PENTAIR

FLECK
2910 NXT

INSTALLER
MANUAL

Table of content

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 Fleck series, NXT controllers and water softener installation;
• knowledge of water conditioning and how to determine proper controller settings;
• basic plumbing skills.

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

1.2. Release management

Revision	Date	Authors	Description
A	12.08.2016	BRY/FLA	First edition.
B	23.05.2018	BRY/FLA	Address change, Bleam information and valve on tank assembly.

1.3. Manufacturer identifier, product

Manufacturer: Pentair International LLC
                                  Avenue de Sevelin 18
                                  1004 Lausanne
                                  Switzerland

Product: Fleck 2910 - NXT

1.4. Intended use

The device is intended for industry environment use only and it is purpose-built for water treatment.

1.5. Abbreviations used

Assy.. Assembly
BLFC .... Brine Line Flow Controller
BV.. Brine Valve
CW.. Cold Water
DF.. Down Flow
DLFC .... Drain Line Flow Controller
HW.. Hot Water
Inj .... Injector
QC.. Quick Connect
Regen .... Regeneration
S&S .... Seals & Spacers
SBV.. Safety Brine Valve
Std .... Standard
TC .... Time Clock
UF... Up Flow

1.6. Norms

1.6.1. Applicable norms

Comply with the following guidelines:
- 2006/42/EC: Machinery Directive;
- 2014/35/UE: Low Voltage Directive;
- 2014/30/UE: Electromagnetic compatibility;
- 2011/65/CE: Restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS);
- UNI EN ISO9001 (certificate no. 95.022 SSG ICS).

Meets the following technical standards:
- EN 55014-1;
- EN 55014-2;
- EN 61000-6-1;
- EN 61000-6-2;
- EN 61000-6-3;
- EN 61000-6-4;
- EN 61010-1.

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. Serial label location, page 11 and 9.1. Recommendations, page 81);
   → Description of the device problem.
B Please refer to the "Troubleshooting" chapter, page 94. 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 to profits, revenues, use, production, or contracts, or for any indirect, special or consequential loss or damage whatsoever. Please refer to the Pentair List Price for more information about terms and conditions applicable to this product.

1.10. Scan & Service application

Scan & Service mobile application is the ideal support for the maintenance person in his daily business. A simple scan of an Identification (ID) label (**1**) present on the valve with a smartphone gives an instantaneously access to all updated information related to the product, such as:

• valve's and tanks detailed configuration;
• manual;
• spare parts list;
• troubleshooting recommendations;
• multi-lingual videos, detailing how to best service a part;
• informations about new products, latest technologies, novelties about the Blue Network program, etc....

No.	Operation
A	Download the application "Scan & Service" from ⬛ **App Store** or ▶ Google play in a smartphone (**4**).
B	Open the application "Scan & Service".
C	Scan the bleam (**3**) stuck on the valve (**2**).
D	Navigate to find information.
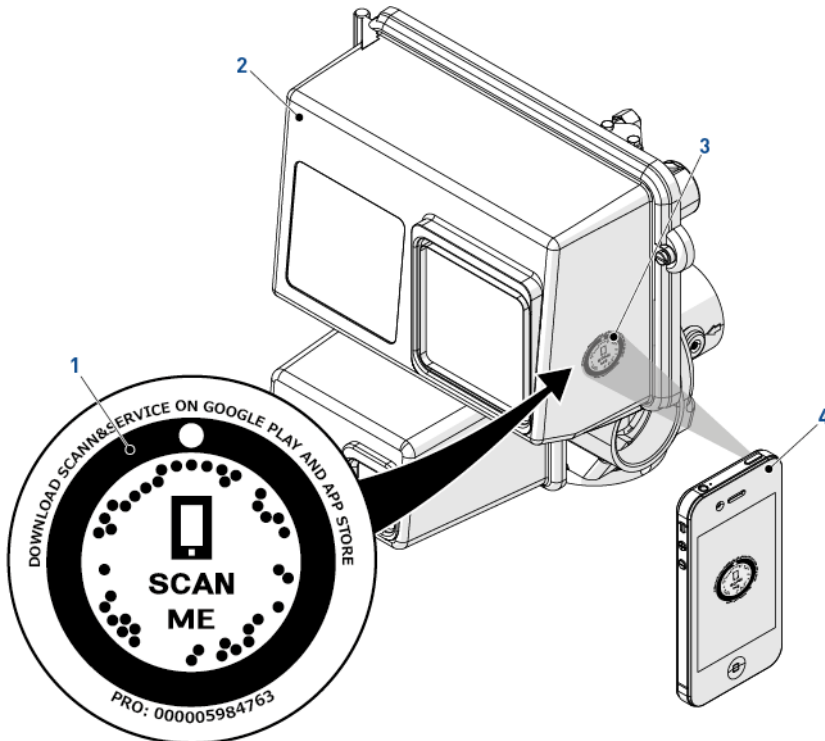
2. Safety

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.	ℹ️	**Mandatory** Standard or measure to apply.
ℹ️	**Note** Comment	🚫	**Prohibition** Restriction to be observed.

2.2. Serial label location

Model

Part number

Electrical rating

Production date

Production order

Serial number
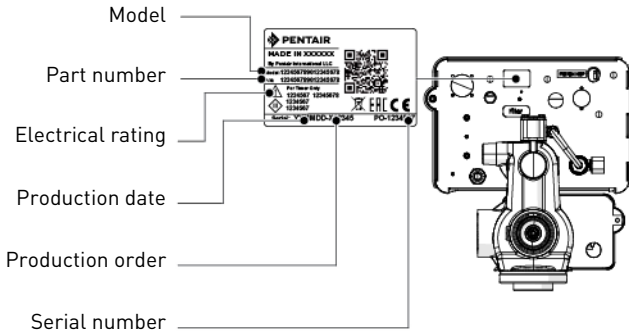
ℹ️ **Note**
Ensure that the serial label and the safety labels on the device are completely legible and clean. If necessary, replace them with new labels in the same positions.

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, safety rules and operations performed, are authorized to carry out necessary work.

2.3.2. Material

The following points must be observed to ensure proper operation of the system and the safety of user:
• be careful 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 the objects themselves.

Assembly
• Assemble only with components which are in accordance with drinking water standards;
• 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 odor problems and water contamination;
- it is therefore strongly recommended to sanitize the products. See 7.2. Sanitization, page 77;
- 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. Technical specifications

Design specifications/ratings

Valve body .... Brass
Rubber components .... EP or EPDM
Weight (valve with controller) .... 21 kg (max)
Recommended operating pressure .... 1.8 - 8.6 bar
Maximum inlet pressure .... 8.6 bar
Hydrostatic test pressure...................... 20 bar
Water temperature std........................... 1 - 43°C
Water temperature for HW volumetric .. 1 - 65°C
Water temperature for HW time clock... 1 - 82°C
Ambient temperature .... 5 - 40°C

Flow rates (3.5 bar inlet - 16°C - valve only)

Continuous (Δp = 1 bar) .... 24.0 m^3/h
Peak (Δp = 1.8 bar)................................ 31.0 m^3/h
Cv*... 27.0
Kv*... 23.4
Maximum backwash (Δp = 1.8 bar) .... 8.0 m^3/h

*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 adapter thread .... 4"8UN
Inlet/Outlet .... Female 2" (DN40) BSP
Distributor tube .... 50 mm O.D. [DN40]
Drain line .... 1" 11NPT
Brine line (1600/1650) .... ⅜"
Brine line [1700/1710] .... ½"

Electrical

Controller operating voltage .... 24 VAC
Input supply frequency .... 50 or 60 Hz (controller configuration dependent)
Transformer voltage............................... 24 VAC
Motor input voltage................................ 24 VAC
Controller power consumption .... 60 W
Protection rating.................................... IP 22
Power supply .... 230 Vac, 50/60 Hz,30 VA, Class II
Transient overvoltages........................... within the limits of category II
Pollution Degree.................................... 3

Temporary overvoltages must be limited in duration and in frequency.

Model without transformer

⚠️ **Warning**
A switch or circuit-breaker must be included in the installation, it must be suitably located and easily reached, it must be marked as the disconnecting device for the equipment.

⚠️ **Warning**
The power must be achieved by a transformer in which the primary windings are separated from the secondary windings by REINFORCED INSULATION, DOUBLE INSULATION, or a screen connected to the PROTECTIVE CONDUCTOR TERMINAL.

⚠️ **Warning**
It is required the installation of a fuse as overcurrent protection, it has to be positioned between the system and the secondary of the transformer in the installation with the following characteristics: V>= 30Vac, Imax=5.0A (ES. 5x20 5.0A)

Environmental conditions
- Indoor use only;
- temperature from 5°C to 40°C;
- maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C;
- mains supply voltage fluctuations up to ±10% of the nominal voltage.

3.1.1. Performance flow rate characteristics

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

FLOW RATE VS PRESSURE DROP
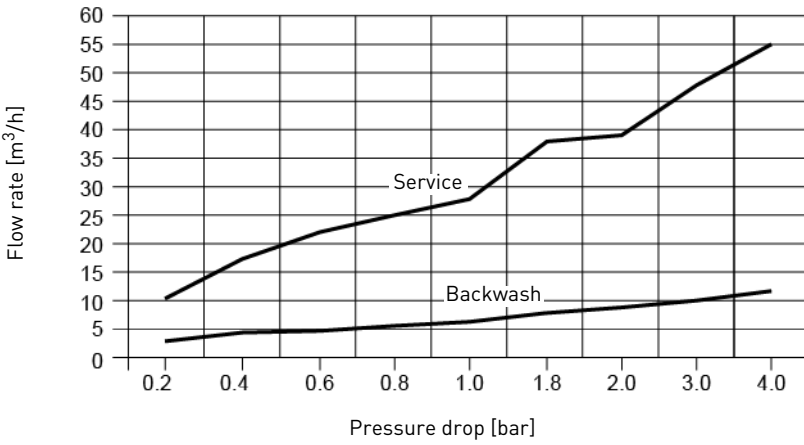
3.2. Outline drawing

