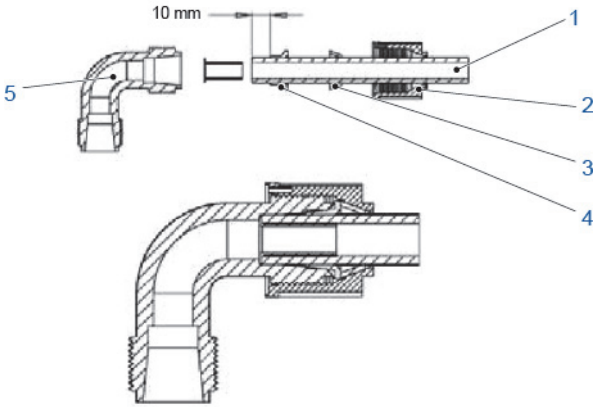
- Observe all warnings that appear in this manual;
- Only qualified and professional personnel are authorized to carry out installation work.

## 5.3. Installation environment

### 5.3.1. Tips and suggestions

**Connection of pipes and fittings**

Where 1/8" GAS rigid pipes or hoses are used in connections between pipes and fittings (diameter of approximately 9.7 mm), take care to respect the pipe dimensions. Pipes of a smaller diameter do not guarantee a pressure/vacuum seal. Pipes of a larger diameter, conversely, must be forced into their housing and this adversely affects the installation of retaining rings (3) and (4) resulting in a poor seal.
When working on fittings that are already installed, always replace retaining rings (3) and (4) 65-AC and 65-AA with equivalent new parts. When installing, ensure that the end of pipe (1) fully enters the housing of fitting (5) to ensure maximum grip. If a flexible tube is used, tighten pipe collar (2) thoroughly by hand. If a rigid pipe is used, tighten ring (2) using a wrench.

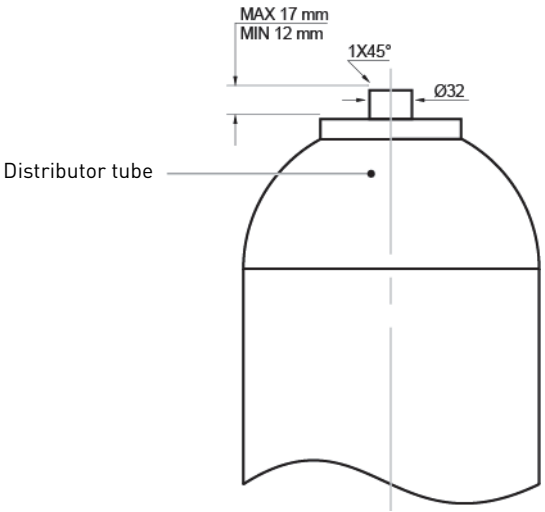



**Length of connection pipes between valve and lower distribution system**

The connection pipe must be cut between 12 to 17 mm, measured from the upper edge of the tank. Remove the sharp edges (1 mm x 45°) to avoid damage to the seal during installation. See drawing below.

**Note**

The connection pipe between the valve and the lower distribution system is ISO PN 6 standard : Minimum height 12 mm;
Maximum height 17 mm;
Chamfer 1 mm x 45°;
ISO PN6 pipe.



### 5.3.2. General

- Use only brine salts designed for water softening. Do not use ice melt salt, block, or rock salts;
- Keep the media tank in the upright position. Do not turn on its side, upside down, or drop. Turning the tank upside down may cause media to enter the valve or might plug the upper screen;
- Follow State and local codes for water testing. Do not use water that is micro-biologically unsafe or of unknown quality;
- When filling media tank, first place the control valve in backwash position, then do not open water valve completely. Fill tank slowly to prevent media from exiting the tank;
- When installing the water connection (bypass or manifold) connect to the plumbing system first. Allow heated parts to cool and cemented parts to set before installing any plastic parts. Do not get primer or solvent on O-rings, nuts, or the valve.

### 5.3.3. Water

- A minimum of 1.5 bar of water pressure is required for the regeneration valve to operate effectively. Do not exceed 6 bar; if this is the case, you should install a pressure regulator upstream of the system;
- The water temperature must not exceed 38 °C (100.4 °F);
- The unit must not be subjected to freezing conditions.

### 5.3.4. Electrical

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

- All electrical connections must be completed according to local codes;
- An uninterrupted current supply is required. Please make sure that your voltage supply is compatible with your unit before installation. If the electrical cable is damaged, it must be replaced by a qualified person;
- Only use the AC power adapter supplied;

**Mandatory**
The use of any other power adapter than the one supplied will void the warranty for all electronic parts of the valve.

- The power outlet must be grounded;
- To disconnect the power, unplug the AC adapter from its power source.

### 5.3.5. Mechanical

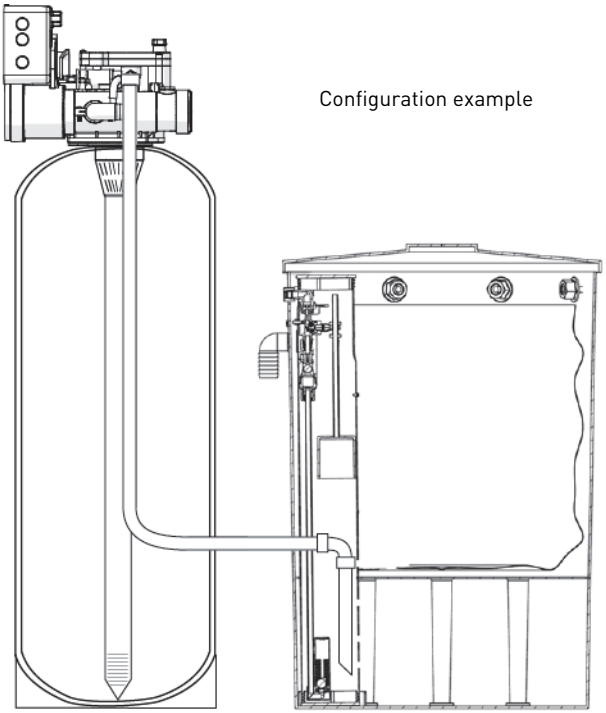
- Do not use PTFE (plumber's tape) lubricants such as vaseline, oils, or hydrocarbon-based lubricants. Use only 100% silicone lubricants;
- All plastic connections should be hand tightened. PTFE (plumber's tape) may be used on connections that do not use an O-ring seal. Do not use pliers or pipe wrenches;
- All plumbing must be completed according to local codes;
- Soldering near the drain line should be done before connecting the drain line to the valve. Excessive heat will cause interior damage to the valve;
- Observe the drain line requirements:
  Maximum 1 m (3 ft 3 in) high at 2 bars (29 psi) inlet pressure. Add 50 cm (1 ft 7 in) for each additional 1 bar (14.5 psi) inlet pressure;
- Do not use lead-based solder for sweat solder connections;
- The drain line must be a minimum of 12.7 mm (½") in diameter. Use 19 mm (¾") pipe if the backwash flow rate is greater than 26.5 lpm (5.83 gpm) or the pipe length is greater than 6 m (19 ft 8 in);
- Do not support the weight of the system on the control valve fittings, plumbing, or the bypass;
- It is not recommended to use sealants on the threads. Use PTFE (plumber's tape) on the threads of the 2" BSP or in any other threaded connection in the valve.

### 5.3.6. Integration constraints

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

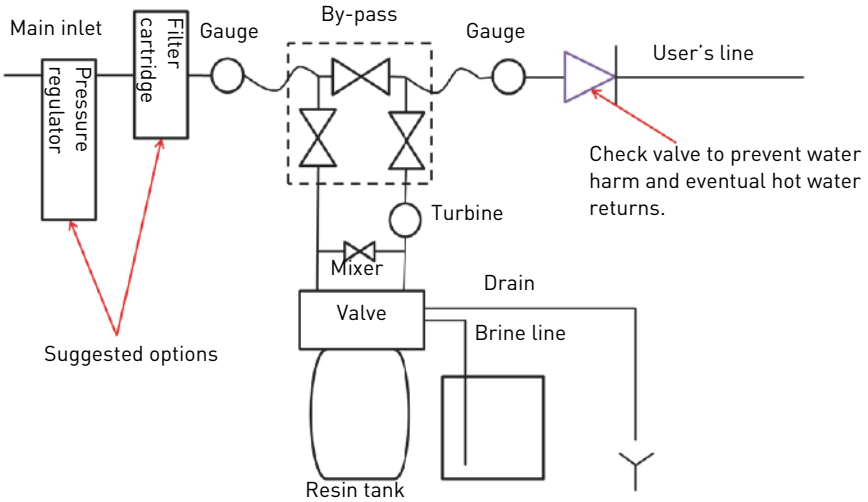
- Level platform or floor;
- Room to access equipment for maintenance and adding brine (salt) to tank;
- Total minimum pipe run to water heater of 3 m (10 ft) to prevent backup of hot water into system;
- Always install a check valve to protect the softener from hot water return;
- Local drain for discharge as close as possible;
- Water line connections with shut off or bypass valves;
- Must meet any local and state codes for the installation site;
- The valve is designed for minor plumbing misalignments. Do not support the weight of the system on the plumbing;
- Make sure all soldered pipes are fully cooled before attaching plastic valves to the plumbing;
- The existing plumbing should be in a good condition and free from limescale. If in doubt, replace it. The installation of a pre-filter is always advised.