3.3. Components description and location

Upper power head

Injector

Brine valve

Lower power head

Brine valve switch

Upper power head motor

Upper piston switch

Upper piston

NXT controller

Upper piston cam

Brine valve cam

Lower piston cam

Lower piston

Lower piston switch

Lower power head motor

Status LED

Diagnostic button

Setting button

Shift button
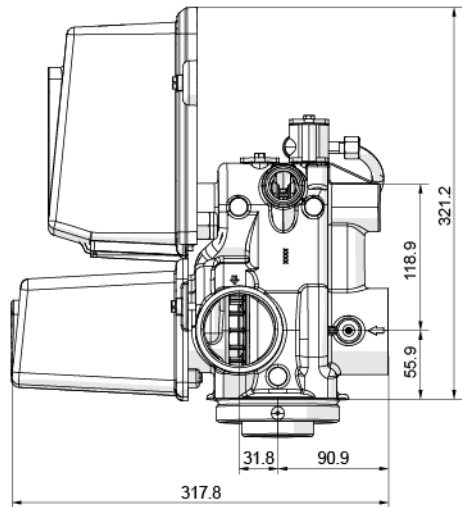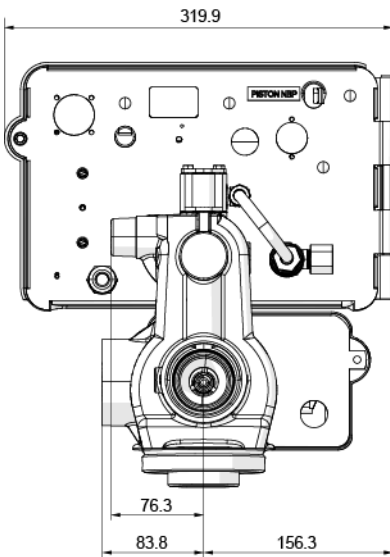
Regeneration button
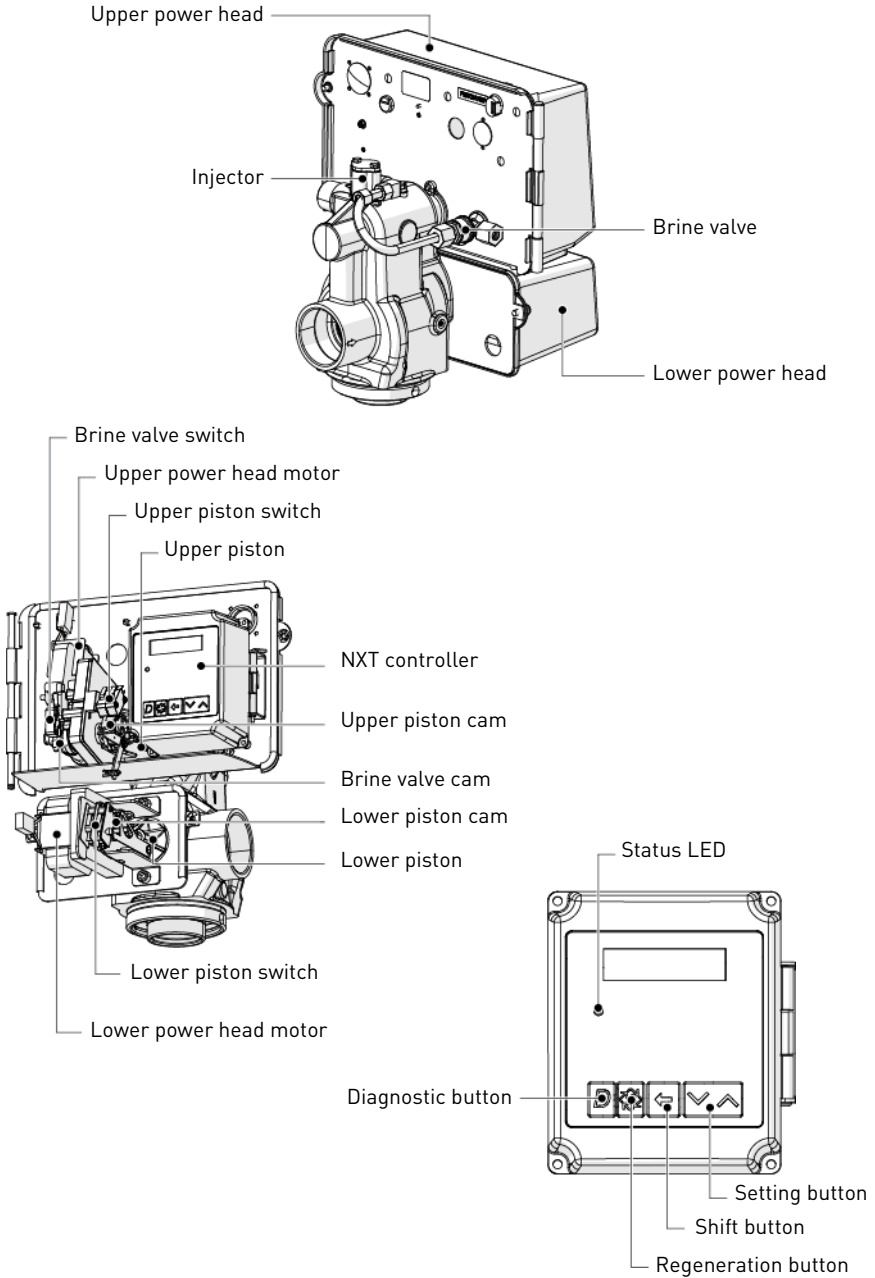
3.4. System regeneration cycle

> **Note**
> This valve allows DF and UF regenerations.

3.4.1. DF regeneration cycle (5-cycles operation)

Service — normal use

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 by sodium ions. The water is conditioned as it passes through the resin bed.

Backwash — cycle C1

The flow of water is reversed by the 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 & slow rinse — cycles 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 on the resin beads are replaced by sodium ions and are sent to the drain. The resin is regenerated during the brine cycle. When the air check valve closes brine drawing finishes, and then the slow rinse phase starts.

Rapid rinse — cycle C3

The valve 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 re-compacted.

Brine tank refill — cycle C4

Water is directed to the brine tank, at a rate controlled by the refill controller, to create brine for the next regeneration. During brine refill, treated water is already available at the valve outlet.

Pause & Delay — cycle C5

The valve is in stand-by until the end of the cycle.

> **Note**
> The cycle Pause & Delay is optional with NXT controller. The factory value is set to 0 minute.

Note

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

SERVICE
NORMAL USE

C1
BACKWASH

C2
BRINE DRAW & SLOW RINSE

C3
RAPID RINSE

C4
BRINE TANK REFILL

C5
PAUSE & DELAY
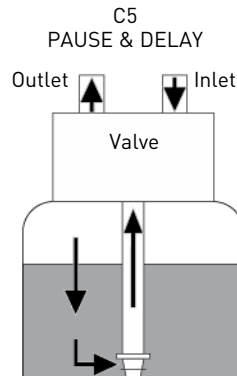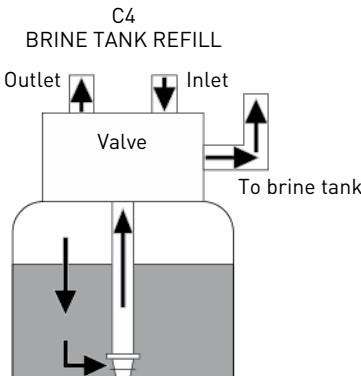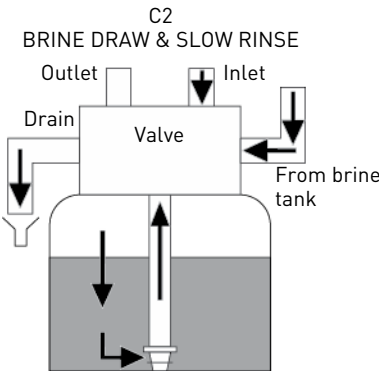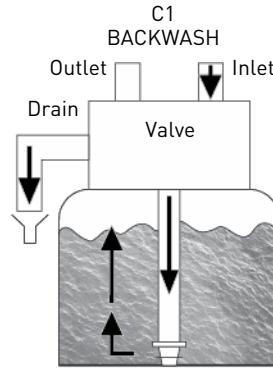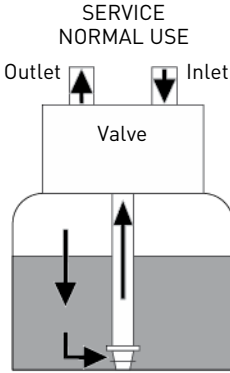
3.4.2. UF regeneration cycle (5-cycles operation)

Service — normal use

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 by sodium ions. The water is conditioned as it passes through the resin bed.

Pause & Delay — cycle C1

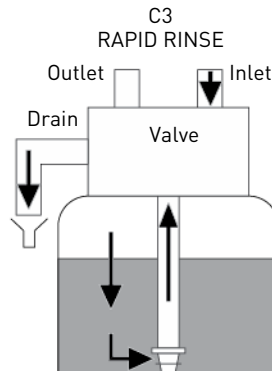The valve is in stand-by until the end of the cycle.

> **i** **Note**
> The cycle Pause & Delay is optional with NXT controller. The factory value is set to 0 minute.

Brine draw & slow rinse — 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 riser tube and up through the resin bed to the drain. The hardness ions are replaced by sodium ions and are sent to the drain. The resin is regenerated during the brine cycle. Then the slow rinse phase starts.

Backwash — cycle C3

The flow of water is reversed by the 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.

Rapid 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 re-compacted.

Brine tank refill — cycle C5

Water is directed to the brine tank, at a rate controlled by the refill controller, to create brine for the next regeneration. During brine refill, treated water is already available at the valve outlet.

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

C1
PAUSE & DELAY

Outlet   Inlet

Valve

C2
BRINE DRAW & SLOW RINSE

Outlet   Inlet

Drain   Valve

From brine tank

C3
BACKWASH

Outlet   Inlet

Drain   Valve

C4
RAPID RINSE

Outlet   Inlet

Drain   Valve

To brine tank

C5
BRINE TANK REFILL

Outlet   Inlet

Valve

To brine tank

SERVICE
NORMAL USE

Outlet   Inlet
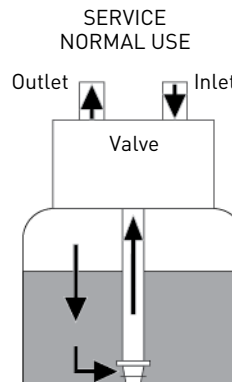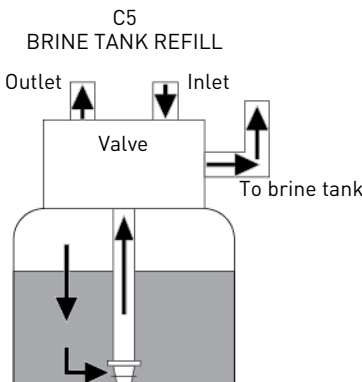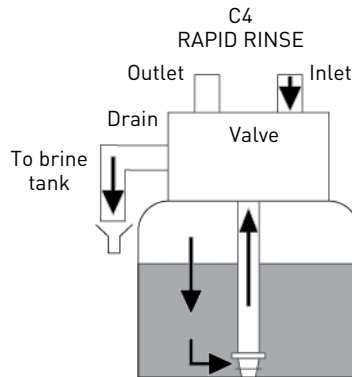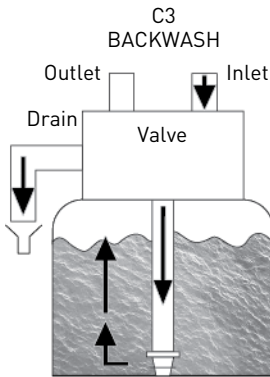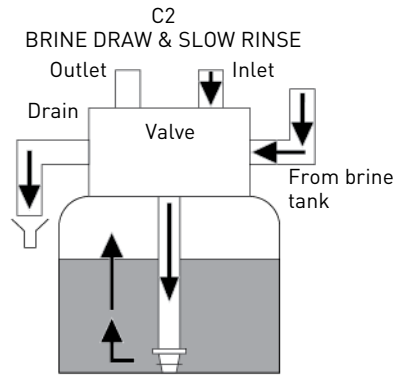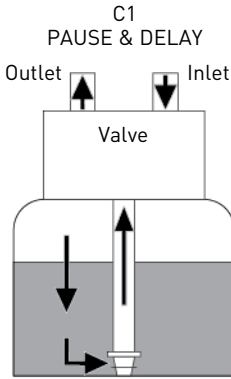
Valve

3.5. Injector block position for DF and UF configurations

DF
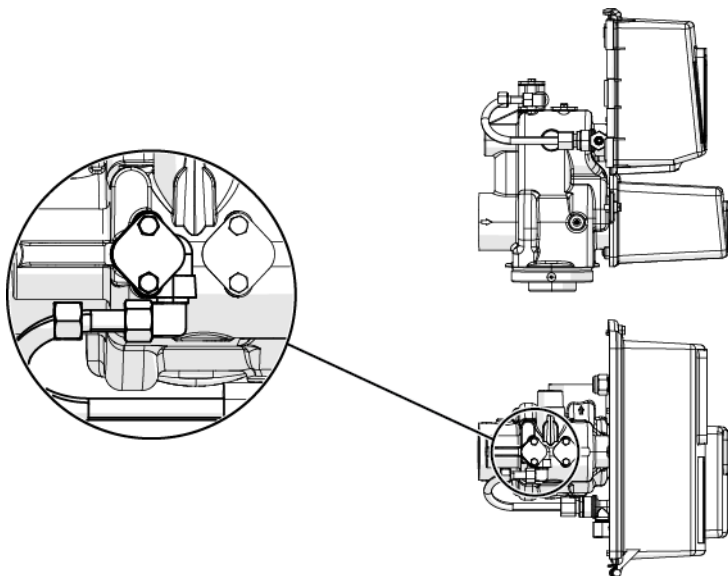
UF
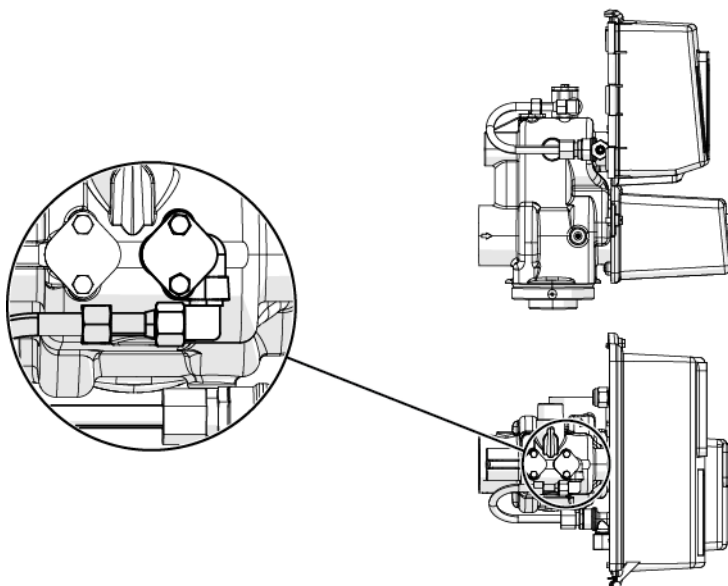
4. System sizing

4.1. Recommendations

4.1.1. Injector/DLFC/BLFC-Valve configuration

Brine syst.	Diameter	Resin volume	Injector				DLFC	BLFC	
	[in]	L	DF	Color	UF	Color	[gpm]	DF [gpm]	UF [gpm]
1600/ 1650	14	60 –85	3	Yellow	2	Blue	5.0	1.0	1.0
	16	85 - 115	N/A	N/A	3	Yellow	7.0	N/A	1.0
1700/ 1710	16	85 - 115	3C	Yellow	N/A	N/A	7.0	1.2	N/A
	18	150 - 165	3C	Yellow	3C	Yellow	10.0	2.0	2.0
	21	115 - 200	4C	Green	3C	Yellow	10.0	2.0	2.0
	22	115 - 200	4C	Green	4C	Green	12.0	2.0	2.0
	24	200 - 285	5C	White	4C	Green	15.0	2.0	2.0
	30	285 - 425	6C	Red	5C	White	25.0	4.0	4.0
	36	425 - 525	7C	Black	6C	Red	30.0	5.0	5.0
	36	500 - 600	7C	Black	6C	Red	30.0	7.0	7.0

4.2. Sizing a softener (single unit)

4.2.1. Parameters 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.

i **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 must 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	25	5.73
1.25	32	8.69
1.5	40	13.57
2.0	50	21.20
2.5	63	34.2
3.0	75	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.

> **ℹ 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 a softener can produce 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 to determine the tank you need. Note that at least a third of the total volume of the tank must be 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 that should not be confused. The resin exchange capacity is the amount of Ca^{2+} and Mg^{2+} that can be retained by 1 litre of resin, 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, you can determine the exchange capacity of the unit. The capacity of the unit can be expressed in different ways:

* 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 litres;
* the combined capacity, which represents the volume of water that could 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 resin exchange capacity will depend on the amount of salt to be injected into the resin bed during the regeneration. This amount of salt is given in grams per litre of resin. The next table is showing the resin exchange capacity in function of the amount of salt for a system with standard efficiency regeneration.

Resin exchange capacity as a function of the salt dosage:

Salt amount [g/L_resin]	Corresponding resin exchange capacity in [g/L_resin] as CaCO_3	°f.m^3 [per L_resin]	°dH.m^3 [per L_resin]
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:

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

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 [g as CaCO$_3$]
$C_{capacity}$: system combined capacity [°f.m^3 or °dH.m^3]
TH_{inlet}: inlet water hardness [mg/L as CaCO$_3$ or °f or °dH]

⚠️ **Caution**
If a mixing device is set on the valve, TH = TH$_{INLET}$ - TH$_{OUTLET}$.

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 slow rinse 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: Tank$_{cross\ section\ area}$ [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 4 BV / 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 at the inlet pressure in order to check if the injector will give a correct flow rate. See chapters 4.3. Salt amount definition, page 30 and 4.4. Injector flow rates (tables & graphics), page 30.

4.2.5. Cycle time calculation

From this point, the volume of resin, the tank size, the capacity of the softener and the valve configuration are determined. Next step is to calculate the regeneration cycle duration, 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 specifications for the velocity for backwashing the resin bed;
- the velocity of water for brine draw, slow rinse and fast rinse.

Further information needed for cycle time calculation are:
- the resin volume previously determined;
- the salt amount used per regeneration;
- the volume of water to use for backwash, brine draw, slow rinse and fast rinse.

To calculate the backwash duration:

$$T_{backwash} = (N_{BVbw} \times BV) / Q_{DLFC}$$

with:
$T_{backwash}$: backwash duration [min]
N_{BVbw}: number of bed volume for backwash
BV: bed volume [L]
Q_{DLFC}: drain line flow controller size [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 draw flow rate at the working pressure:

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

> with:
> $T_{brine\ draw}$: brine draw duration [min]
> V_{brine}: brine volume to be drawn [L], see Refill calculation page 30
> Q_{draw}: injection draw flow rate [L/min]

> **ℹ Note**
> Multiply the amount of salt in kg by 3 to get a 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.

$$T_{slow\ rinse} = (N_{BVsr}\ x\ BV) / Q_{SR}$$

> with:
> $T_{slow\ rinse}$: slow rinse duration [min]
> N_{BVsr}: number of bed volume for slow rinse
> 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.

$$T_{fast\ rinse} = (N_{BVfr}\ x\ BV) / Q_{DLFC}$$

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

To calculate the refill duration:

The refill flow rate is controlled by the refill controller (BLFC). The relation between the BLFC size, the tank size and the resin volume is given in the valve specifications.

To calculate the refill duration:

$T_{refill} = V_{WB} / Q_{BLFC}$

with:
T_{refill}: refill duration [min]
V_{WB}: Volume of water to be refill to prepare the brine [L]
Q_{BLFC}: BLFC size [L/min]

$V_{WB} = D_{Salt} \times BV / S_{sol}$

with:
V_{WB}: Volume of water to be refill to prepare the brine [L]
D_{Salt}: Salt dosage per litre of resin [g/L]
BV: Bed volume [L]
S_{sol}: 360g/L - Solubility of salt per litre of water

Note

When calculating the time required to draw the brine, take into account that the volume of brine [V_{brine}] will be 1.125 bigger than the volume of water refilled.

4.3. Salt amount definition

The salt settings is done through the controller programming.

4.4. Injector flow rates (tables & graphics)

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

4.4.1. 1600 Injectors

INJECTOR 2
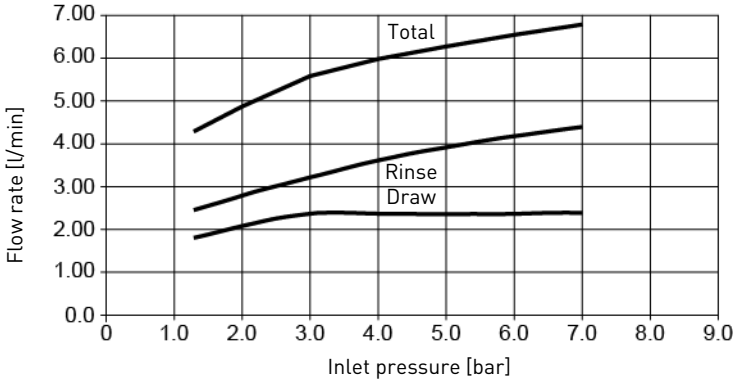
INJECTOR 3

4.4.2. 1650 injectors

INJECTOR 2

INJECTOR 3

4.4.3. 1700 injectors

INJECTOR 3C

INJECTOR 4C

INJECTOR 5C

4.4.4. 1710 injectors

INJECTOR 6C

INJECTOR 7C

5. Installation

> **Mandatory**
> It is strictly forbidden for not qualified personal, to accede to system's internal parts to perform any kind of technical action. <u>Be sure t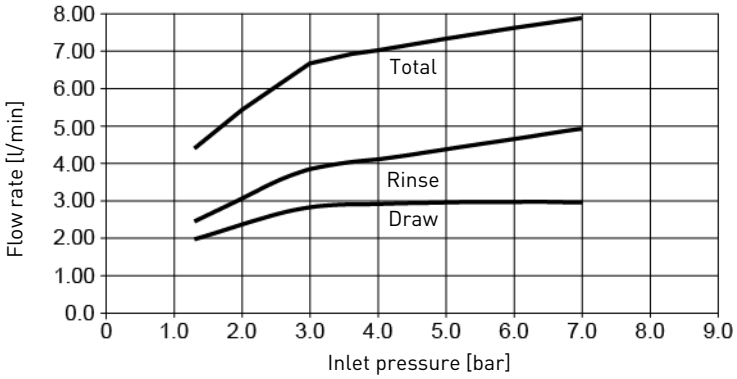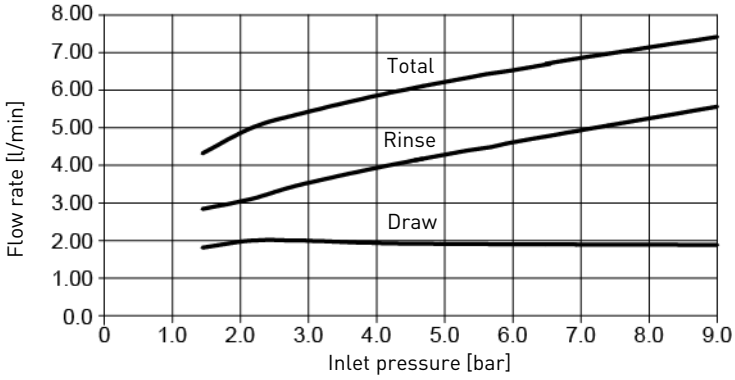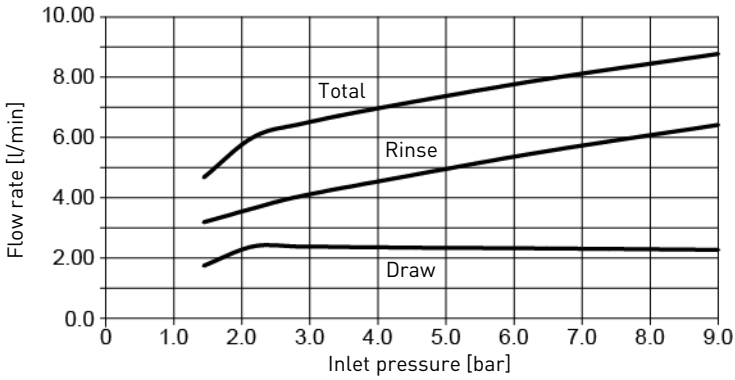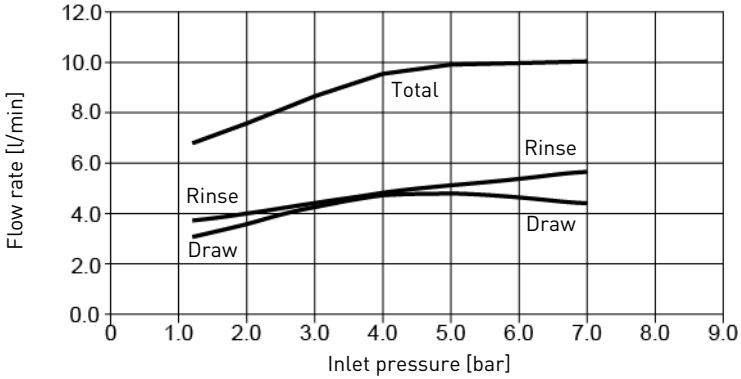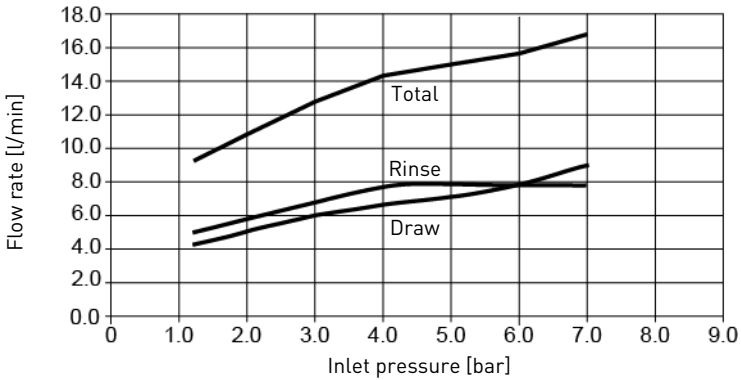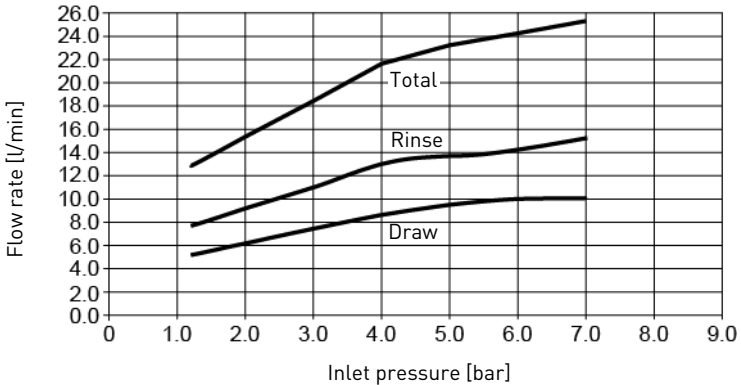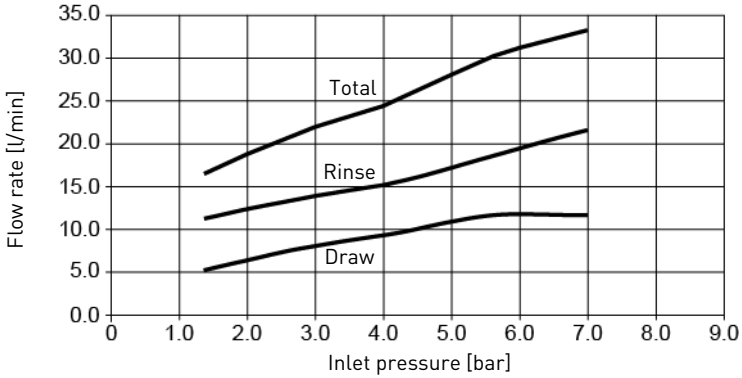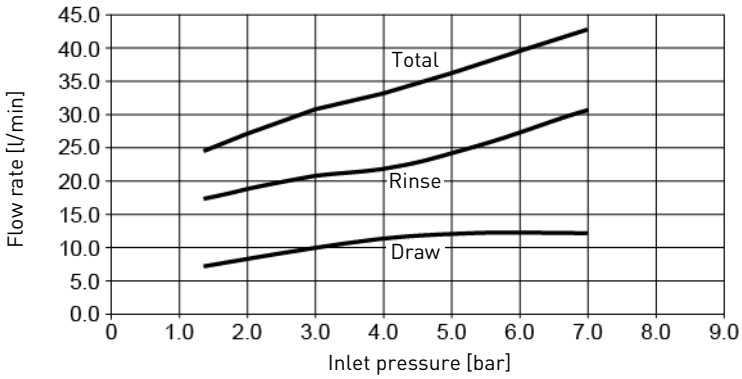o disconnect the electrical power, close the water inlet and depressurize the system before opening the front cover to access internal parts.</u>