## 5.4. Block diagram and configuration example



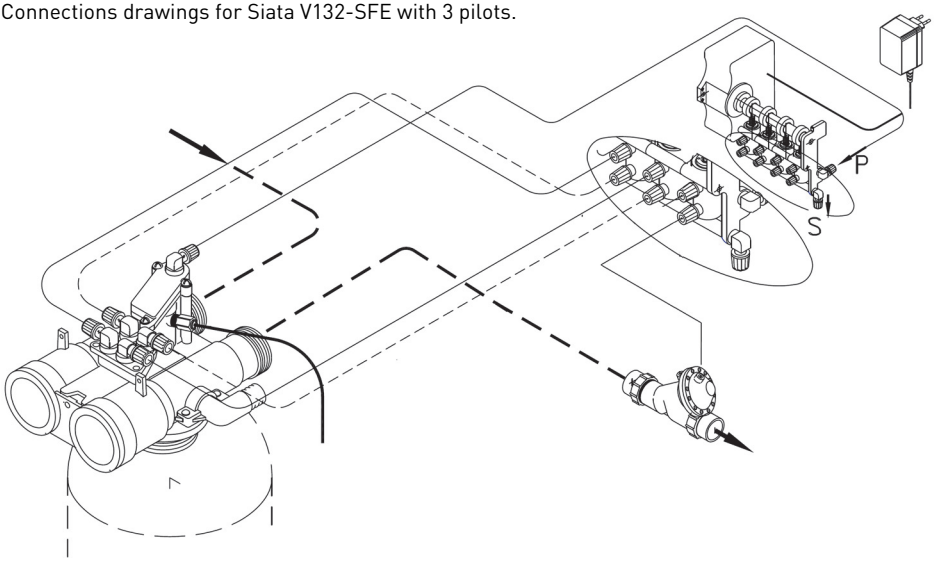
Configuration example

Block diagram

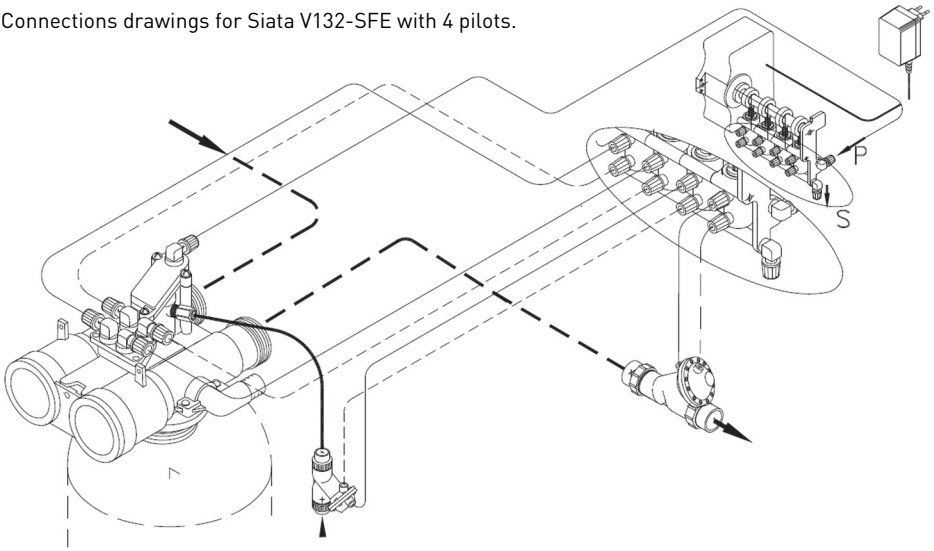


## 5.5. Diagrams of softening systems and connections

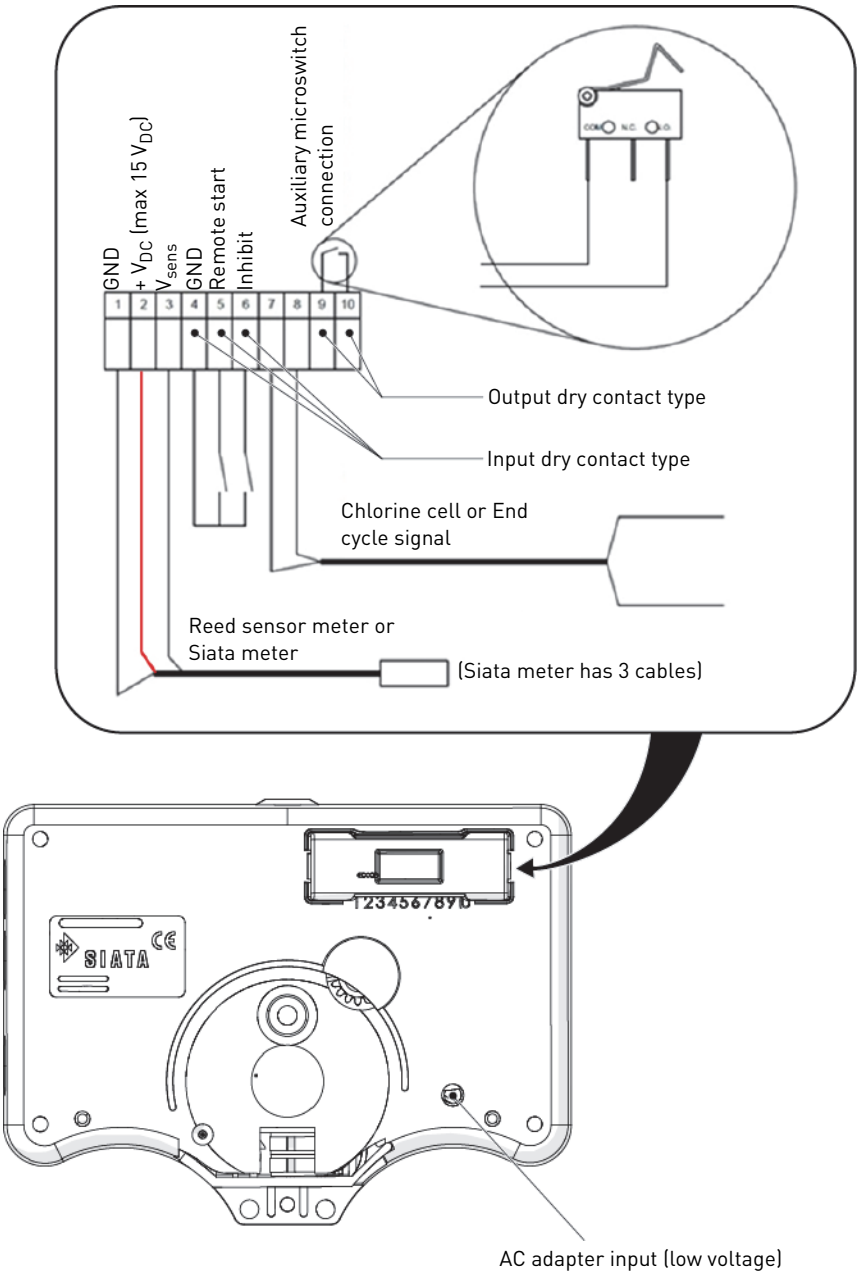
Connections drawings for Siata V132-SFE with 3 pilots.




Connections drawings for Siata V132-SFE with 4 pilots.



## 5.6. Connections (electrical)



## 5.7. Bypassing

A bypass valve system has to be installed on all water conditioning systems. Bypass valves isolate the conditioner from the water system and allow unconditioned water to be used. Service or routine maintenance procedures may also require the system to be bypassed.

**Caution**
Do not solder pipes with lead-based solder.

**Caution**
Do not use tools to tighten plastic fittings. Over time, stress may break the connections.

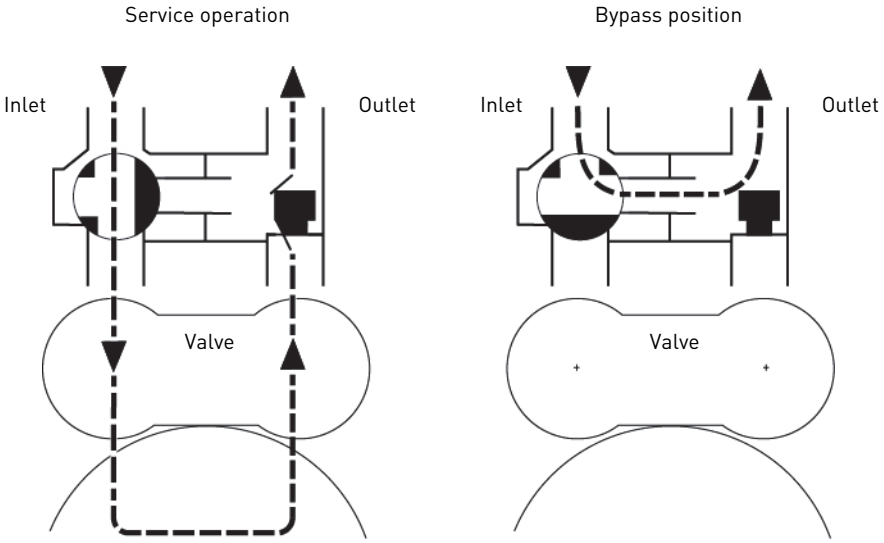
**Caution**
Do not use petroleum grease on gaskets when connecting bypass plumbing. Use only 100% silicone grease products when installing any plastic valves. Non-silicone grease may cause plastic components to fail over time.

**Note**
Always provide a bypass valve for the installation, if the unit is not equipped with one.

**Note**
Depending on the system configuration, several types of bypass are possible.

### 5.7.1. Manual Bypass

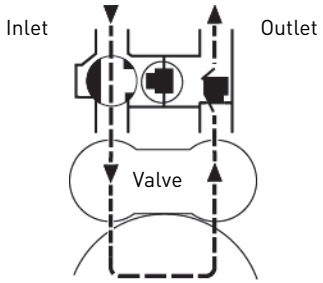
The manual bypass is used simply to disconnect valve or the entire water treatment system without causing a break in the supply of water. During service it provides a perfect seal between inlet and outlet to prevent mixing between raw water and treated water.



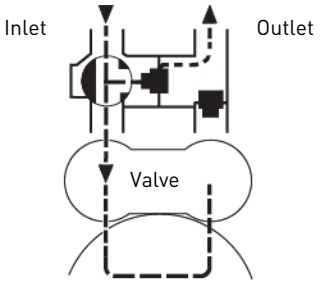
### 5.7.2. Automatic Bypass

The automatic proportional bypass accessory enhances the system with following functions when fitted upstream of the water treatment system:

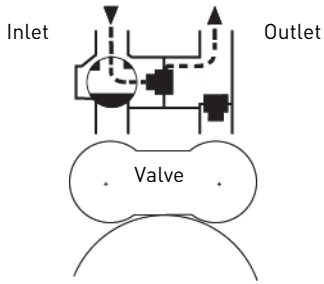
- Supply of untreated water during regeneration cycle 4C. In this cycle the valve does not provide hard water bypass during the regeneration.
- If there is a temporary increase of the water consumption the pressure drop inside the valve and through the resin bed increases substantially. In this situation, due to the differential pressure that has been created from inlet and outlet sides of the bypass, the automatic bypass valve opens to balance the outlet pressure with the inlet pressure ensuring a higher flow rate at the outlet. But of course in that case an intermediate hardness is obtained during part of the service cycle.
- Disconnection of the valve or the entire water treatment system without causing a break in the supply of water. In that case only raw water is available for the user.



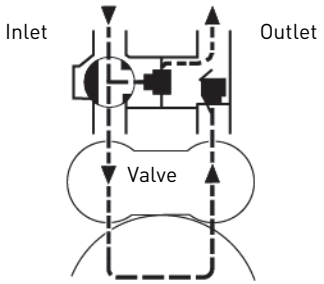

Service operation




Regeneration. Automatic valve open for raw water bypass




Bypass position




Service operation with high pressure drop (automatic valve open)

## 5.8. Drain line connection

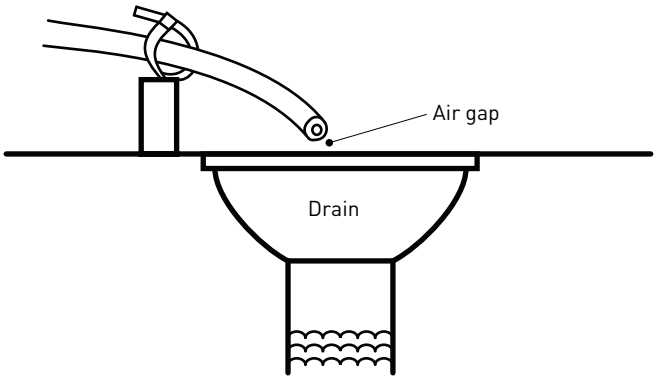
**Note**
Standard commercial practices are expressed here. Local codes may require changes to the following suggestions. Check with local authorities before installing a system.

The unit should be above and not more than 6.1 m (20 ft) from the drain. Use a 22 mm hose tube.
The drain line may be elevated up to 1.8 m (6 ft) providing the run does not exceed 4.6 m (15 ft) and water pressure at the conditioner is not less than 2.76 bar (40 psi). Elevation can increase by 61 cm (2 ft) for each additional 0.69 bar (10 psi) of water pressure at the drain connector.
Where the drain line is elevated but empties into a drain below the level of the controller valve, form a 18 cm (7") loop at the far end of the line so that the bottom of the loop is level with the drain line connection. This will provide an adequate siphon trap.

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

**Note**
Waste connections or the drain outlet shall be designed and constructed to provide connection to the sanitary waste system through an air-gap of 2 pipe diameters or 25.4 mm (1"), whichever is larger.

**Caution**
Never insert the drain line directly into a drain, sewer line or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.



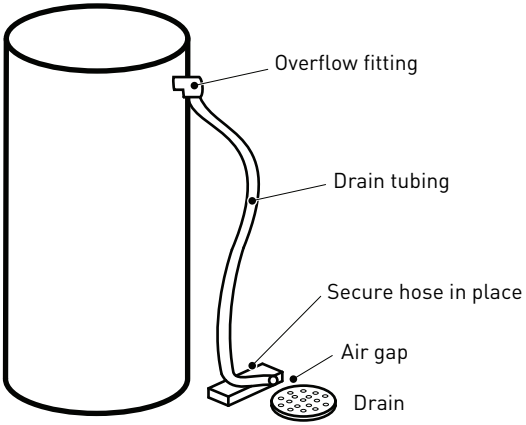
## 5.9. Overflow line connection

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

To connect the overflow line, locate the hole on side of tank. Insert overflow fitting into tank and tighten with plastic thumb nut and gasket as shown below. Attach a length of 12.7 mm (1/2") I.D. tubing (not supplied) to fitting and run to drain.

Do not elevate overflow higher than overflow fitting.

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




## 5.10. Brine line connection

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

## 5.11. Chlorinator

The chlorinator is able to carry out automatic sterilisation of the resin during regeneration. To perform this function, the valve must naturally be equipped with a controller able to manage the SIATA range of chlorinators. The controller supplies power to the electrolytic cell during the regeneration cycle to produce an appropriate quantity of chlorine by electrolysis of the brine, which is necessary for the sterilisation of the resins.

# 6. Programming

## 6.1. General information

- In battery-operated mode, regeneration is not carried out and the parameters cannot be edited;
- The SFE controller allows you to manage your installation via clock control or volumetric control. The controller will automatically initiate regenerations cycles based upon the programmed regeneration mode and the programmed parameters;
- The SFE controller offers the possibility to manually start regeneration simply by pressing the regeneration button, as well as initiate a regeneration from an external signal;
- The controller is able to receive an external signal for inhibition of regeneration cycles, that will block any regeneration start as long as the inhibit signal is received by the controller;
- The SFE controller can manage a chlorine production cell that will be activated during the brine draw cycle of the regeneration.

**Note**
The SFE controller is available with 2 different electronic boards:
- Standard 7930-23 : this board allows to program a dry contact relay.
- Chlorine cell control 7930-24 : this board allows to drive a chlorine producer.
Both electronic boards are delivered with the same software.

## 6.2. Basic programming

**Note**
To access the basic menu, press and release the ◈ button.

**Note**
Menus are displayed in a defined and incremental order.

**Note**
While the parameters are being edited, the regeneration icon is on and flashing.

**Hour format setting**
Set your format settings as 12 or 24 hours.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.


**Current time**
Set the current time displayed.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Day of week**


Set the current day of the week.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Days enabled for regeneration**


Set the days enabled for regeneration. The display shows "dx y" where "x" is the day of the week (1 - 7) and "y" shows whether the selected day is enabled for regeneration "1" or not "0".

For each enabled day, the top of the display shows the relevant flashing icon.

**A** Use ⬆ to edit the setting of the selected day "x".

**B** Use ⬇ to enable or disable the selected day "y".

**C** Press ◈ to validate and switch to the next parameters.

**Regeneration time**


Set the regeneration time. Regeneration will start when a delayed time or cubic meter start is enabled.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate.
"End" is displayed on the screen. Programming is now complete.

## 6.3. Advanced programming

**Note**
Press ⬇ and ⬆ hold for 5 seconds to access advanced programming.

The SFE controller features an advanced programming level that allows the installing dealer to make changes to the controller for more demanding applications. The homeowner/end user should never have to access this level.

**Regeneration start mode**


Set the regeneration start mode :

- SH:00 - Regeneration start at the time set on the enabled days.
- SH:01 - Regeneration start at the time set after the volume treatment on the enabled days.
- SH:02 - Immediate start at the end of the volume treatment on the enabled days.
- SH:03 - Start at intervals. Regeneration starts every 1, 2, 3, 4, 8 or 12 hours. Regeneration starts when the hour strikes, so if regeneration is enabled every two hours, it will be carried out at 0:00, 2:00, 4:00 and so on.

**Note**
The first regeneration is carried out at the time set in the basic menu. This function is available on the enabled days.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Interval time between regenerations**

Set the interval time (hours) between regenerations.


**Note**

This parameter is displayed after the regeneration start mode only if an interval start has been selected (SH:03).

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Volumetric meter K factor**

Set the volumetric meter K factor. The parameter is composed of the integer part and of the decimal part, separated by the decimal point. Set this parameter to 14.0 for Siata V132.


**Note**

This parameter is displayed after the regeneration start mode only if a volume start has been selected (SH:01 or SH:02).

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Volume to be treated before starting regeneration**

Set the volume (liters) to be treated before starting the regeneration. Thousands and hundreds are modified first; once they are correctly set, press ◈ to switch to the tenths and units setting.


**Note**

This parameter is displayed after the regeneration start mode only if a volume start has been selected (SH:01 or SH:02).

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

The following formula is used to calculate the volume of treatable water (in liters) between two subsequent regenerations:

$V_{treatable\ water}$ = [(L.xxx) x (C.xx) x 1000] / [(d.xxx) - (do.xx)]

where :

- d.xxx : incoming water hardness, in French degrees [°f] or [ppm];
- do.xx: desired outgoing water hardness, in French degrees [°f];
- C:xx: exchange capacity of the regenerating resin used, expressed in [°f x $m^3$/L] or in [g/$L_{resin}$] of $CaCO_3$;
- L.xxx: volume of resin, expressed in liters [L].

The result must be typed, rounded down to the closest integer.

**Note**
The desired outgoing water hardness value must be compatible with the provisions of the regulations in force where the controller is used.

**Duration of the first regeneration cycle stop**


Set the duration of the first regeneration cycle stop (minutes). If the parameter is set to off, the stop will be skipped and the system will go directly to the next stop.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Duration of the second regeneration cycle stop**


Set the duration of the second regeneration cycle stop (minutes). If the parameter is set to off, the stop will be skipped and the system will go directly to the next stop.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Duration of the third regeneration cycle stop**


Set the duration of the third regeneration cycle stop (minutes). If the parameter is set to off, the stop will be skipped and the system will go directly to the next stop.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Duration of the fourth regeneration cycle stop**


Set the duration of the fourth regeneration cycle stop (minutes). If the parameter is set to off, the stop will be skipped and the system will go directly to the next stop.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Number of regenerations before a salt alarm is generated**


Set the number of regenerations before a salt alarm is generated.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

The following formula is used to calculate the number of regenerations before a salt alarm is generated :

SA = [(M.xxx) x 1000] / [(L.xxx) x (G.xx)]

where :

- M.xxx: amount of salt found in the brine tank [kg];
- L.xxx: volume of resin [l];
- G.xxx: amount of salt required to regenerate 1 liter of resin [g/l].

The result must be typed, rounded down to the closest integer.

**Days of interval for the mandatory regeneration**


Set the number of days of interval for the mandatory regeneration. If this parameter is set to Off, the function is disabled.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Note**
Regeneration will take place at the regeneration time even if the day is disabled.

**Frequency**


Set the frequency of the mains to 50 or 60 Hz.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Duration of the cycle end pulse**


Set the duration of the cycle end pulse.

**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Note**
This functionality only works if the controller has cycle end pulse.

**Chlorine driver activated**

Set the chlorine driver on or off.


**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate and switch to the next parameters.

**Note**
This functionality only works if the controller has chlorine driver.

**Volume restored / not restored**

Set to determine whether the volume is restored (UlMM) or not restored (UdlF). The volume remaining will be kept in memory or restored to the programmed value, after exiting the programming (SH:01 or SH:02).


**A** Use ⬇ and ⬆ to edit this parameter.

**B** Press ◈ to validate.
"End" is displayed on the screen. Programming is now complete.

**C**

### 6.3.1. Statistics

The statistics menu displays some of the module's historical data.. To access to this menu, press and hold ⬆ for 5 seconds.

| Data | Description |
|---|---|
| Xxxx | Number of regenerations carried out. |
| SAxx | Number of residual regenerations before the salt alarm is generated. |
| FFxx | Number of days elapsed since the last regeneration. |
| Lxxxxxx | Overall volume treated [l]. |
| Xx:xx | Day and time of the last regeneration carried out, the regeneration icon is on. |
| Xx:xx | Day and time of the second last regeneration carried out, the service icon is on. |
| Xx:xx | Day and time of the third last regeneration carried out, the service and regeneration icons are on simultaneously. |
| End | End of the statistics. |
| 189x | Software release and revision. |

- The treated volume is displayed on a running string to allow a number greater than 9999 to be read;
- Use ◈ to switch to the next parameters in the statistics menu;
- The date and time information for the last regenerations is only available if they have been carried out;
- While the statistics are displayed, the regeneration icon is on, if not otherwise indicated;

### 6.3.2. Resetting the EEPROM

To reset the EEPROM to the default values, the controller must be in the service condition (no regeneration cycle running and clock displayed).

**A** Open the Statistics menu.
→ See 6.3.1. Statistics, page 48.

**B** Press and release ⬇.

**C** Press and release ⬆.

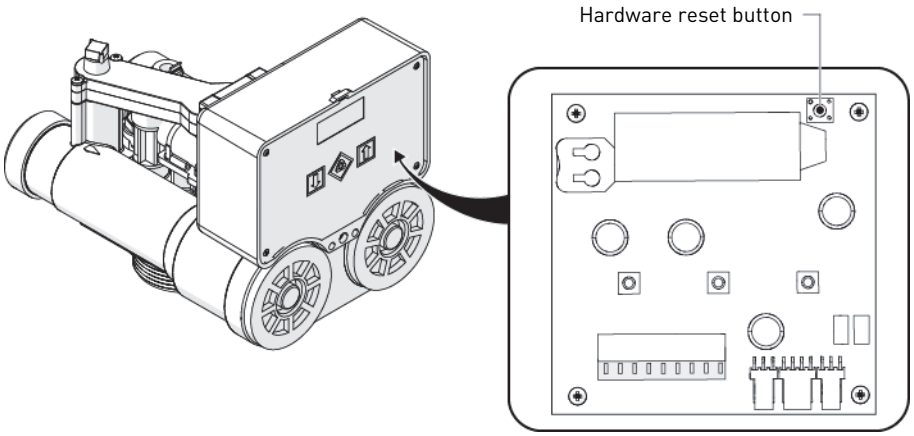
**D** Press and release ⬇.

**E** Press and hold ⬆ for 5 seconds.
→ The display shows "rSt" for a few seconds. The EEPROM has been reset.

**Note**
This procedure does not reset the statistical data.

### 6.3.3. Resetting the hardware

The SFE controller is fitted with a hardware reset button located on the board itself close to the display and not directly accessible by the user.
After a hardware reset, the time on the display flashes until any button is pressed.



# 7. Commissioning

## 7.1. Start up procedure

1. With the bypass still in bypass position (inlet and outlet manual valve closed), plug in the SFE controller to the power source.
2. If not done yet proceed to programming according to the system specification. See "Programming", page 43.
3. Start a manual regeneration by pressing ◈ for 5 seconds (see "Manual regeneration", page 54). The controller is going to move in backwash position (C1). Once in this position, unplug the SFE controller from the power source.
4. Make sure the brine line is connected to the safety brine valve. Set the floater of the brine valve to the lowest level possible and make sure the brine tank is yet not filled with salt.
5. With the outlet manual valve still closed, slowly open the inlet manual valve. The system is going to pressurize and the V132 pistons is moving effectively in backwash position. The valve and tank is going to slowly get filled with raw water, allowing air to be purged out by the drain. Open the inlet valve progressively until fully open position. Because of the particular design of the V132, during this cycle the brine tank is going to be refilled as well. As soon as the brine valve floater level is reached and the floater lifted by the water, the refill of the brine tank should stop. Check that the floater tightly close the brine line to ensure the safety brine valve is working properly. Mark with a pen the level that the water reached on the floater.
6. As soon as the drain runs clear, plug in again the SFE controller to the power source.
7. Press on ◈ once to move the valve pistons to the next regeneration cycle position (brine draw (C2)). Check if the draw is performed and let the water in the brine tank decrease to the air check level.
8. Press on ◈ to move to slow rinse cycle (C3), this is not creating changes in the pistons position. Place the brine valve float to the highest possible position to allow proper refill during the next cycle.
9. The Siata brine valve BR1-100 is equipped with a brine line flow control (BLFC) which set the refill flow rate at 1 L/min. Knowing it, determine the refill time to get the brine tank filled with the required amount of water to prepare the brine according to your system settings :
   $T_{refill} = V_{brine} / Q_{BLFC}$

   In case your softener is equipped with a non Siata safety brine valve, and the BLFC size is unknown / BLFC is not present, close the inlet manual valve and fill brine tank with the amount of water needed using buckets filled with a known amount of water. Mark the level then skip step #10 and move to step #11.
10. Press on ◈ to move the valve pistons to the next regeneration cycle position (fast rinse (C4)). As soon as the flow at the drain increases, the valve is going to also start the refill of the brine tank.

    Start to time with your wrist-lock from this moment. As soon as cycle C4 is reached press on ◈ to move the valve back in service position, this operation is not going to stop the refill of the brine tank. Once the time for refill, calculated in step #9, is passed by, close the inlet manual valve to stop the refill.

11. Fill the brine tank with salt. It is possible to mark the level of water in the brine tank when it is completely refilled with water and full of salt. In the future, after each regeneration, you can visually control that the quantity of water refilled should be between the 2 marks done. Marking are optional, but may allow to visually detect an irregularity during regeneration that may lead to softener inefficiency.
12. With the brine tank completely refilled and full of salt, adjust the safety brine float in the brine well to the water level, use the mark done on step #5 as a reference. Make sure the overflow elbow is installed above the float level.
13. Open the inlet manual valve and check there is no refill anymore and the safety brine valve floater has successfully closed the brine line.
14. Open the outlet manual valve. And a faucet downstream the softener. Softener is now in service and fully operating.
15. After the softener have been running a few minutes in service cycle, proceed to hardness test on the outlet water to make sure the water is treated.

**Note**
This procedure is intended for system using a salt platform in the brine tank. Not using a salt platform may result in salt consumption discrepancies and softener loss of efficiency.

## 7.2. Sanitization

### 7.2.1. Disinfection of water softeners

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

Thus, your conditioner may need to be disinfected after installation. Some conditioners will require periodic disinfection during their normal life. Consult your installing dealer for more information on disinfecting your conditioner.

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

### 7.2.2. Sodium or calcium hypochlorite

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

**5.25% Sodium hypochlorite**

If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.

**Dosage**

Polystyrene resin: set 35.5 mL fluid (1.2 ounce) per 28.3 L (1 cubic foot) of resin.

Non-resinous exchangers: set 23.7 mL fluid (0.8 ounce) per 28.3 L (1 cubic foot).

**Brine tank softeners**

Backwash the conditioner and add the required amount of hypochlorite solution to the well of the brine tank. The brine tank should have water in it to permit the solution to be carried into the conditioner.

Proceed with the normal regeneration.

**Calcium hypochlorite**

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

**Dosage**

Measure two grains (~ 3 mL [0.1 ounce]) per 28.3 L (1 cubic foot).

**Brine tank softeners**

Backwash the conditioner and add the required amount of hypochlorite to the well of the brine tank. The brine tank should have water in it to permit the chlorine solution from being carried into the conditioner.

Proceed with the normal regeneration.