5.1. Warnings

The manufacturer will not be held liable for any damages to people or properties resulting from an improper use of the device not compliant with the following instructions.

Whenever this guide doesn't clarify all doubts about installation, service or maintenance, please contact the technical support of the company that has installed the device.

Device installation must be done by a qualified technician according to the current standards and regulations, using tools compliant with a device for a safety use and referring to that technician also for device maintenance.

In case of out of order or malfunction, before performing any kind of action on the device, please ensure to have disconnected the transformer from the power source, to shut off inlet water supply to the valve and to drain water pressure opening a tap down-line of the valve.

1. Be careful when removing the valve from the box and during subsequent handling, weight is liable to cause damage to property and persons in case of accidental impact.
2. Before sending the water on the valve, make sure that all plumbing connections are tight and properly implemented in order to avoid dangerous leaks of pressurized water.
3. Use caution when installing welded metal piping near the valve, the heat may damage the plastic body of the valve and the bypass.
4. Be careful not to let the full weight of the valve on fittings, pipes or bypass.
5. Make sure that the environment in which the valve is installed does not reach freezing temperatures of the water, the valve may be damaged.
6. Make sure that the tank containing the resin is vertical, otherwise the resin could enter in the valve and damage it.

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. General

- Use only brine salts designed for water softening. Do not use ice melt, block, or rock salts;
- keep the media tank in an upright position. Do not turn on its side, upside down, or drop it. Turning the tank upside down may cause media to enter the valve or might clog 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 the media tank, first place the valve in the backwash position, then partly open the valve. Fill the tank slowly to prevent media from exiting the tank;
- when installing the water connection (bypass or manifold), first connect to the plumbing system. 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.

5.3.2. Water

- Water temperature must not exceed 43°C for standard, 65°C for volumetric and 82°C for time clock;
- a minimum of 1.8 bar of water pressure is required for the regeneration valve to operate effectively.

> **Mandatory**
> Do not exceed a maximum of 8.6 bar inlet pressure. In such cases, it is necessary to install a pressure regulator upstream the system.

5.3.3. Electrical

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

- All electrical connections must be completed according to local codes;
- use only the power AC transformer that is supplied;

> **Mandatory**
> The use of any other power transformer than the one supplied void the warranty of all electronic parts of the valve.

- the power outlet must be grounded;
- to disconnect power, unplug the AC transformer from its power source;
- an uninterrupted current supply is required. Please make sure that the voltage supply is compatible with the unit before installation;
- make sure the controller power source is plugged in;
- if the electrical cable is damaged, it is imperative that it is replaced by a qualified personnel.

5.3.4. Mechanical

• Do not use petroleum-based 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;
• existing plumbing should be in a good shape and free from limescale. In case of doubt, it is preferable to replace it;
• all plumbing must be completed according to local codes and installed without tension or bending stresses;
• 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;
• do not use lead-based solder for sweat solder connections;
• the riser tube should be cut 6 to 19 mm below the top of the tank. Slightly bevel the ridge in order to avoid deterioration of the seal whilst fitting the valve;
• the drain line must be a minimum of 25.4 mm (1") in diameter;
• do not support the weight of the system on the 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 drain elbow, the drain line connections, and other NPT/BSP threads;
• the installation of a pre filter is always recommended (100µ nominal);
• valve inlet/outlet must be connected to main piping via flexible.

5.4. Integration constraints

Location of a water treatment system is important. The following conditions are required:
• flat and firm level platform or floor;
• room to access equipment for maintenance and adding brine (salt) to tank;
• constant electrical supply to operate the controller;
• total minimum pipe run to water heater of 3 m (10 ft) to prevent backup of HW into system;
• always install check valve before water heater to protect the softener from HW 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 site of installation;
• valve is designed for minor plumbing misalignments. Do not support weight of system on the plumbing;
• be sure all soldered pipes are fully cooled before attaching plastic valve to the plumbing.

5.5.   Valve connection to piping

The connections should be hand tightened using PTFE (plumber's tape) on the threads if using the threaded connection type.

In case of heat welding (metal type connection), the connections should not be made to the valve when soldering.

> **ℹ Note**
> See chapter 3.3. Components description and location, page 17 to identify the connections.

When pressurized, any composite tank will expand both vertically and circumferential. In order to compensate the vertical expansion, the piping connections to the valve must be flexible enough to avoid overstress on the valve and tank.

5.5.1. Top-mounted valve installation

The valve and tank should not be supporting any part of the piping weight. This is hence compulsory to have the piping fixed to a rigid structure (e.g. frame, skid, wall...) so that the weight of it is not applying any stress on the valve and tank.
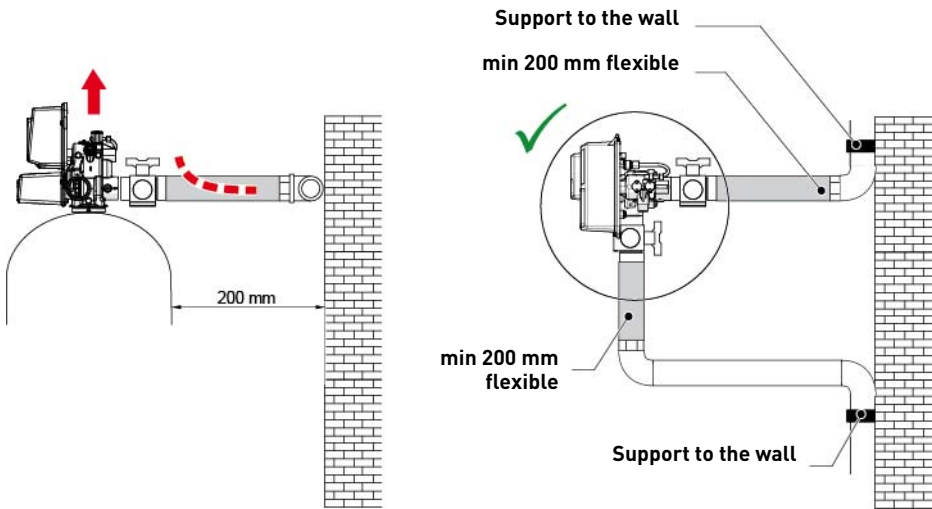
- The diagrams above illustrate how the flexible piping connection should be mounted;
- in order to adequately compensate the tank elongation the flexible tubes must be installed horizontally;
- should the flexible piping connection be installed in vertical position, instead of compensating the elongation, it will create additional stresses on the valve & tank assembly. Therefore this is to be avoided;
- the flexible piping connection must be also be installed stretched, avoiding excessive length. For instance 20 - 40 cm is enough;
- excessively long and non-stretched flexible piping connection will create stresses on the valve and tank assembly when the system is pressurized, as illustrated in the below picture: on the left the assembly when the system is unpressurised, on the right the flexible piping connection when put under pressure tends to lift up the valve when stretching up. This configuration is even more dramatic when using semi-flexible piping;
- failure to provide enough vertical compensation may lead to different kinds of damage, either on the valve thread which connects to the tank, or on the female thread connection of the tank that connects to the valve. In some cases, damage may also be seen on the valve inlet and outlet connections;


- in any case, any failure caused by improper installation and/or piping connections may void the warranty of Pentair products;
- in the same way, using lubricant* on the valve thread is not allowed and will void the warranty for the valve and tank. Indeed using lubricant there will cause the valve to be over-torqued, which may lead to valve thread or tank thread damage even if the connection to piping has been done following the above procedure.

*Note: Use of petroleum-based grease and mineral based lubricant is totally forbidden, not only on the valve thread, since plastics (especially Noryl) will highly suffer from contact with this type of grease, leading into structural damage hence to potential failures.

5.5.2. Side-mounted valve installation

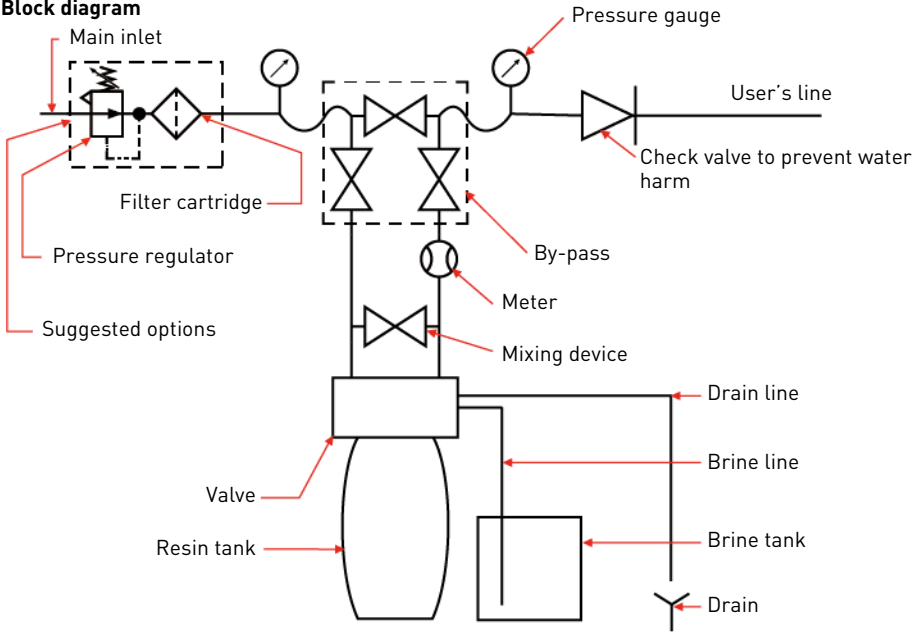Valid for location having a reduced height.
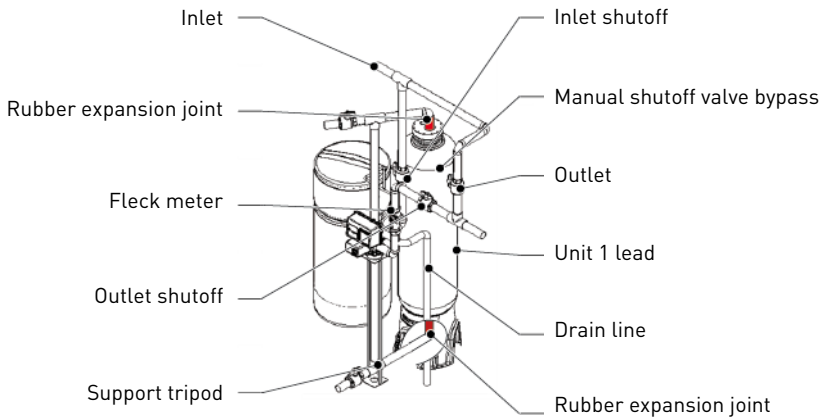
- To avoid the piping supporting the valve and side adapter weight, they must be fixed on a tripod or any other appropriate support;
- in order to adequately compensate the tank elongation, the rubber expansion joints must be mounted on the top and bottom of the tank. In red on the diagram above.