### 7.2.3. Electro chlorination

Valves or systems already equipped with an electrochlorinator device or system are supposed to be sanitized during the brine draw phase.

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# 8. Operation

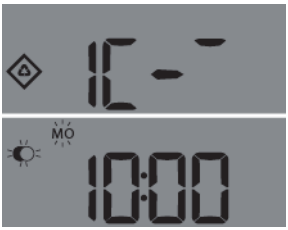
## 8.1. Recommendations

- Use only regeneration salts designed for water softening EN973.
- For optimal system operation, the use of clean salt free from impurities is recommended (for example salt pellets).
- Do not use ice melt salt, block, or rock salts.
- The sanitizing process (both with liquid and electrochlorination) may introduce chlorine compounds which may reduce the life of the ion exchange resins. Refer to media manufacturer specs sheets for more information.

## 8.2. Manual regeneration

To initiate a manual regeneration :

**A** Press and hold ◈ for 5 seconds.
→ The SFE controller can be used to either start regeneration immediately or delay it until the programmed time.




**B** Use ⬇ ⬆ to scroll between immediate regeneration or delayed regeneration at the programmed time.

**C** Confirm with ◈.
→ When Delayed manual regeneration is chosen, the current day of the week and the service icon will blink until regeneration starts.

## 8.3. Cancelling a regeneration

**A** If a regeneration has started, the regeneration can be cancelled by pressing ◈ for 5 seconds.
→ The controller will then place the valve back in the service position.

## 8.4. Microswitch search

When powered on, the module may sometimes display F1-| or F2-|, where the number indicates the first or second microswitch attempt. A rotating bar is also shown to indicate that the motor is on. If both searches fail, the message FR01 is displayed.

## 8.5. Salt recharge

The controller has a counter that decreases by one at each regeneration. When the counter reaches 0, a salt alarm is generated. To recharge the counter to the initial value of the parameter SA, press and hold ⬇ when the module is in service, "SAL" will flash on the display for 5 seconds and the counter will be reset to the setup value.

# 9. Maintenance

**Mandatory**
Cleaning and maintenance shall take place at regular intervals in order to guarantee the proper functioning of the complete system.

**Danger**
Any valve maintenance operation must be carried out in the absence of hydraulic pressure. For this reason, disconnect the water delivery line to the valve.

## 9.1. Recommendations

### 9.1.1. Use original spare parts

**Caution**
To ensure correct operation and safety of the device, only use original spare parts and accessories recommended by the manufacturer.

Parts to keep in stock for potential replacements are the motor, controller, transformer, injectors, O-ring kit and DLFC.

### 9.1.2. Use original approved lubricants

- Silicone grease (cod. 8500)

### 9.1.3. Maintenance instructions

- Disinfect and clean the system at least once a year or if the treated water has an off-taste or an unusual odour.
- Perform a hardness test every year for softeners.

## 9.2. Cleaning and maintenance

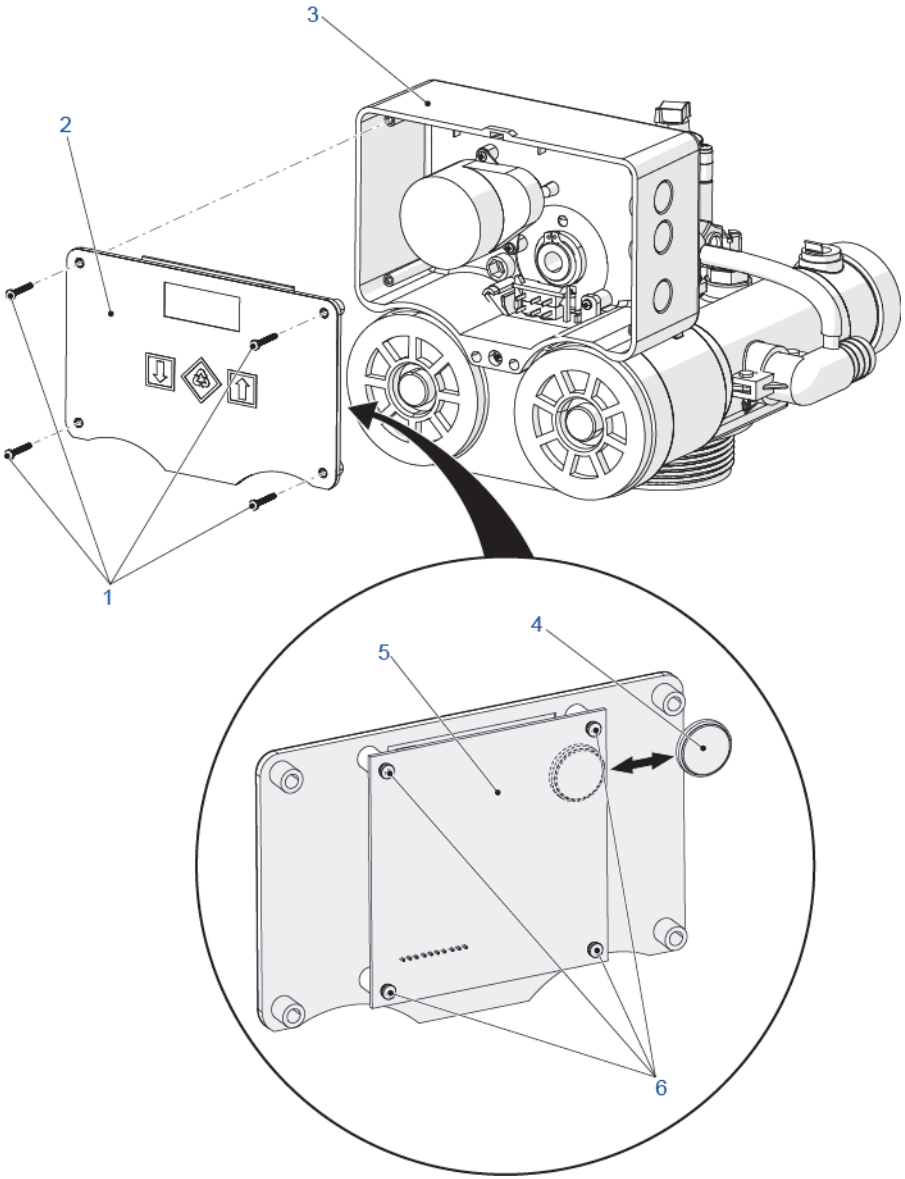
### 9.2.1. Cleaning and maintenance

Before any cleaning or maintenance procedure, complete the following step :

| No. | Operation |
|---|---|
|  | **Caution**<br>These operations need to be performed before any cleaning or maintenance procedure. |
| **A** | Unplug the wall-mounted transformer. |
| **B** | Shut off water supply or put bypass valve(s) into bypass position. |
| **C** | Relieve system pressure before performing any operations. |

### 9.2.2. Replacing the controller battery

| No. | Operation |
|---|---|
|  | **Note**<br>The battery should be changed every year. |
| **A** | Using a screwdriver, unscrew the four screws (1). |
| **B** | Remove the front panel (2) from the controller (3). |
| **C** | Using a plastic screwdriver, unscrew the four screws (6). |
| **D** | Change the battery (4) on the electronic board (5). |
|  | **Note**<br>Battery : FDK Lithium battery CR2032u 3V. |
| **E** | Reverse above procedure steps to rebuild. |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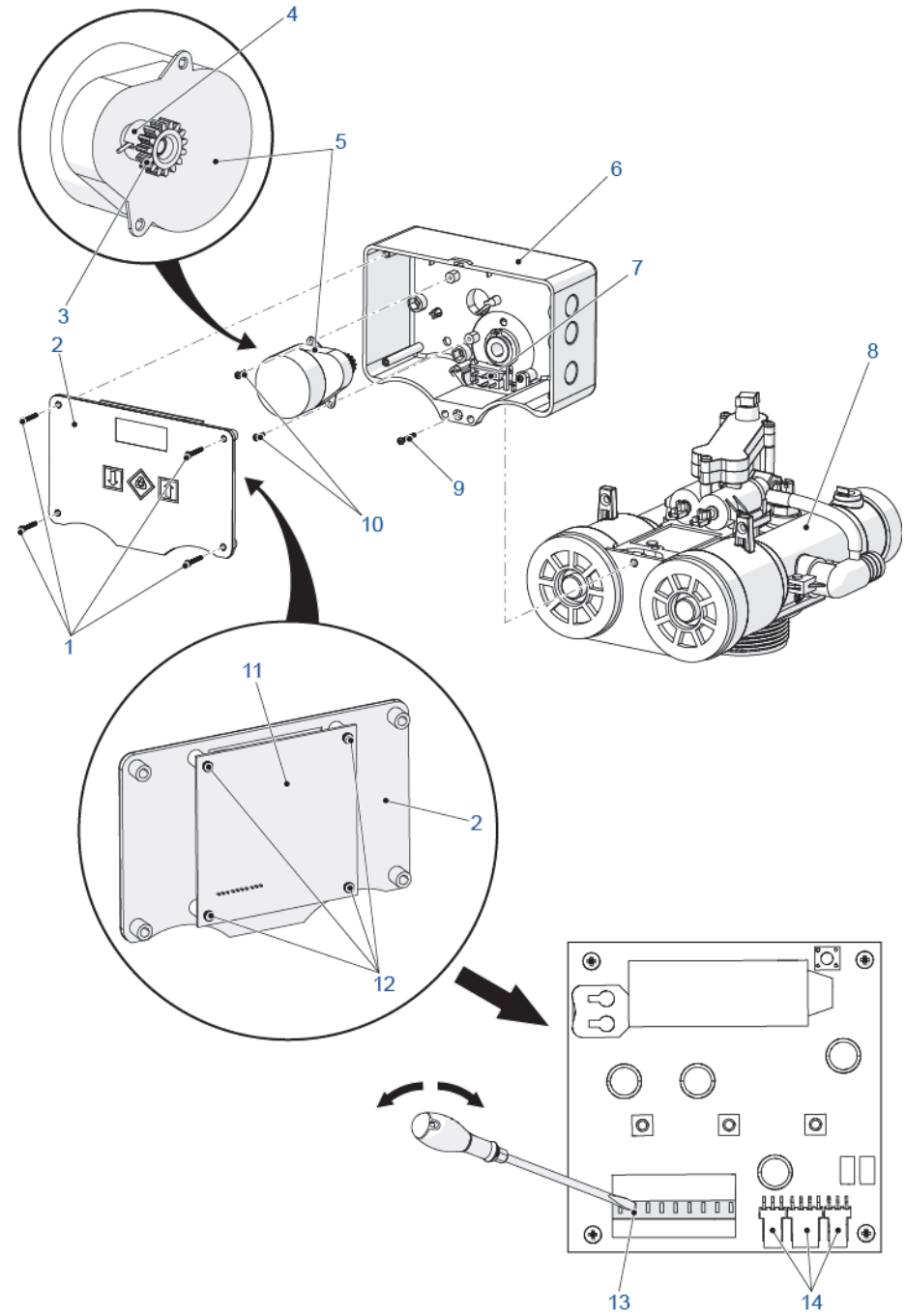
### 9.2.3. Motor replacement

| No. | Operation |
|---|---|
| **A** | Using a screwdriver, unscrew the screw (9). |
| **B** | Remove the controller (6) from the valve (8). |
| **C** | Using a screwdriver, unscrew the four screws (1). |
| **D** | Remove the front panel (2) from the controller (6). |
| **E** | Using a screwdriver, unscrew the two screws (10). |
| **F** | Remove the motor (5). |
| **G** | Remove the pinion (3) and check the condition of the spring (4). |
| **H** | If necessary, unscrew and change the spring (4) using pliers. |
| **I** | Using a plastic screwdriver, unscrew the four screws (12) to access the electronic board (11). |
| **J** | If necessary, disconnect the three connectors (14) and replace the motor (5). |
| | **Note**<br>Pay attention to the connector order. |
| **K** | Reverse above procedure steps to rebuild. |