5.6. Block diagram and configuration example

Block diagram

Main inlet
Pressure gauge
User's line
Check valve to prevent water harm
Filter cartridge
By-pass
Pressure regulator
Meter
Mixing device
Suggested options
Drain line
Brine line
Valve
Brine tank
Resin tank
Drain

Configuration example

V291NC-03
60067-03
18404
18168
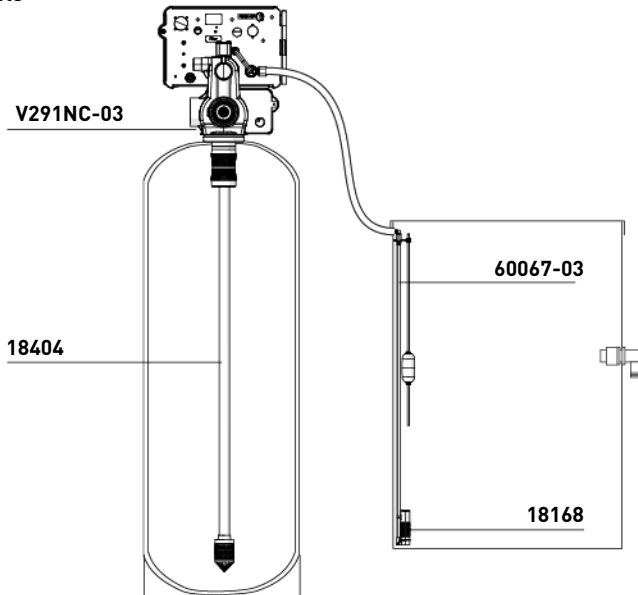
5.7. System types

> **Note**
> For all multiple tank systems, NBP version valves must be used.

Metered immediate:
The controller monitors the volume of water used. Once it calculates that capacity is exhausted, it starts regeneration immediately.

Metered delayed:
The controller monitors the volume of water used. Once, at a preset time, it calculates that there is not enough capacity for the next days of operation, a regeneration cycle will be initiated at a preset time.

Time clock:
The controller will regenerate based on a set time of operation days at a preset time.

Remote regen start
The controller will get a signal from a separate device to start the regeneration.

5.7.1. Single valve (System #4)

As named, this system works with only one valve. The regen can be initiated upon the treated volume (delayed or immediate), time clock or an external remote regen signal.
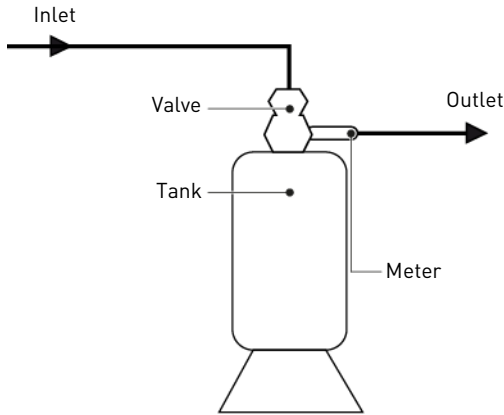
5.7.2. Multiple valves with lockout (System #5)

This system works with 2 to 4 valves.

All tanks in parallel are supplying treated water. Each unit in the system has its own flow meter. The controller will delay the start of regeneration if another unit is already regenerating. Once that unit has completed a regeneration cycle and returned to service, the unit with longest regeneration queue time will begin regeneration. Only one unit regenerates at the time.The regen can be trigged on a volumetric or remote signal.
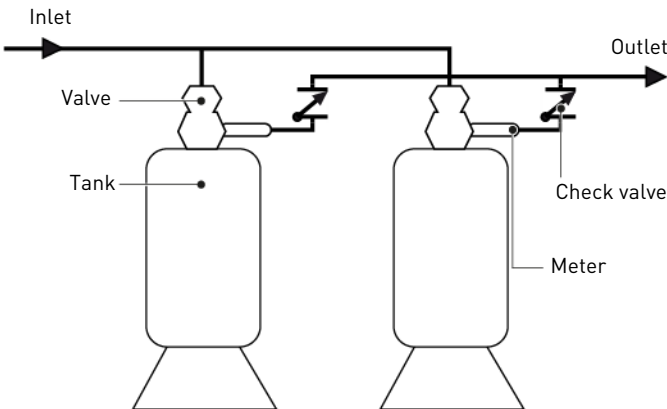
5.7.3. Multiple valves with consecutive regenerations (System #6)

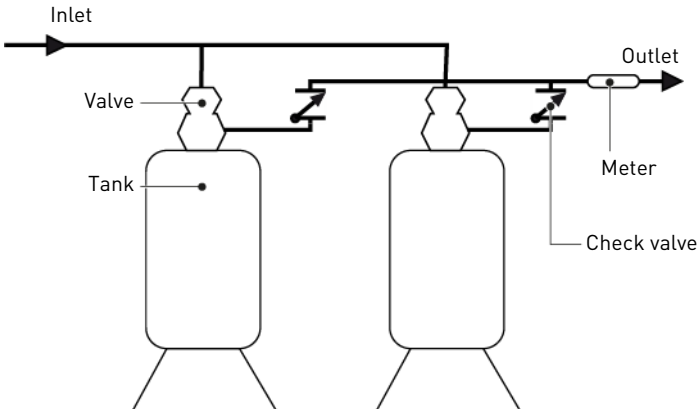This system works with 2 to 4 valves and a meter.

During normal operation, the controllers of each valve display the time of day and the volume of water remaining. The remaining volume is the total volume of the system. The remaining volume displayed drops with water consumption to reach zero. When this happens, if no other valve is regenerating, the master valve sends a locking signal and starts regenerating. If another valve is regenerating, the valve will stay in service until the other goes back in service. As soon as the lead valve finishes its regeneration cycle, the second valve starts regenerating, then the third and the fourth if applicable. A manual regeneration can only be done on the lead valve and only if the others are not regenerating. The regen can be trigged on a volumetric or remote signal.
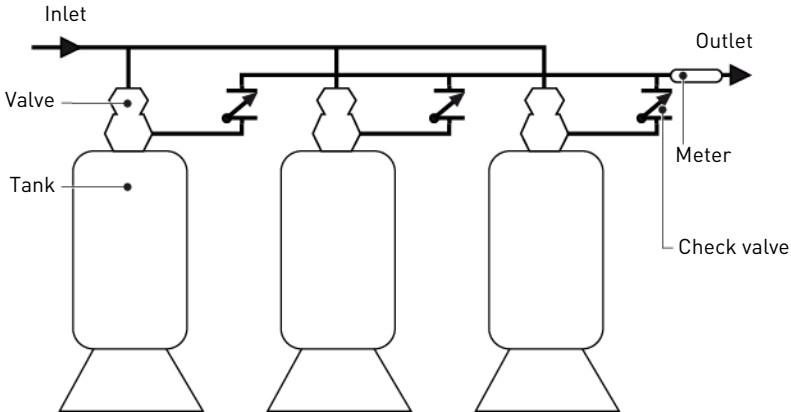
5.7.4. Duplex alternating (System #7)

This system works with 2 valves and a meter.

During normal operation, the controllers of each valve display the time of day and the volume of water remaining. The remaining volume displayed drops with water consumption to reach zero. When this happens, the regeneration starts immediately. The valve in service sends a signal to the valve in standby that goes in service. Once this occurs, the first valve goes in regeneration.

5.7.5. Multiple valves, alternating (System #9)

This system works with 2 to 4 valves.

One, two or three tanks online supplying treated water, one tank in standby. Each unit in the system has its own flow meter. The regeneration of a unit will begin after the other controller has left standby and returned to service. When the regeneration cycle is complete, the regenerated unit will enter in standby. Standby on each tank is controlled by the drive output terminals (24VAC, see UDM on chapter 5.9. Electrical connections, page 50) on the NXT circuit board.
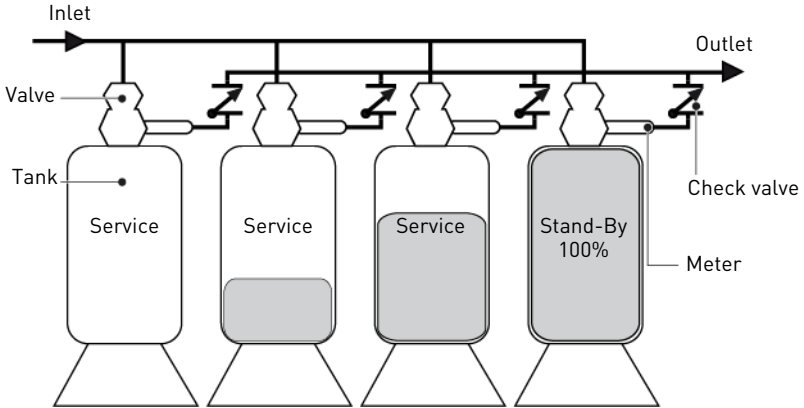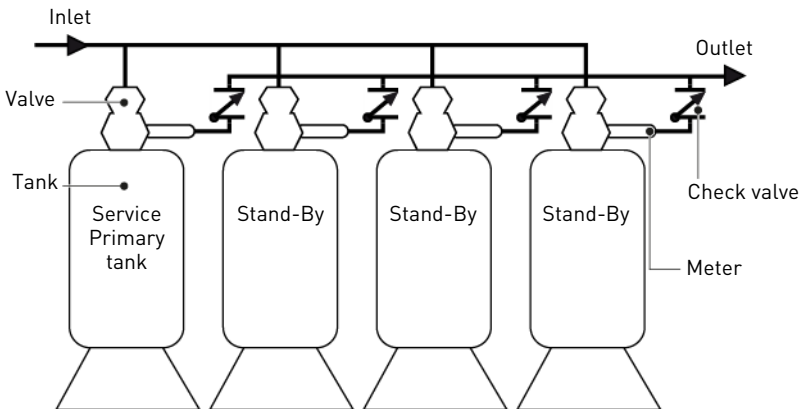

5.7.6. Multiple valves, demand (System #14)

This system works with 2 to 4 valves and operates as part of a multi-tank regeneration system. Each tank in the system must have a flow meter.

The number of tanks in service depends on the flow rate.

5.7.6.1 Examples of a four units system
1. One tank is in service at all time (the "primary tank").

2. The total flow rate to the primary tank increase past the first trip point programmed rate. The flow rate demand stays past the trip point for the preset delayed time. The next tank (least volume remaining) changes from standby to in service. This then splits the total flow between two meters.
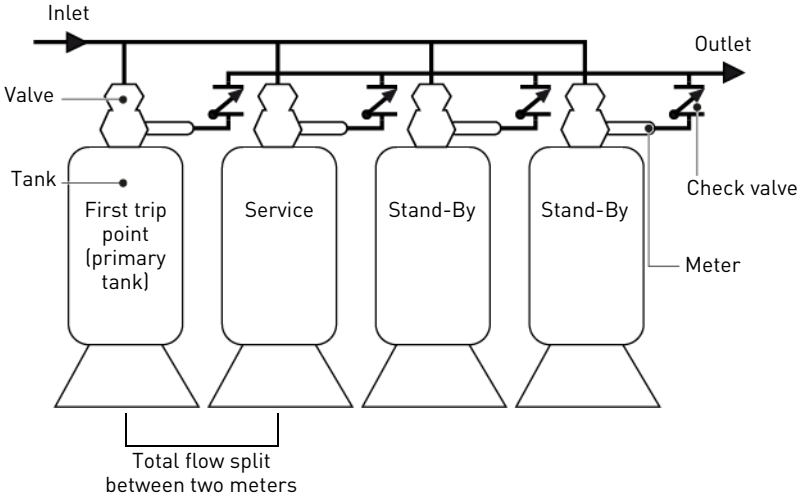
3. The flow rate demand decreased below the first trip point. The tank returns to standby.
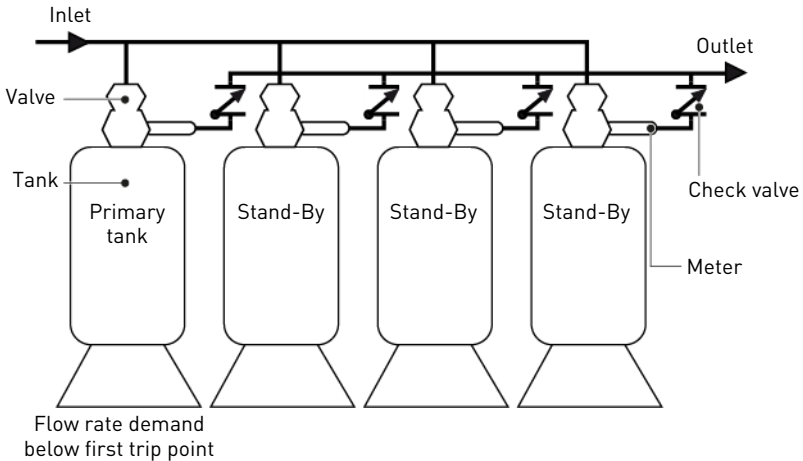
4. Total flow rate demand increased past a second trip point programmed rate. The second and third tank (least volume remaining) changes from standby to service. The total flow is split between three meters.