### 9.2.4. Microswitch replacement

| No. | Operation |
|---|---|
| **A** | Using a screwdriver, unscrew the screw (9). |
| **B** | Remove the controller (6) from the valve (8). |
| **C** | Using a screwdriver, unscrew the four screws (1). |
| **D** | Remove the front panel (2) from the controller (6). |
| **E** | Using a plastic screwdriver, unscrew the four screws (12) to access to the electronic board (11). |
| **F** | Using a plastic flat screwdriver, disconnect the microswitch cable (13). |
| **G** | Disconnect the connectors (7) and change the microswitch. |
| **H** | Reverse above procedure steps to rebuild. |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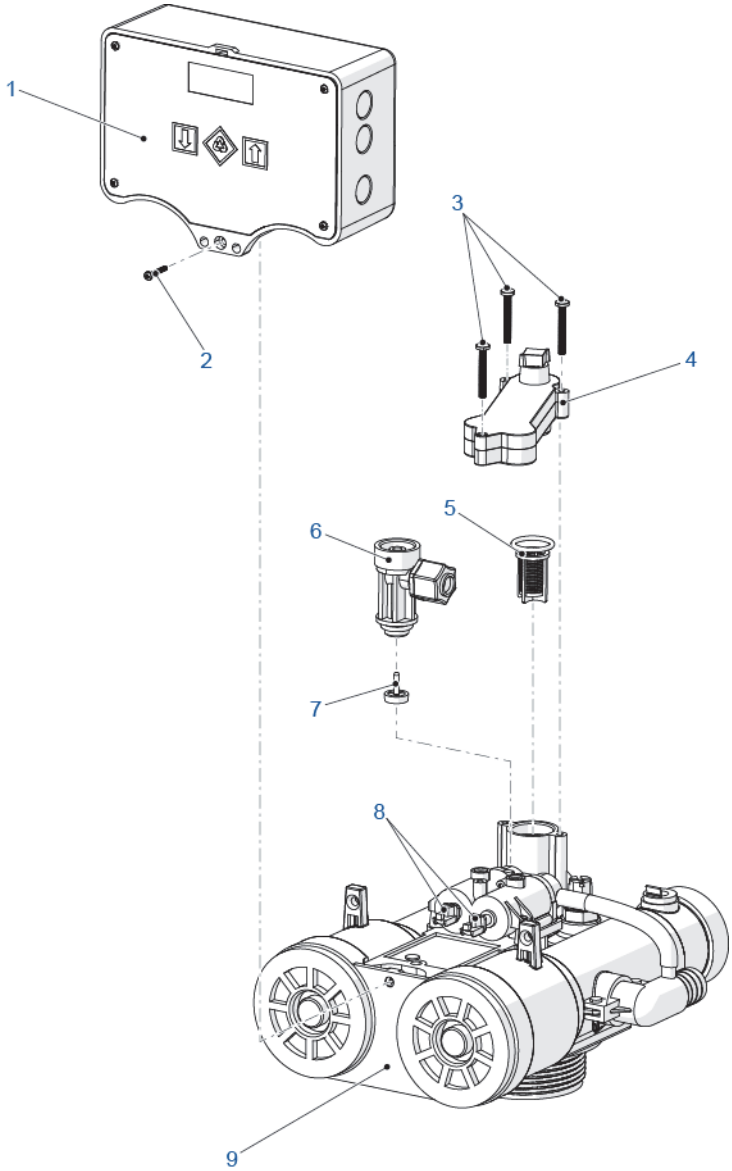
### 9.2.5. Cleaning the injector and the injector screen

| No. | Operation |
|---|---|
| **A** | Using a screwdriver, unscrew the screw (2). |
| **B** | Remove the controller (1) from the valve (9). |
| **C** | Manually actuate the pistons (8) to drain the water from inside the valve. |
| **D** | Using a screwdriver, unscrew the three screws (3). |
| ⚠ | **Caution**<br>Unscrew the screws slowly to prevent gripping between the material and the screws. |
| **E** | Remove the collector (4). |
| **F** | Remove and clean the injector (6) and the flow breaker (7). |
| **G** | Using pliers, remove and clean the injector screen (5). |
| ℹ | **Note**<br>Use water or compressed air to clean the injector, flow breaker and injector screen. |
| **H** | Replace and grease all the O-rings with silicone grease (cod. 8500). |
| **I** | Reverse above procedure steps to rebuild. |
| ⚠ | **Caution**<br>When reassembling the collector :<br>- Try to match the self tapping screws with the original thread;<br>- Slowly screw by hand without forcing then tighten using a screwdriver;<br>- Always carry out these operations using normal screwdrivers; do not use automatic screwdrivers. |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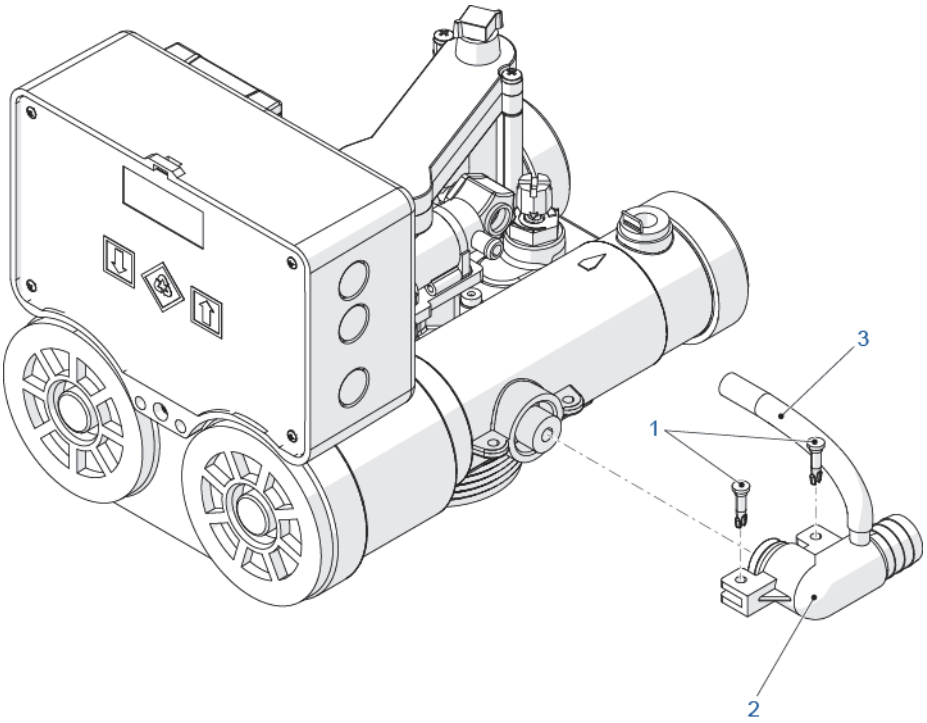
### 9.2.6. Replacing the drain connection

| No. | Operation |
|---|---|
| **A** | Unplug the pilots to drain tube (3). |
| **B** | Push out the two locking pins (1). |
| **C** | Slip off and change the drain manifold (2). |
| **D** | Replace and grease all the O-rings with silicone grease (cod. 8500). |
| **E** | Reverse above procedure steps to rebuild. |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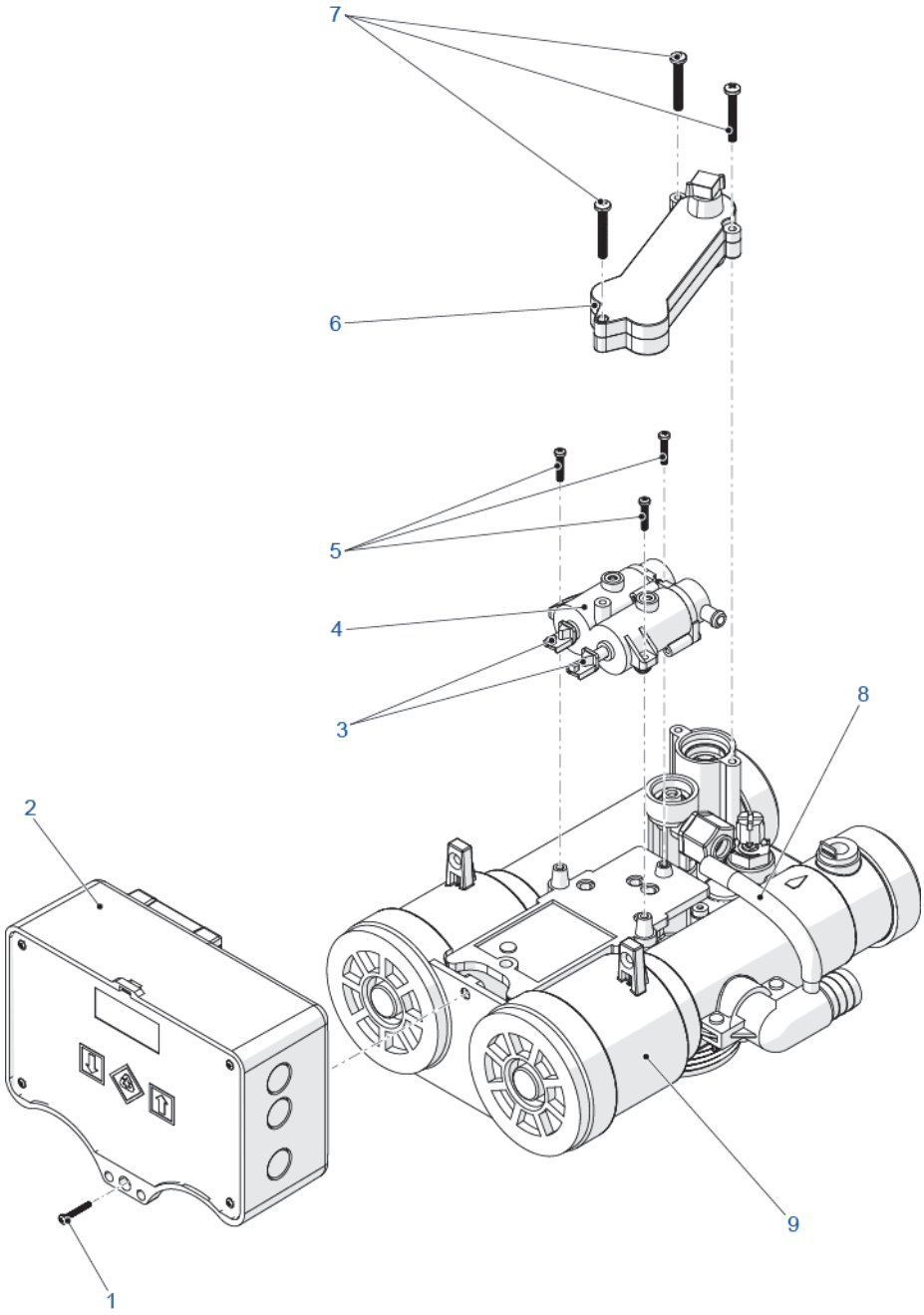
### 9.2.7. Replacing the twin pilots

| No. | Operation |
|---|---|
| **A** | Using a screwdriver, unscrew the screw (1). |
| **B** | Remove the controller (2) from the valve (9). |
| **C** | Manually actuate the pistons (3) to drain out the water inside the valve to the drain. |
| **D** | Using a screwdriver, unscrew the three screws (7). |
| ⚠ | **Caution**<br>Unscrew the screws slowly to prevent gripping between the material and the screws. |
| **E** | Remove the collector (6). |
| **F** | Using a screwdriver, unscrew the three screws (5). |
| **G** | Unplug the pilots to drain tube (8). |
| **H** | Remove and change the twin pilot (4). |
| ℹ | **Note**<br>Replace all of the twin pilots (4) in case of damage. Only the pistons (3) can be changed separately. |
| **I** | Replace and grease all the O-rings with silicone grease (cod. 8500). |
| **J** | Reverse above procedure steps to rebuild. |
| ⚠ | **Caution**<br>When reassembling the collector :<br>- Try to match the self tapping screws with the original thread;<br>- Slowly screw by hand without forcing then tighten using a screwdriver;<br>- Always carry out these operations using normal screwdrivers; do not use automatic screwdrivers. |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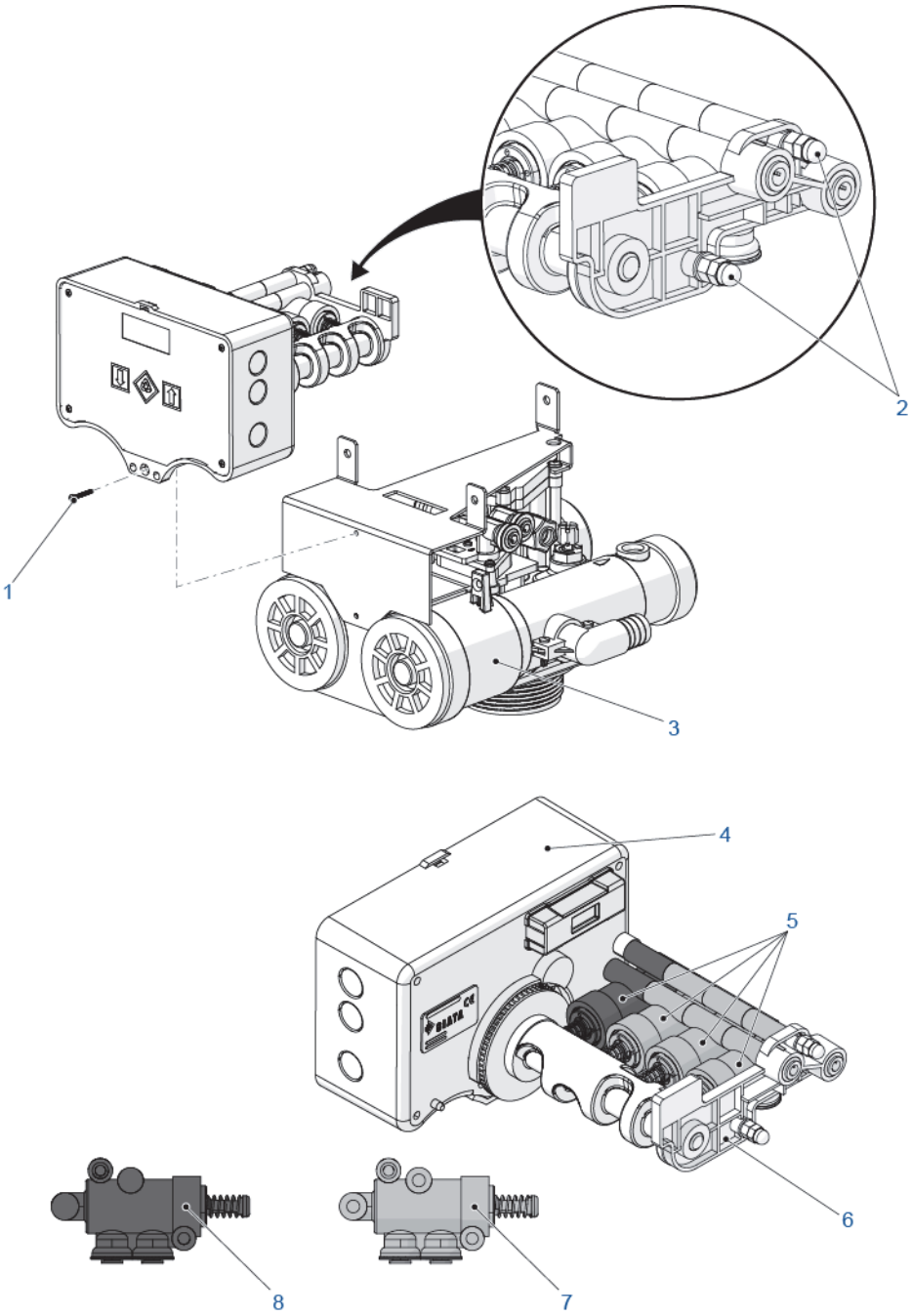
### 9.2.8. Replacing the pilots (external drivers connections)

| No. | Operation |
|---|---|
| **A** | Using a screwdriver, unscrew the screw (1). |
| **B** | Remove the controller with the pilots (4) from the valve body (3). |
| **C** | Unscrew and remove the screws, the nuts and the washers (2). |
| **D** | Remove the clamping plate (6). |
| **E** | Remove and change the pilots (5). |
| | **Note**<br>Replace the entire pilot (5) in case of damage. |
| **F** | Replace and grease all the O-rings with silicone grease (cod. 8500). |
| **G** | Reverse above procedure steps to rebuild. |
| | **Note**<br>Pay attention to the pilot order. The pilot with two holes (8) is placed next to the controller, the others pilots with four holes (7) follow. |
| | **Note**<br>The number of pilots can vary according to the valve configuration. |
| | **Caution**<br>When reassembling, be sure to place the O-rings between each pilot. |

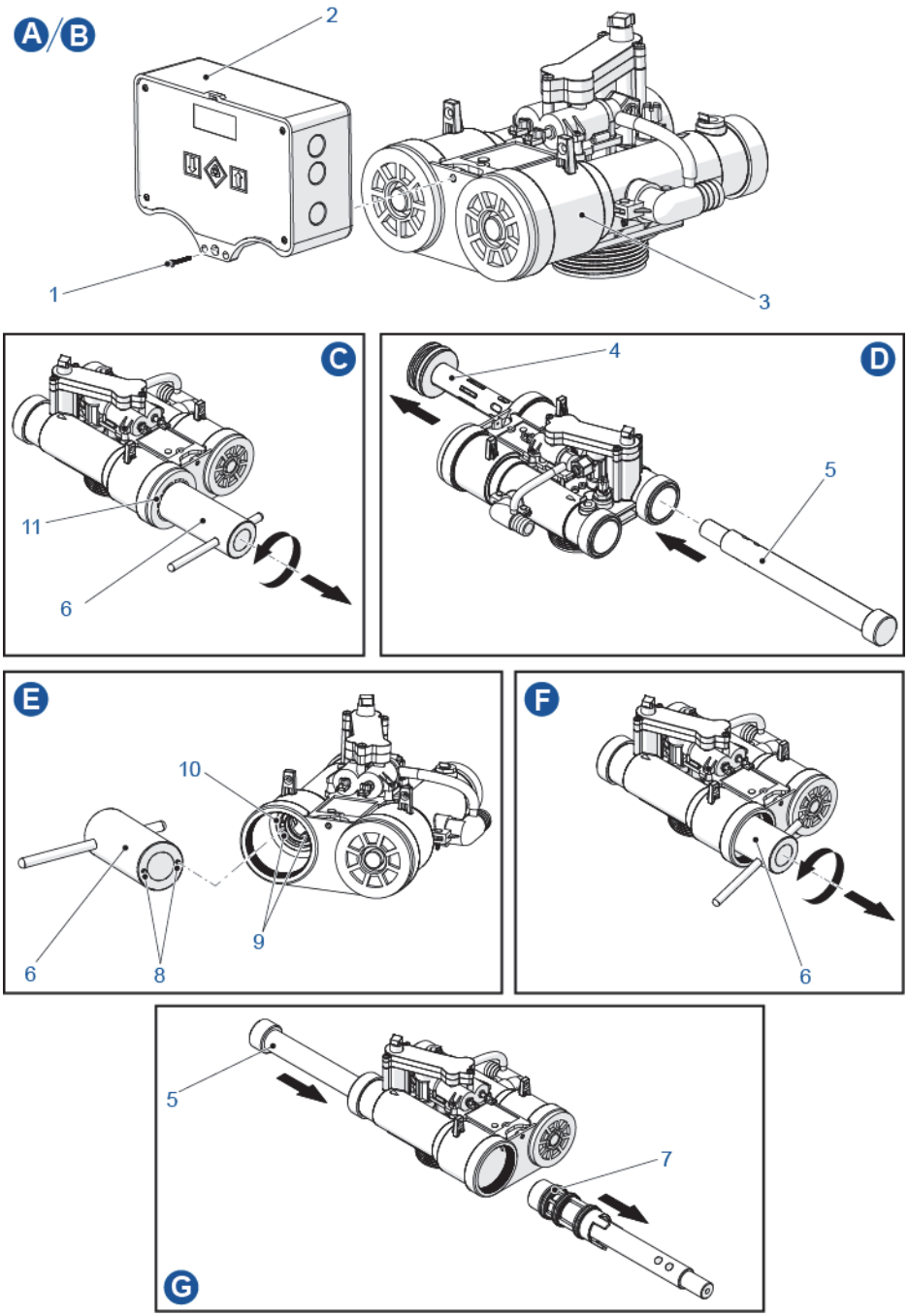

1
2
3
4
5
6
7
8

## 9.2.9. Replacing the internal pistons and the seals and spacers

### 9.2.9.1 Disassembly

**Note**
The procedure to disassemble the inlet and outlet pistons is the same.

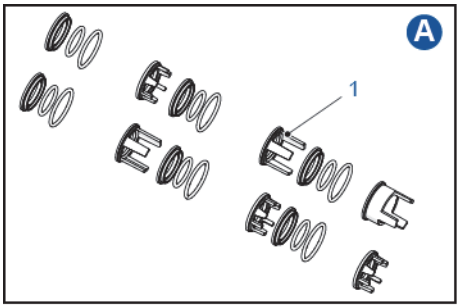
| No. | Operation |
|---|---|
| | **Note**<br>Use special tools from the 2238/05 kit to disassemble the valve internal parts. |
| | **Caution**<br>Disconnect the inlet / outlet fitting before proceeding. |
| **A** | Using a screwdriver, unscrew the screw (1). |
| **B** | Remove the controller (2) from the valve (3). |
| **C** | Using tool (6), unscrew the valve cap (11). |
| **D** | Match the tool (5) with the piston hole and push to slip off the piston (4). |
| **E** | Using tool (6), try to match the pins (8) of the tool in the ring nut's holes (9). |
| **F** | Using tool (6), unscrew and remove the ring nut (10). |
| **G** | Place tool (5) inside the valve and pull until you slip off the seals and spacers pack (7). |
| | **Caution**<br>Do not forget the correct sequence of the seals and spacers pack (7). If you reassemble the pack incorrectly, the valve will not work properly. |
| | **Note**<br>The sequence of the seals and spacers is different for the valve inlet and outlet. |
| **H** | If necessary, change the piston (4) and the seals and spacers pack (7). |
| **I** | Replace and grease all the O-rings with silicone grease (cod. 8500). |
| | **Note**<br>Take care not to mix up the inlet and outlet pistons (the inlet piston is bigger than the outlet piston). |

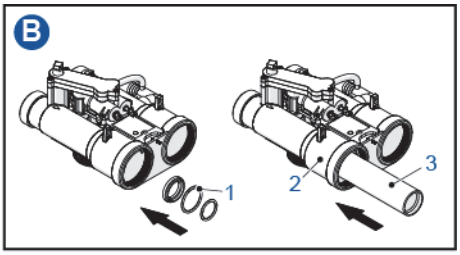

A/B
2
1
3
C
11
6
D
4
5
E
10
6
8
9
F
6
5
7
G

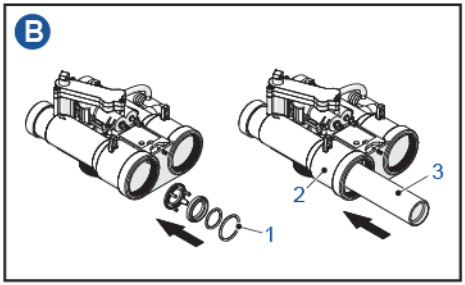
### 9.2.9.2 Assembly

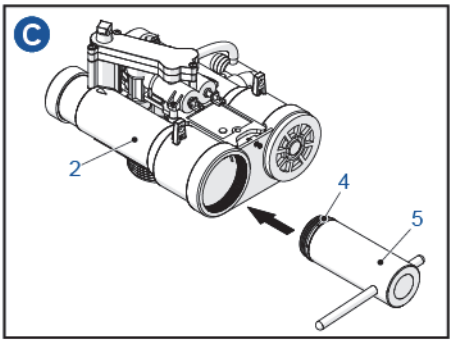
**Note**
The procedure to assemble the inlet and outlet pistons is the same.

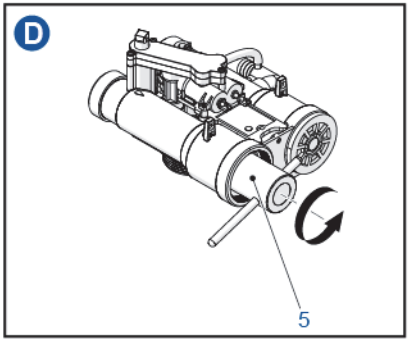
| No. | Operation |
|---|---|
| | **Note**<br>Use special tools from the 2238/05 kit to assemble the valve internal parts. |
| | **Note**<br>Before reassembling, grease with silicone grease (cod. 8500) :<br>- The inlet and outlet pistons;<br>- The seals and spacers pack and the ring nut. |
| | **Note**<br>The sequence of the seals and spacers is different for the valve inlet and outlet. |
| **A** | Reassemble the seals and spacers (1). |
| | **Caution**<br>Do not forget the correct sequence of the seals and spacers pack (1). If you reassemble the pack incorrectly, the valve will not work properly. |
| **B** | Using tool (3),place the seals and spacers (1) in the valve (2). |
| **C** | Using tool (5), try to match the pins of the tool in the ring nut's holes and place the ring nut (4) in the valve (2). |
| **D** | Using tool (5), screw the ring nut. |
| **E** | Match the tool (7) with the piston hole and push to slip in the piston (6). |
| **F** | Using tool (5), screw the valve cap (8). |
| **G** | Place the controller (10) on the valve (2) and using a screwdriver, screw the screw (9). |