Flow split between three meters
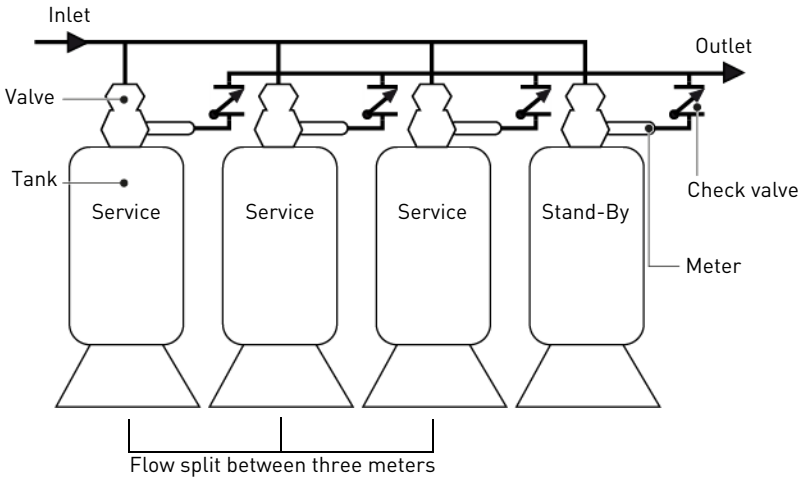
5. The third tank returns to standby as demand decreases past the second trip point.

Flow split between two meters
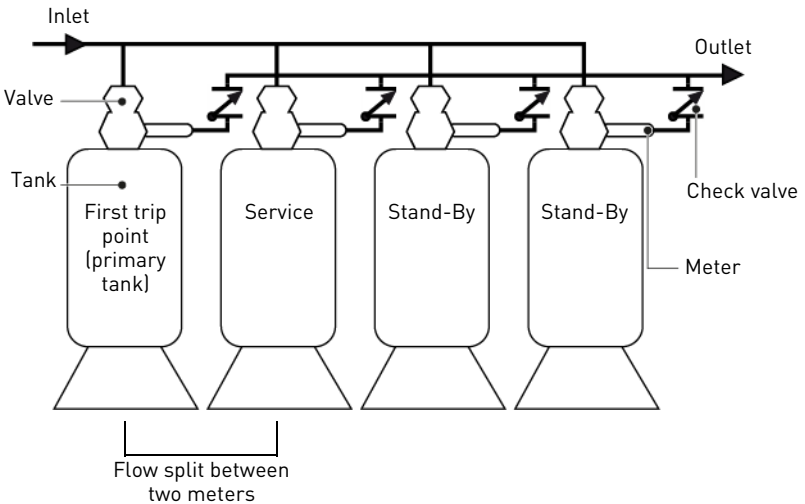
6. Tanks return to standby due to decreased total flow rate and trip points programmed. The tank with the most remaining volume will be the first to go into standby.
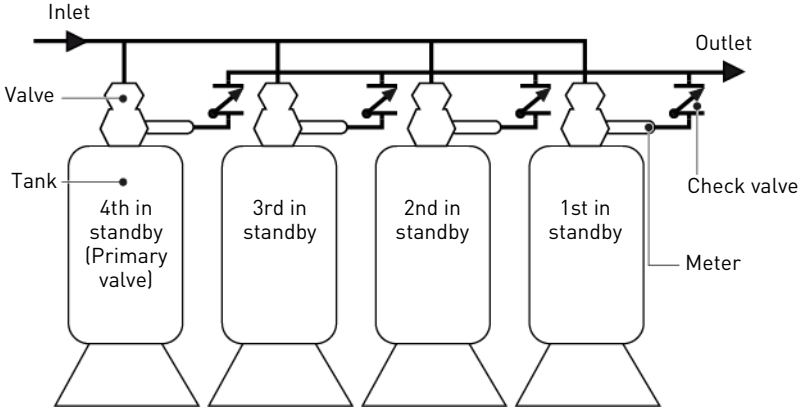
7. The primary tank regenerates when its remaining volume becomes zero. The next tank with the least remaining volume becomes the new primary tank. The tank with the next least volume remaining will be the first to be activated when the flow rate reach the programmed trip point. Tanks continue operating in this order.

5.7.6.2 System operation in regeneration
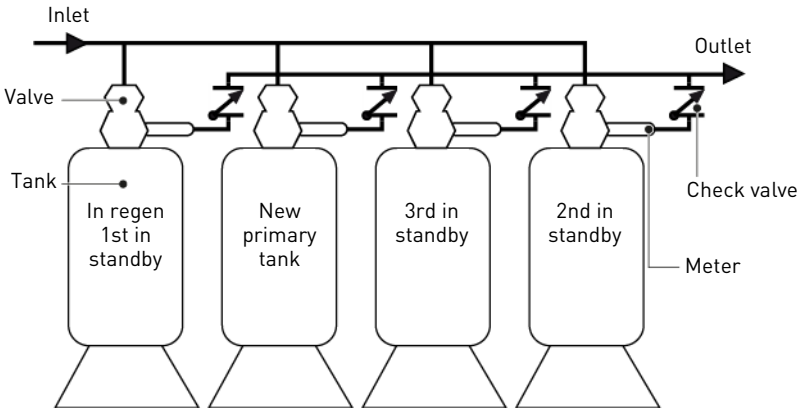
If two tanks are in service and both reach Volume remaining = 0, the other two tanks will shift from standby into service. The lead tank with Volume remaining = 0 will start regeneration. The second tank with Volume remaining = 0 will enter into standby. If the flow increases past the trip point, a third tank needs to enter in service. The tank in standby with Volume remaining = 0 will shift into service to maintain a steady flow. Operating for extended periods in this mode may degrade the water quality.

5.8.   Valve connection to piping

The connections should be sealed using PTFE (plumber's tape) on the threads if using the threaded connection type.
In case of heat welding (metal type connection), the connections should not be made to the valve when soldering.

Note
See chapter 3.3. Components description and location, page 17 to identify the connections.

5.9. Electrical connections
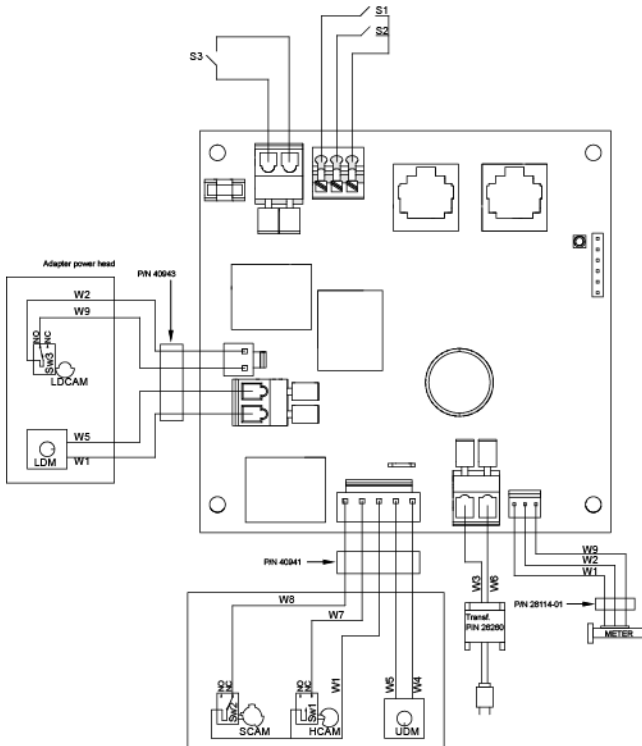
W1:	Black	W8:	Violet	HCAM:	Upper piston cam
W2:	Red	W9:	Green	LDM:	Lower power head motor
W3:	Brown	S1:	Inhibition signal	UDM:	Upper power head motor
W4:	Yellow	S2:	Remote regen signal start	Sw1:	Upper piston switch
W5:	White	S3:	External signal during service	Sw2:	Brine valve switch
W6:	Blue	LDCAM:	Lower piston cam	Sw3:	Lower piston switch
W7:	Orange	SCAM:	Brine valve cam		

5.9.1. Connections for multiple valves

2 controllers NXT
Duplex system #5, #6, #7, #9 & #14
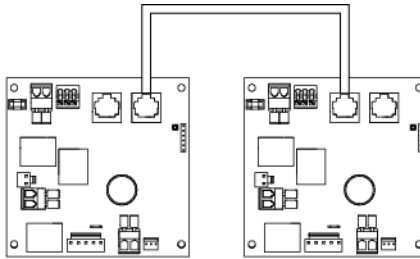
3 controllers NXT
Triplex system #5, #6, #9 & #14
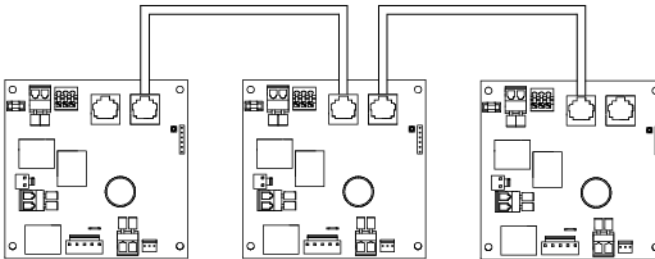
4 controllers NXT
Quadriplex system #5, #6, #9 & #14
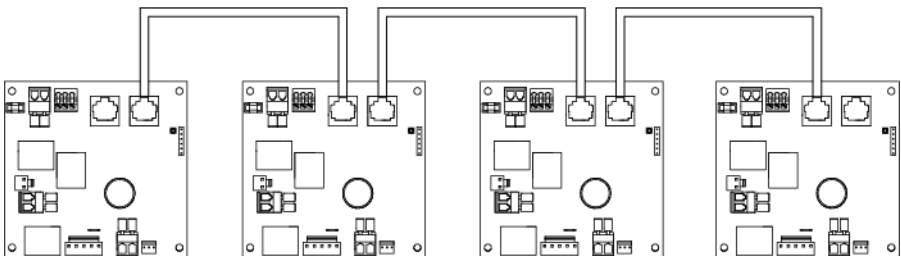
5.10. Bypassing

A bypass valve system should be installed on all water conditioning systems. Bypass valves isolate the softener from the water system and allow unconditioned water to be used. Service or routine maintenance procedures may also require that the system is bypassed.
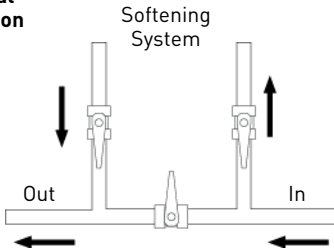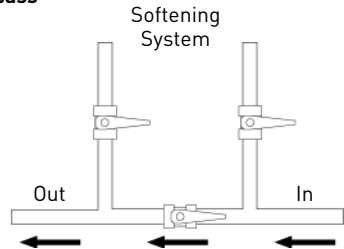
Caution
Do not solder pipes with lead-based solder.

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 valve. Non-silicone grease may cause plastic components to fail over time.

5.11. 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.

Mandatory
The drain line must be build with 1" PVC rigid tube with an air gap must be present at the drain.

Caution
Flexible and semi-flexible hoses may bend and whip during draining.

The drain line must be build with 1" PVC rigid tube with an air gap.

The drain line may be elevated up to 1.8 m providing the run does not exceed 4.6 m and water pressure at the softener is not less than 2.76 bar. Elevation can increase by 61 cm) for each additional 0.69 bar of water pressure at the drain connector.

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 50.8 mm (2"), 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 waste water to prevent the possibility of sewage being back-siphoned into the softener.

Air gap
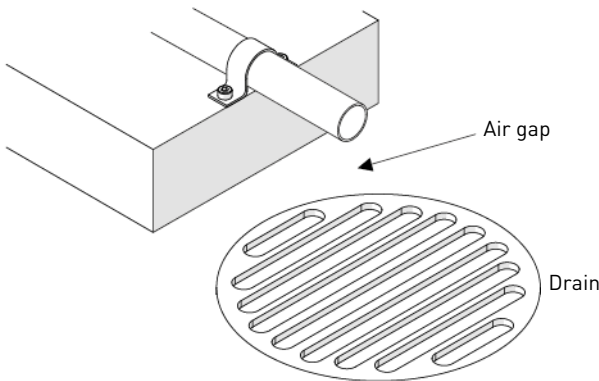
Drain

5.12. 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 brine tank. Most tank manufacturers include a post for the tank overflow connector.

To connect the overflow line, locate the hole on the side of the tank. Insert the overflow fitting into the tank and tighten with plastic thumb nut and gasket as shown below. Attach a 25.4 mm (1") I.D. tubing (not supplied) to fitting and run to drain.

Do not elevate overflow higher than overflow fitting.

Do not tie into the drain line of the controller unit. The 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.
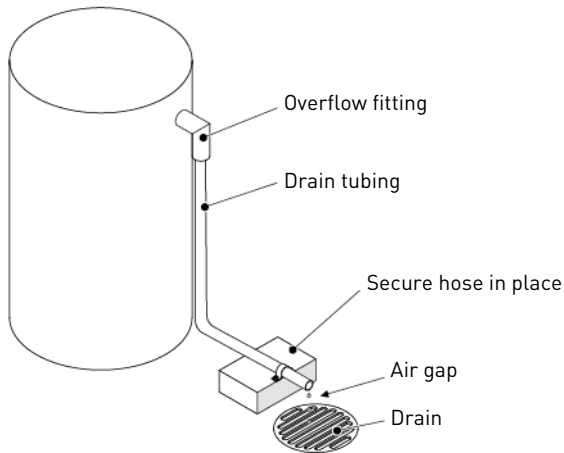
> **Caution**
> Floor drain is always recommended to avoid flooding in case of overflow.

5.13. Brine line connection

> **Mandatory**
> The brine line must be build with 1" PVC rigid tube.
>
> **Caution**
> Flexible and semi-flexible hoses may shrink because of the vacuum during brine draw.

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 softener will not draw brine from the tank. This may also introduce air into the valve, causing problems with the valve operation.
Most installations utilize a tank check valve.

6. Programming

6.1. Display

6.1.1. During service

```
        1   2   3   4     5

        ┌─────────────────────┐
        │7#1  SRV*  08:26HR    │
6 ──────│VOLUME      20000L    │
        └─────────────────────┘
```

1. System type   → #4: single valve;
                      → #5: lockout system, 2 to 4 valves;
                      → #6: parallel system, sequential regenerations, 2 to 4 valves;
                      → #7: duplex alternating system, 2 valves;
                      → #9: alternating system, 2 to 4 valves;
                      → #14: demand system, 2 to 4 valves.
2. Valve address   → #-: single valve;
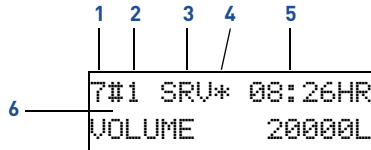   → #1: address 1, lead valve;
                      → #2: address 2;
                      → #3: address 3;
                      → #4: address 4.
3. Valve status   → CHG (change of state): lower drive changes position on double piston valve;
                      → INI (initializing): after a power failure or a change in the programming, the controllers initializes for approximately 30 seconds;
                      → RGQ (regeneration queued): in a meter delayed system, the reserve capacity has been entered or a manual regeneration has been registered;
                      → LCK (lock): the controller has acquired the lockout signal;
                      → SRV (service): valve in service;
                      → SBY (standby): valve in standby.
4. Flow indicator   → rotates when flow is going through the meter.
5. Time of the day
6. Operating mode   → remaining volume in volumetric mode;
                      → remaining days before regeneration in timeclock mode.

6.2. Commands

> **ℹ Note**
> At any time, press D to return to the home screen without saving.

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

A Press ⟳ to pass to the next step.

B Use ⬅ to move the cursor to the next digit.

C Use ⟍ and ⟋ to adjust the values.

D Press D at any time to exit programming mode without saving.

6.3. Setting the time of the day

Set the time in the system.

Mandatory
In multiple valve systems, set the time of day on the lead valve (#1).

Note
The time of day will be automatically updated on the other valves in the system within 10 seconds.

Note
If, during time setting, no buttons are pushed for 5 seconds, the system leaves setting.

A Press ⟍ or ⟋ for 2 seconds.

B Set the controller with ⟍, ⟋ and ⬅ .

C Press ⟳ to validate the selection and return to the service mode.

```
SET TIME OF DAY:
         08:43HR
```
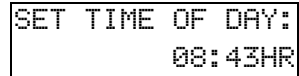
6.4. Basic programming

Note
Menus are displayed in a defined and incremental order.

6.4.1. Language setting

Select the displayed language.

Options:
• English;
• French;
• German;
• Italian;
• Spanish.

A Press ⟍ and ⟋ simultaneously for 5 seconds to enter the menus sequence.

```
SELECT LANGUAGE:
         ENGLISH
```

B Select the language to be displayed with ╲╱ and ╱╲.

C Press ⟳ to validate the selection and advance to the next parameter.

6.4.2. Inlet water hardness

Set the input water hardness in the unit defined on chapter 6.5.11. Display format, page 65.

D Set the inlet water hardness with ╲╱, ╱╲ and ← .

E Press ⟳ to validate the selection and advance to the next parameter.

```
FEED WATER
HARDNESS:0030mgL
```

6.4.3. Regeneration days override

Set the maximum number of days that the valve is in service without regenerating, regardless from the volume of water used.

ℹ️ **Note**
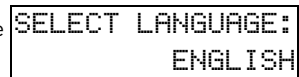For a timeclock valve, this value must be set. For metered valves, it is regenerated once the amount of days is reached at a preset time unless the meter triggers regeneration before. Calendar override initiate regeneration only if no regeneration has been initiated within the delay programmed in calendar override parameter.

F Adjust the number of days with ╲╱, ╱╲ and ← .

G Press ⟳ to validate the selection and advance to the next parameter.
→ Can be adjusted from:

    1 to 99 days for timeclock regeneration;

    OFF to 99 days for metered regeneration.

Without calendar forcing.
```
REGENERATION DAY
OVERRIDE:OFF
```
Forcing every 3 days.
```
REGENERATION DAY
OVERRIDE:03DAYS
```

6.4.4. Regeneration start time

Set the time for regeneration start.

⚠️ **Mandatory**
It must be set when the valve is in timeclock mode or with a metered calendar override.

H Adjust the time of regeneration with ╲╱, ╱╲ and ← .

I Press ⟳ to validate the selection and return to service.

Regeneration at 2:00 am.
```
REGENERATION
TIME    02:00HR
```

6.5. Master programming mode

Note

As soon as programming mode is entered, all parameters can be displayed or set to suit the needs. Depending on the current programming, some functions will not be displayed or will not be changeable.

Note

If none of the buttons are pushed for 5 minutes in the Programming mode, or if there is a power failure, the controller returns to Service mode without saving.

Mandatory

In order to store the new settings in the programming mode, it is necessary to go through all the parameters.

6.5.1. Master programming mode chart

Parameter	Options	Definition	Note
LANGUAGE	ENGLISH	English	
	FRANCAIS	French	
	DEUTSCH	German	
	ITALIANO	Italian	
	ESPANOL	Spanish	
SYSTEM TYPE	4	Single unit	1 unit.
	5	Parallel interlock	2 to 4 units.
	6	Parallel series regeneration	
	7	Alternating	2 units.
	9	Alternating	2 to 4 units.
	14	Multiple demand valves	
VALVE ADDRESS	#1	First control valve	This screen will not be displayed for system type 4.
	#2	Second control valve (default)	
	#3	Third control valve	
	#4	Fourth control valve	

Parameter	Options	Definition	Note
SYSTEM SIZE	2	2 valves in the system	This screen will not be displayed for system type 4.
	3	3 valves in the system	
	4	4 valves in the system	
REGEN TYPE	TIME CLK DELAYED	Time clock delayed (default)	System 4 only.
	METER IMMEDIATE	-	All system types.
	MTR DLY FIX RSV	Metered delayed fixed reserve	Systems 4 & 6 only.
VALVE TYPE	2750	-	
	2850	-	
	2900/2910	-	
	3150	-	
	3900	-	
	STAGER-NOTCH CAM	-	
REGENERANT FLOW	DOWN FLOW	-	
	UP FLOW	-	
REMOTE SIGNAL START	OFF to 99 minutes	-	This screen will not be displayed for system type 14.
DISPLAY FORMAT	US-GALLONS	Imperial units (default)	
	EU-METRIC-LITERS	Metric units	
UNIT CAPACITY	1 to 198'000	Gram $CaCO_3$	Use the SHIFT button to move to the left.
CAPACITY SAFETY FACTOR	0 to 50	%	

Parameter	Options	Definition	Note
FEED WATER HARDNESS	1 to 1'999	Milligram $CaCO_3$/L	This screen will only display on the lead unit for system types 6 & 7. For all other system types, it will display for all units. Use the SHIFT button to move to the left.
TRIP POINT 1	1 to 3997	L/m	This screen will only display for system 14 and will only appear on the master controller (Valve address #1). Use the SHIFT button to move to the left.
TRIP DELAY 1	30 to 99	Second (30 seconds default)	
TRIP POINT 2	1 to 3997	L/m	This screen will only display for system 14 and will only appear with the system sized to 3 or 4 on the master controller (Valve address #1). Use the SHIFT button to move to the left.
TRIP DELAY 2	30 to 99	Second (30 seconds default)	
TRIP POINT 3	1 to 3997	L/m	This screen will only display for system 14 and will only appear with the system sized to 4 on the master controller (Valve address #1). Use the SHIFT button to move to the left.
TRIP DELAY 3	30 to 99	Second (30 seconds default)	
REGENERATION DAY OVERRIDE	OFF to 99	Day	Days between regenerations for timeclock mode.
REGENERATION TIME	00:00:00 to 23:59:59	Hour	Regeneration time will not appear unless regeneration day override or timeclock is on.
CYCLE 1	OFF to 04:00:00		
CYCLE 2	OFF to 04:00:00		
CYCLE 3	OFF to 04:00:00		
CYCLE 4	OFF to 04:00:00		

Parameter	Options	Definition	Note
CYCLE 5	OFF to 04:00:00	Hour	This screen will only display when cycle 4 is not OFF.
AUXILIARY RELAY	Enabled	-	Not compatible with CPO AUX activation.
	Disabled	(Default)	
AUX RELAY OUTPUT START	00:00:00 to 18:00:00	Hour	Only displayed if auxiliary relay is enabled in previous screen. Auxiliary relay will only display if chemical pump is OFF for system types 6 & 7.
AUX RELAY OUTPUT END	00:00:00 to 18:00:00		
CHEMICAL PUMP	Enabled	-	This screen will only display on the lead (#1) unit for system types 6 & 7. For all other system types, it will display for all units.
	Disabled	(Default)	
CPO AUX RELAY VOLUME	1 to 9'999	L	Activate the relay output during a service based upon the volume of treated water. Relay is activated for a set time after every set volume is treated. Not compatible with aux. relay activation.
CPO AUX RELAY TIME	00:00:00 to 02:00:00	Hour	
FLOW METER	1.0" PADDLE	-	Default flow meter type is based on the valve type. This screen will only display on the lead (#1) unit for system types 6 & 7. All other system types it will display for all units.
	1.0" TURBINE	-	
	1.5" PADDLE	-	
	1.5" TURBINE	-	
	2.0" PADDLE	-	
	3.0" TURBINE	-	
	GENERIC	-	
PEAK FLOW RATE	20 to 2'000	Lpm	Only displayed if "Generic" is chosen for the flow meter.
ADD XXX LITERS EVERY YYY PULSES	1 to 255	XXX: number of litres YYY: number of pulses	

6.5.2. Entering master programming mode

A   Press ⬅ and ⟋⟍ simultaneously for 5 seconds to enter the master programming mode.

```
7#1 SRV* 08:26HR
VOLUME    20000L
```

6.5.3. Language setting

Select the displayed language.

Options:
- English;
- French;
- German;
- Italian;
- Spanish.

B   Select the language to be displayed with ⟍⟋ and ⟋⟍.

C   Press ⟳ to validate the selection and advance to the next parameter.

```
SELECT LANGUAGE:
        ENGLISH
```

6.5.4. System type

Select the system in which the valve(s) operate(s).

Options:
- 4: single valve;
- 5: multiple valves with lockout;
- 6: multiple valves with consecutive regenerations;
- 7: duplex alternating;
- 9: multiple valves, alternating;
- 14: multiple demand valves.

D   Set the system type with ⟍⟋ and ⟋⟍.

E   Press ⟳ to validate the selection and advance to the next parameter.