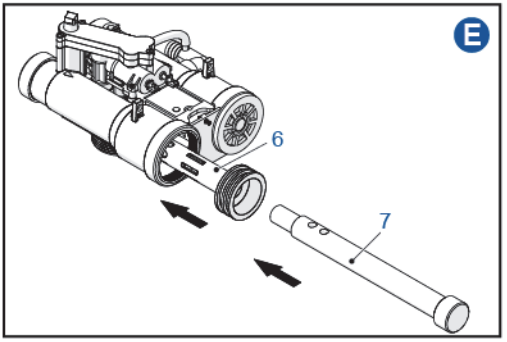

A
1

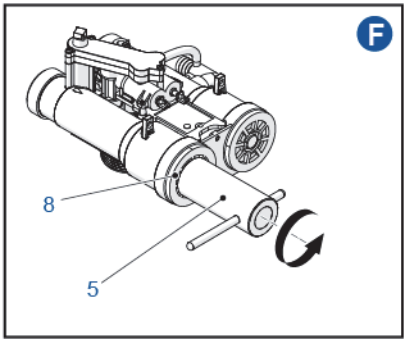

B
1
2
3

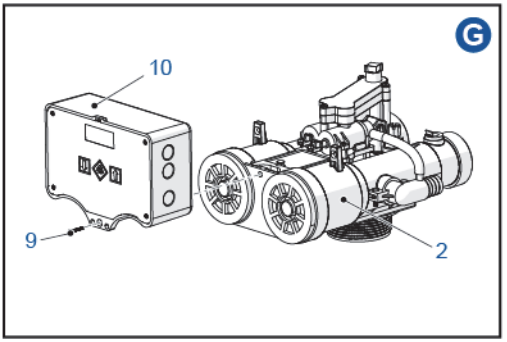

B
1
2
3


C
2
4
5

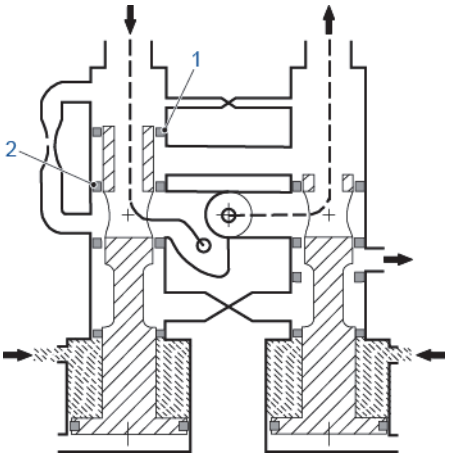

D
5


E
6
7


F
8
5


G
10
9
2

# 10. Troubleshooting




| Issue | Cause | Reset and recovery |
|---|---|---|
| Leaks to the drain during service or when in stand-by. | Leak from pilot. | **A** Twin pilot valve : Before closing the inlet water supply, disconnect the drain rubber tube and check if there is a leakage from that tube. In case there is one, close inlet water pressure and change the twin pilot assembly.<br>**B** External distributor valve : Before closing the inlet water supply, disconnect the drain plastic tube from the pilot distributor system and check if there is a leakage from the drain port. In case there is one, one or more pilots must be replaced.<br>A pilot circuit leakage can also cause malfunctions of the valve because the pressure can not be maintained in the pressure chambers and hence the piston of the valve can be badly positioned. After solving the pilot leakage problem, restore inlet water supply and put the controller in service position to check if leakage has stopped. If the leakage remains, contact your supplier for maintenance on the valve. |

| Issue | Cause | Reset and recovery |
|---|---|---|
| Leaks to the drain during service or when in stand-by. | Leak through the piston /seals and spacer system. | If the water leaking from the drain is softened check for damages on the outlet part of the valve, in particular outlet piston or seals and spacers. Otherwise check for damages on the inlet part of the valve. Dismount the pistons and the seals and spacer pack. Visually check every items inside the valve and replace the damaged part. If more that a third of the total O-rings needs to be replaced, change the complete piston and seals and spacers sub-assembly. |
| Hard water detected in the outlet. | Probable leakage between inlet and outlet or between the valve and tank seal. | **A** Damage on the inlet internals O-ring (1) and (2) or on the inlet piston. Dismount the valve and visually check these items. Replace them if they are damaged.<br>**B** The rise pipe O-ring may be damaged, disconnect the valve from the tank and check the O-ring status. |
| | High pressure drop is causing the opening of the automatic bypass. | If mixing is not desired replace the automatic bypass with a manual bypass model. |
| | Inlet piston is out of position causing bypass between inlet and outlet. | In that case a leakage on the drain should also be observed. Check for problems on the pilot circuit otherwise check if the pilot pressure is in compliance with the valve specifications. For twin pilot valves, the screen inside the manifold may be plugged by dirt causing pressure drop on the pilot circuit. Remove and clean it. |
| | Bypass valve not closed. | Ensure that the bypass valve is closed. |

| Issue | Cause | Reset and recovery |
|---|---|---|
| No brine draw. | Low water pressure at the inlet. | Close the outlet of the valve, check that the pressure gauge shows a pressure of at least 2 bars. If it is lower, the pressure is insufficient. If the pressure is higher than 2 bar, check the mechanical filter which is installed before the injector is plugged by dirt. Remove it and clean. |
| | Screen on the manifold is plugged by dirt. | Remove manifold and screen and clean thoroughly. |
| | Plugged injector. | Remove injector, thoroughly clean the holes in the injector and remount it. |
| | Problems in salt / brine tank. | Thoroughly check the connection assembly to the brine tank:<br>**A** Check that there are no obstructions in the connection system.<br>**B** Check that there is a flow when the float is in lower position.<br>**C** Check that there is no formation of a salt bridge in the brine tank.<br>**D** Check that all components of the brine valve operate efficiently. |

# 11. Spare parts

## 11.1. Fittings

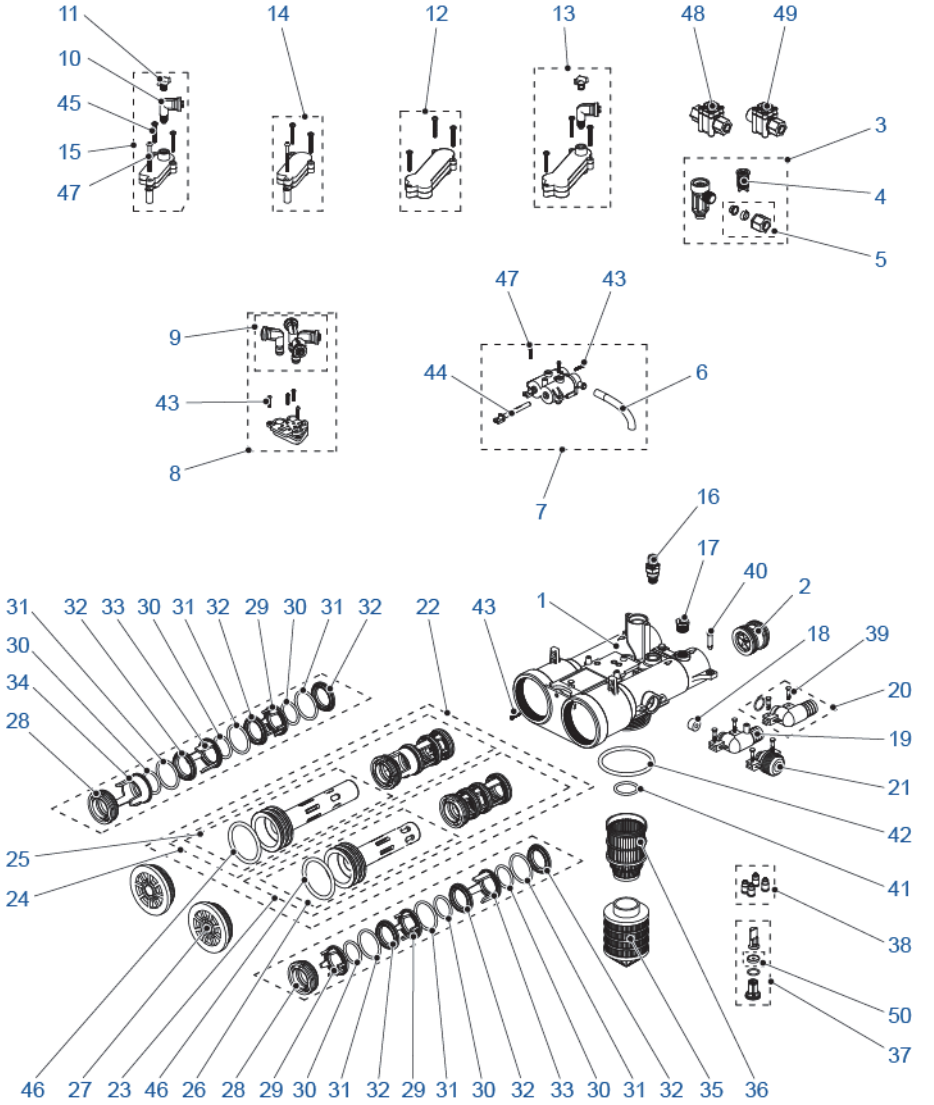
**For V132 with quick inlet and outlet ports**

| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| | 2265-A/05 | Kit Fitting ¾" BSP female Threaded (NYLON) | 1 |
| | 2265-B/05 | Kit Fitting 1" BSP female Threaded (NYLON) | 1 |
| | 2265-C/05 | Kit Fitting 1 ¼" BSP female Threaded (NYLON) | 1 |
| | 2265-D/05 | Kit Fitting Ø 32 mm for DN 25 pipe To glue (ABS) | 1 |
| | 2265-GB/05 | Kit Fitting Ø 33,5 mm 1" pipe (ASTM) To glue (ABS) | 1 |
| | 2265-K/05 | Kit Fitting 1 ½" BSP female Threaded (NYLON) | 1 |
| | 2265-H/05 | Kit Fitting 1" BSP female - 1 ½" BSP male Threaded (NYLON) | 1 |
| | 2265-I/05 | Kit Fitting 1 ¼" BSP female - 2" BSP male Threaded (NYLON) | 1 |

**For V132 threaded inlet and outlet ports**

| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| | 494-B/05 | Kit Fitting 1 ¼" BSP female Threaded (PVC) | 1 |
| | 494-C/05 | Kit Fitting Ø 40 mm for DN 32 pipe To glue (PVC) | 1 |
| | 494-F/05 | Kit Fitting 1 ½" BSP male Threaded (BRASS) | 1 |
| | 494-S/05 | Kit Fitting 1 ¼" NPT female Threaded (PVC) | 1 |
| | 494-T/05 | Kit Fitting Ø 42.4 mm for 1 1/4"pipe (ASTM) To glue (PVC) | 1 |

## 11.2. Valve parts list

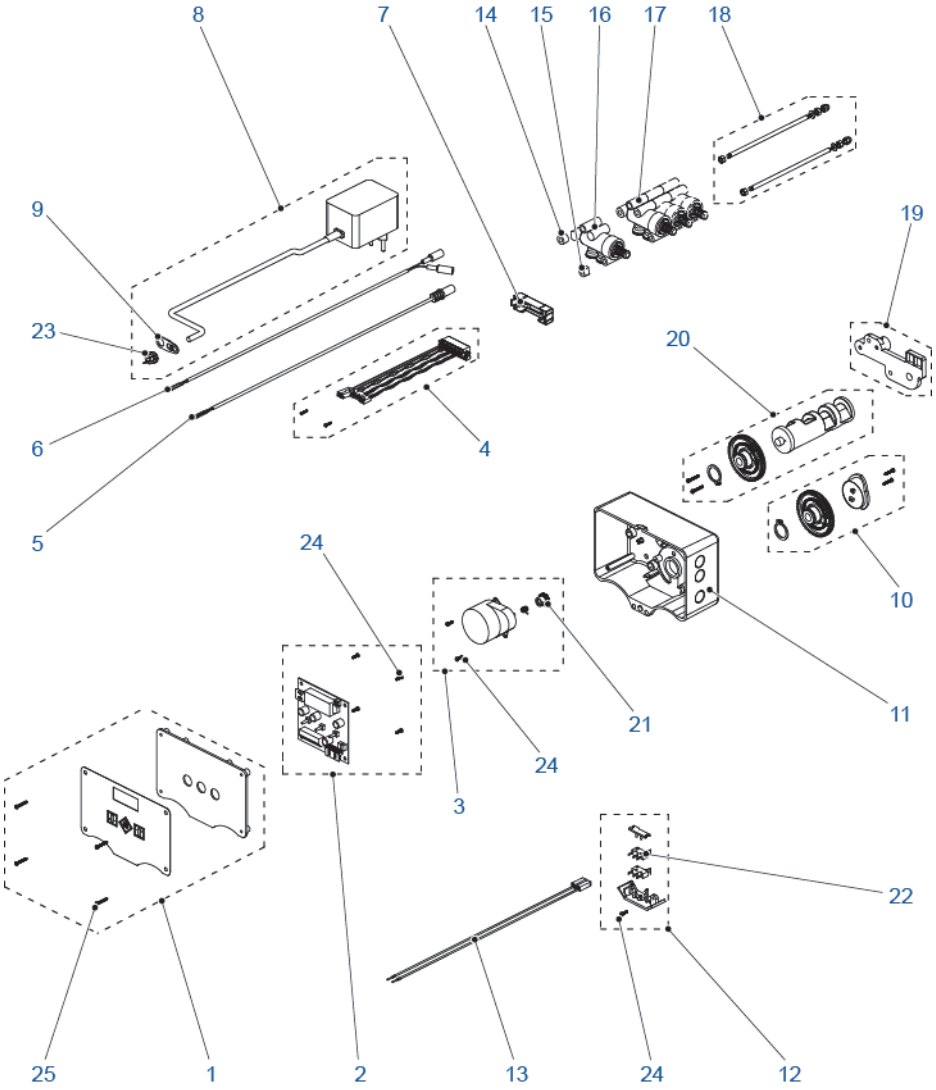


| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| 1+17+27 | 2256-K01/05 | Valve Body service kit | 1 |
| | 2256-K02/05 | Valve Body service kit volumetric | 1 |
| 2 | 2222/05 | Internal Turbine assembly | 1 |
| 3 | 2231-B/05 | Injector Assy - Blue | 1 |
| | 2231-F/05 | Injector for filter valves | 1 |
| | 2231-G/05 | Injector Assy - Grey | 1 |
| | 2231-M/05 | Injector Assy - Brown | 1 |
| | 2231-N/05 | Injector Assy - Black | 1 |
| | 2231-R/05 | Injector Assy - Red | 1 |
| 4 | 18-K/05 | Injector screen | 10 |
| 5 | 66/05 | Nut + tube sleeve | 1 |
| | 66-K/05 | Nut + tube sleeve | 100 |
| 6 | K1-31 | Twin pilot drain tubing kit | 10 |
| 7 | 2250/05 | Twin pilot assembly | 1 |
| | 2250-N/05 | Twin pilot assembly - Black Version | 1 |
| 8 | 2252-1/05 | External Pilots connections assy | 1 |
| | 2252-1N/05 | External Pilots connections assy - Black Version | 1 |
| 9 | 105-PORL/05 | Quick connection elbow | 4 |
| 10 | 105-AS1/05 | Quick connection elbow 1/8" threaded | 4 |
| 11 | K-23/05 | 1/8" cap with O-ring | 10 |
| | K-23-N/05 | 1/8" cap with O-ring - Black Version | 10 |
| 12 | 22-AK/05 | Twin pilot manifold assy | 1 |
| | 22-ANK/05 | Twin pilot manifold assy - Black Version | 1 |
| 13 | 22-BK/05 | Twin pilot manifold assy with 1/8" connection | 1 |
| | 22-BNK/05 | Twin pilot manifold assy with 1/8" connection - Black Version | 1 |
| 14 | 22-CK/05 | Short manifold | 1 |
| | 22-CNK/05 | Short manifold - Black Version | 1 |
| 15 | 22-DK/05 | Short manifold with 1/8" connection | 1 |
| | 22-DNK/05 | Short manifold with 1/8" connection | 1 |
| 16 | 24509-01 | Mixing Assy | 1 |

| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| 17 | K-2224-A/05 | Turbine sensor holder nut | 10 |
| 18 | K-70-1 | Flow control Ø3-mm. & 320 L/h (#70-1) | 10 |
| | K-70-2 | Flow control Ø3.5-mm. & 480 L/h (#70-2) | 10 |
| | K-70-3 | Flow control Ø4-mm. & 700 L/h (#70-3) | 10 |
| | K-70-4 | Flow control Ø5-mm. & 950 L/h (#70-4) | 10 |
| | K-70-5 | Flow control Ø6-mm. & 1450 L/h (#70-5) | 10 |
| 19 | K1-2249/05 | Drain hose elbow for twin pilot valves | 5 |
| | K1-2249-N/05 | Drain hose elbow for twin pilot valves - Black Version | 5 |
| 20 | K1-2249-C/05 | Drain hose elbow for external connection valves | 5 |
| | K1-2249-CN/05 | Drain hose elbow for external connection valves - Black Version | 5 |
| 21 | K1-2249-A/05 | Drain connection 1" BSP male | 5 |
| | K1-2249-AN/05 | Drain connection 1" BSP male - Black Version | 5 |
| 22 | 2230/05 | Pistons w/ Seals & Spacers assy | 1 |
| | 2230-D/05 | Pistons w/ Seals & Spacers assy for demineralization cationic | 1 |
| 23 | 2230-OUT/05 | Outlet Piston w/ Seals & Spacers assy | 1 |
| | 2230-DOUT/05 | Outlet Piston w/ Seals & Spacers assy for demineralization cationic | 1 |
| 24 | 2230-IN/05 | Inlet Piston w/ Seals & Spacers assy | 1 |
| | 2230-DIN/05 | Inlet Piston w/ Seals & Spacers assy for demineralization cationic | 1 |
| 25 | 1918/05 | Inlet piston assy | 1 |
| 26 | 1918-C/05 | Outlet piston assy | 1 |
| 27 | 1915/05 | Valve Cap assy | 1 |
| | 1915-N/05 | Valve Cap assy - Black Version | 1 |
| 28 | K1-1518/05 | Seals & Spacers Pack closure nut | 10 |
| 29 | K1-14 | Short Spacer | 10 |
| 30 | K1-44 | Internal O-rings | 10 |
| 31 | K1-45 | External O-rings | 10 |
| 32 | K1-13 | Seals Holder ring | 10 |
| 33 | K1-15 | Medium length spacer | 10 |
| 34 | K1-16 | Longer spacer | 10 |

| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| 35 | 1002-D32 | Bottom Strainer (Ø 32.mm) | 1 |
| 36 | 1001-32I | Upper Strainer | 1 |
| 37 | K-10026 | Backwash flow control kit without backwash flow control washer kit | 1 |
| 38 | K-10028 | Driver Replica Connection | 1 |
| 39 | K-9-S/05 | Drain connection lock pin | 10 |
| 40 | K-9/05 | Inlet/Outlet connection lock pin | 10 |
| 41 | K-46-1/05 | Rise pipe O-ring | 10 |
| 42 | K1-6300-62 | Tank adapter O-ring | 10 |
| 43 | K1-104 | Controller fixing screws | 10 |
| 44 | 32-GR/05 | Small Piston for Twin Pilot Assy | 1 |
| 45 | 106-K/05 | Manifold screws | 10 |
| 46 | K-41/05 | Piston O-rings | 10 |
| 47 | K-102-L1/05 | Short manifold screws | 10 |
| 48 | 590-A/05 | Chlorine cell remote mount | 1 |
| 49 | 590-B/05 | Chlorine cell direct mount | 1 |
| 50 | K-10027 | Backwash flow control washers kit | 1 |

## 11.3. SFE spare parts



| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| 1 | 856-SFE-K1 | SFE controller front plate kit with standard label | 1 |
| 2 | K-7930-24 | Electronic board SFE standard w/ chloride driver | 1 |
| | K-7930-23 | Electronic board SFE standard | 1 |
| 3 | 94-R7K/05 | Standard 12V motor kit | 1 |
| 4 | K-10117 | SFE back connector kit w/ internal wiring | 1 |
| 5 | K-10110 | Kit meter cable for back connector | 1 |
| 6 | K-10111 | Chloride cell cable for back connector | 1 |
| 7 | K-10113 | SFE back connector cover cap | 10 |
| 8 | K-10009 | Transformer standard 230/12 VAC 600mA | 1 |
| 9 | K-90 | Cable lock clip | 10 |
| 10 | 2229/05 | Twin pilot cam kit | 1 |
| 11 | K-10114 | Kit SFE standard box - Blue Version | 1 |
| | K-10115 | Kit SFE standard box - Black Version | 1 |
| 12 | K88-L2/05 | Kit aux and homing for Microswitch with blue support | 1 |
| | K88-BKL2/05 | Kit aux and homing for Microswitch with black support | 1 |
| 13 | K-10118 | Microswitch red harness kit | 1 |
| 14 | K-10147 | Kit blue spacer | 10 |
| | K-10145 | Kit black spacer | 10 |
| 15 | K-10148 | Kit blue spacer w/ chamfer | 10 |
| | K-10146 | Kit black spacer w/ chamfer | 10 |
| 16 | 2253-AM/05 | Kit external pilot with blind holes (1th pilot) - Blue Version | 1 |
| | 2253-AMN/05 | Kit external pilot with blind holes (1th pilot) - Black Version | 1 |
| 17 | 2253-BM/05 | Kit external pilot with clearance holes - Blue Version | 1 |
| | 2253-BMN/05 | Kit external pilot with clearance holes - Black Version | 1 |
| 18 | 468-K2 | Tie rods & nuts kit for 2 pilot camshaft | 1 |
| | 468-K3 | Tie rods & nuts kit for 3 pilot camshaft | 1 |
| | 468-K4 | Tie rods & nuts kit for 4 pilot camshaft | 1 |
| 19 | 433-KBM/05 | Camshaft backplate kit - Blue Version | 1 |
| | 433-KNM/05 | Camshaft backplate kit - Black Version | 1 |

| Item | Part number | Description | Packaging quantity |
|---|---|---|---|
| 20 | 2221-2/05 | Kit Cam 201 - 2 pilots standard | 1 |
| | 2221-2FBW/05 | Kit Cam 210 - 2 pilots for profiler | 1 |
| | 2221-3CU/05 | Kit Cam 301 - 3 pilots outlet shut-off | 1 |
| | 2221-3CA/05 | Kit Cam 303 - 3 pilots suction shut-off no refill | 1 |
| | 2221-4AU/05 | Kit Cam 409 - 4 pilots outlet + suction shut-off | 1 |
| | 2221-4FBW/05 | Kit cam 410 - 4 pilots for 2 filters sequential regeneration | 1 |
| 21 | K-114-DX | Spring for standard motor | 10 |
| 22 | K-92-F | Kit microswitch | 10 |
| 23 | K-90-XP | Kit cable holder #90-XP | 10 |
| 24 | K-118 | Screw #118 | 25 |
| 25 | K1-120 | Screw #120 | 10 |

## 11.4. Accessories

**Brine valve**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | BR1-100/05 | Brine Valve BR With Flexible Pole | 1 |

**Bypass valve**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | BP-D/06 | Direct Bypass With Prop. Mixing + Check Valve | 1 |
| | BP-D1/06 | Direct Bypass No Mixing + Check Valve | 1 |
| | BP-DN1/06 | Direct Bypass Black No Mixing + Check Valve | 1 |
| | BP-D/08 | Direct Bypass With Mixing | 1 |
| | BP-DP/06 | Direct Bypass With Prop.Mixing + Check Valve + Sample Taps | 1 |
| | BP-DP1/06 | Direct Bypass No Mixing + Check Valve +Sample Taps | 1 |
| | BP-DPN1/06 | Direct Bypass Black No Mixing + Check Valve +Sample Taps | 1 |
| | BP-DP/08 | Direct Bypass With Mixing + Sample Taps | 1 |
| | BP-DPN/06 | Direct Bypass Black With Prop.Mixing + Check Valve | 1 |
| | BP-FD/05 | Direct Bypass for Filter | 1 |
| | BP-FDP/05 | Direct Bypass for Filter + Sample Taps | 1 |
| | BP-FR/05 | Remote Bypass for Filter | 1 |
| | BP-R/06 | Remote Bypass With prop.Mixing + Check Valve | 1 |
| | BP-R1/06 | Remote Bypass No Mixing + Check Valve | 1 |
| | BP-RN1/06 | Remote Bypass Black No Mixing + Check Valve | 1 |
| | BP-RP/06 | Remote Bypass With prop.Mixing + Check Valve + Sample Taps | 1 |
| | BP-RP1/06 | Remote Bypass No Mixing + Check Valve + Sample Taps | 1 |
| | BP-RPN1/06 | Remote Bypass Black No Mixing + Check Valve + Sample Taps | 1 |

**Fittings for bypass**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | K-490/05 | Reduction 1 ½" Female - ¾" Male | 2 |
| | K-491/05 | Reduction 1 ½" Female - 1" Male | 2 |

**Meters**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | 2296/05 | Turbine Meter G 1 ½" | 1 |
| | 2297-2M/05 | Turbine Meter G ¾" (2 Magnet) | 1 |
| | 2297/05 | Turbine Meter G ¾" | 1 |

**Maintenance parts**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | 2238/05 | Kit Maintenance Tools | 1 |
| | 8500 | Silicone Grease Package 1 Kg | 1 |

**Piping (tubes & connectors)**

| Item | Code | Description | Packaging quantity |
|---|---|---|---|
| | E01480 | Brine Line Tube 3/8" | 1 |
| | 2220 | Polyethylene Tube (4 X 6) Transparent | 1 |
| | 2220-A | Polyethylene Tube (4 X 6) Azure | 1 |
| | 2220-G | Polyethylene Tube (4 X 6) Yellow | 1 |
| | 2220-N | Polyethylene Tube (4 X 6) Black | 1 |
| | 2220-R | Polyethylene Tube (4 X 6) Red | 1 |
| | 2220-V | Polyethylene Tube (4 X 6) Green | 1 |

# 12. Scrapping

The device must be scrapped in accordance with directive 2012/19/EU or the environmental standards in force in the country of installation. The components included in the system must be separated and recycled in a waste recycling centre that conforms with the legislation in force in the country of installation. This will help to reduce the impact on the environment, health, safety and help to promote recycling. Pentair do not collect used product for recycling. Contact your local recycling centre for more information.

www.pentairaquaeurope.com