Example: 4 Single valve.

```
SYSTEM TYPE   :4
SIMPLEX
```

Example: 5 multiple valves.

```
5#1 SRV* 10:15HR
VOLUME    25000L
```

6.5.5. Valve address in the system

Set the valve position in the system.

> **Note**
> Only visible in systems 5, 6, 7, 9 and 14.

> **Note**
> The number #1 is the lead valve (master) and contains the programmed parameters used by the other controllers in the system in order to control the regeneration and service or standby positions.

Options:
- address #1: valve 1, lead (master);
- address #2: valve 2;
- address #3: valve 3;
- address #4: valve 4.

F Set the valve position with ∨ and ∧.
→ Default setting: valve 2 address #2.

G Press ⟳ to validate the selection and advance to the next parameter.

Example: Valve #1 (master).

```
VALVE   ADDRESS
            #1
```

Example: Valve #2.

```
VALVE   ADDRESS
            #2
```

6.5.6. System size

Set the number of valves to be connected (2 to 4 valves) in the system.

> **Note**
> Only visible in multiple valve systems and only present on the master #1 valve.

Options:
- 2 valves in the system;
- 3 valves in the system;
- 4 valves in the system.

H Adjust the system size with ∨ and ∧.
→ Default setting: 2 valves.

I Press ⟳ to validate the selection and advance to the next parameter.

```
SYSTEM SIZE   :
        2 VALVES
```

6.5.7. Regeneration type

Select the regeneration type.

Options:
- time clock delayed: regeneration will take place, at the programmed regeneration start up time, after predetermined delay set up in day elapsed (available only for system type 4);
- volume delayed: regeneration is requested when the volume of treated water reaches the reserve capacity and will take place, at the programmed regeneration start up time (available only for system type 4);
- volume immediate: regeneration is requested when the capacity is fully depleted. The regeneration starts immediately (available for all system types).

J Set regeneration type with ⌄ and ⌃.

K Press ⟳ to validate the selection and advance to the next parameter.

```
REGEN TYPE
TIME CLK DELAYED
```

6.5.8. Valve type

Select which valve is being used with the NXT.

Options:
- 2750;
- 2850;
- 2900/2910;
- 3150;
- 3900.

L Set valve type with ⌄ and ⌃.
→ Default setting: 2750

M Press ⟳ to validate the selection and advance to the next parameter.

```
VALVE TYPE:
       2900/2910
```

6.5.9. Regeneration flow

Set the direction of flow during the brine draw cycle.

ⓘ Note
The availability depends on the valve type programmed in the previous step.

Options:
- down flow;
- up flow (not for 2850 valve type);
- up flow fill first (only for 2750 and 2900/2910 types).

N Set regeneration flow with ⌄ and ⌃.
→ Default setting: down flow

```
REGENERANT FLOW:
       DOWN FLOW
```

O Press ⟳ to validate the selection and advance to the next parameter.

6.5.10. Remote started regeneration

Start regeneration from an external signal (see chapter 5.9. Electrical connections, page 50).

> **i** **Note**
> The contact will close after a preset duration. When the contact closes, the regeneration starts.

> **i** **Note**
> This mode can be combined with the other methods of regeneration; it has priority once it is activated.

P Set the remote controller with ⌄, ⌃ and ⬅ .
→ Can be adjusted from OFF to 01:39:00.

Q Press ⟳ to validate the selection and advance to the next parameter.

Without remote controller.

```
REMOTE SIGNAL
START:OFF
```

With remote controller and 1 minute contact programmed.

```
REMOTE SIGNAL
START:  00:01:00
```

6.5.11. Display format

Set the unit system to be used.

Options:
- US GALLONS: volume in gallons, time display 2 x 12 hours, hardness in grains;
- EU-METRIC-LITERS: volume in litre, time display 24 hours and hardness depends on the language:
  EN: mg/L as $CaCO_3$ FR: °F   GE: °dH   IT: °TH   SP: °TH

R Set the display format with ⌄ and ⌃.

S Press ⟳ to validate the selection and advance to the next parameter.

```
DISPLAY FORMAT:
EU-METRIC-LITERS
```

6.5.12. System capacity

Set the capacity of the tank where the valve is installed.

> **Note**
> On the basis of system capacity, safety coefficient and inlet water hardness, the controller calculates the volume of water that the system can treat between 2 regenerations.

T Set the unit capacity with ⟍⟋, ⟋⟍ and ⟵ .

U Press ⟲ to validate the selection and advance to the next parameter.

Example: 3000 g of $CaCO_3$ of capacity.

```
UNIT CAPACITY:
    003000 gCaCO3
```

This volume corresponds to the volume the tank could treat if the inlet water hardness is 1°F, 1°TH or 1°dH.

6.5.13. Safety coefficient

Set the percentage value by which the total capacity is reduced as a safety coefficient.

V Set the safety coefficient with ⟍⟋, ⟋⟍ and ⟵ .
→ Can be adjusted from 0 to 50%.

W Press ⟲ to validate the selection and advance to the next parameter.

No safety factor programmed.

```
CAPACITY SAFETY
FACTOR   00%
```

6.5.14. Inlet water hardness

Set the input water hardness in the unit set on chapter 6.5.11. Display format, page 65.

X Set the inlet water hardness with ⟍⟋, ⟋⟍ and ⟵ .

Y Press ⟲ to validate the selection and advance to the next parameter.

```
FEED WATER
HARDNESS:0030mgL
```

6.5.15. Trip points setting

Set the flow rate and switching delay when another tank is switched to service.

> **Note**
> Only visible in system 14.

6.5.15.1 Trip point 1

ℹ Note
Only visible if controller programmed as valve position #1.

Z Set the trip point 1 flow rate with ⬃, ⬁ and ⬅ .
→ Can be adjusted from 0 to 3997 Lpm.

```
TRIP POINT 1:
        0000 Lpm
```

AA Press ⟳ to validate the selection and advance to the next parameter.

AB Set the trip point 1 delay with ⬃, ⬁ and ⬅ .
→ Can be adjusted from 30 to 99 seconds.

```
TRIP DELAY 1:
      30 SECONDS
```

AC Press ⟳ to validate the selection and advance to the next parameter.

6.5.15.2 Trip point 2

ℹ Note
Only visible if controller programmed as valve position #1 and system size to 3 or 4.

AD Set the trip point 2 flow rate with ⬃, ⬁ and ⬅ .
→ Can be adjusted from trip point 1+1 to 3998 Lpm.

```
TRIP POINT 2:
        0000 Lpm
```

AE Press ⟳ to validate the selection and advance to the next parameter.

AF Set the trip point 2 delay with ⬃, ⬁ and ⬅ .
→ Can be adjusted from 30 to 99 seconds.

```
TRIP DELAY 2:
      30 SECONDS
```

AG Press ⟳ to validate the selection and advance to the next parameter.

6.5.15.3 Trip point 3

ℹ Note
Only visible if controller programmed as valve position #1 and system size to 4.

AH Set the trip point 3 flow rate with ⬃, ⬁ and ⬅ .
→ Can be adjusted from trip point 2+1 to 3999 Lpm.

```
TRIP POINT 3:
        0000 Lpm
```

AI Press ⟳ to validate the selection and advance to the next parameter.

AJ Set the trip point 3 delay with ⟍⟋, ⟍⟋ and ⬅ .
→ Can be adjusted from 30 to 99 seconds.

```
TRIP DELAY 3:
        30 SECONDS
```

AK Press ⟳ to validate the selection and advance to the next parameter.

6.5.16. Regeneration days override

Set the maximum number of days that the valve is in service without regenerating, regardless from the volume of water used.

> **ℹ Note**
>
> For a timeclock valve, this value must be set as regeneration period in days. For metered valves, it is regenerated once the amount of days is reached at a preset time unless the meter triggers regeneration before. Calendar override initiate regeneration only if no regeneration has been initiated within the delay programmed in calendar override parameter.

AL Adjust the number of days with ⟍⟋, ⟍⟋ and ⬅ .

AM Press ⟳ to validate the selection and advance to the next parameter.
→ Can be adjusted from:

    1 to 99 days for timeclock regeneration;

    OFF to 99 days for metered regeneration.

Without calendar forcing.
```
REGENERATION DAY
OVERRIDE:OFF
```
Forcing every 3 days.
```
REGENERATION DAY
OVERRIDE:03DAYS
```

6.5.17. Regeneration start time

Set the time for regeneration start.

> **⚠ Mandatory**
>
> It must be set when the valve is in timeclock mode or with a calendar override.

AN Adjust the time of regeneration with ⟍⟋, ⟍⟋ and ⬅ .

AO Press ⟳ to validate the selection and advance to the next parameter.

Regeneration at 2:00 am.
```
REGENERATION
TIME     02:00HR
```

6.5.18. Programming regeneration cycle times

Set the cycle times of the regeneration.

---

i **Note**
Five cycles can be set. The system displays the programming cycles. The display allows setting of a specific time for each cycle. If a cycle is set to NO, the next cycles is not activated.

i **Note**
The sequence of the regeneration cycles depends upon regenerant flow, see 3.4. System regeneration cycle, page 18.

AP Adjust the cycle time with ⟍⟋, ⟋⟍ and ⬅ .

AQ Press ⟳ to validate the selection and advance to the next parameter.

AR Repeat for each cycle.

1. Backwash: 10 min.

```
CYCLE 1 00:10:00
        BACKWASH
```

2. Draw/Slow rinse: 1 h 10 min.

```
CYCLE 2 01:10:00
BRINE&SLOW RINSE
```

3. Fast rinse: 10 min.

```
CYCLE 3 00:10:00
     RAPID RINSE
```

4. Refill: 10 min.

```
CYCLE 4 00:10:00
  BRINE TANK FILL
```

5. Pause: not used.

```
CYCLE 5 OFF
    PAUSE & DELAY
```

6.5.19. Auxiliary relay/Chemical pump

! **Mandatory**
The system can't be set with auxiliary relay and chemical pump at the same time. Only one option can be used.

6.5.19.1 Auxiliary relay

Set the relay output during regeneration.

---

i **Note**
This parameter has two steps of settings. The first one activates the output, and the second one deactivates the output. The time 00:00:00 correspond to the beginning of regeneration time.

AS Activate the relay with ⌄ and ⌃.
→ Default setting: disabled.

AT Press ⟳ to validate the selection and advance to the next parameter.

AU Set the relay activation time with ⌄, ⌃ and ⬅ .

AV Press ⟳ to validate the selection and advance to the next parameter.

AW Set the relay deactivation time with ⌄, ⌃ and ⬅ .

AX Press ⟳ to validate the selection and advance to the next parameter.

Disabled.

```
AUXILIARY RELAY:
         DISABLED
```

Relay enabled at the beginning of regeneration.

```
AUX RELAY OUTPUT
START:   00:00:00
```

Relay disabled 10 min. after the start of regeneration.

```
AUX RELAY OUTPUT
END:     00:10:00
```

Relay enabled during cycle 2 as in chapter 6.5.18.

```
AUX RELAY OUTPUT
START:   00:10:00
```

```
AUX RELAY OUTPUT
END:     01:20:00
```

6.5.19.2 Chemical pump

Activate the relay output during the service based upon the volume of treated water.

ℹ **Note**
Only visible in metered systems.

ℹ **Note**
This parameter has two steps. The first one determines the volume which activates the relay. The second one determines how long the relay has to be activated once the volume has passed.

AY Activate the relay with ⌄ and ⌃.
→ Default setting: disabled.

AZ Press ⟳ to validate the selection and advance to the next parameter.

BA Set the relay activating time with ⌄, ⌃ and ⬅ .

BB Press ⟳ to validate the selection and advance to the next parameter.

BC Set the relay deactivating time with ⌄, ⌃ and ⬅ .

BD Press ⟳ to validate the selection and advance to the next parameter.

Disabled.

```
CHEMICAL PUMP:
         DISABLED
```

Relay enabled every 20 litres.

```
CPO AUX RELAY
VOLUME:   0020  L
```

Relay enabled for 1 min.

```
CPO AUX RELAY
TIME:    00:01:00
```

6.5.20. Flow meter selection

Select the size of the flow meter.

Options:
• 1" paddle;
• 1" turbine;
• 1½" paddle;
• 1½" turbine:
• 2" paddle (standard for 2910 valve);
• 3" paddle;
• generic meter.

BE Select the flow meter with ⋁ and ⋀.

BF Press ⟳ to validate the selection and advance to the next parameter.

```
FLOW METER
     2.0"PADDLE
```

6.5.20.1 Generic meter

ℹ Note
Only visible if "generic" was selected in flow meter selection.

Set the generic meter.

ℹ Note
This parameter has two settings. The first one determines the volume which activates the relay. The second one determines how long the relay has to be activated.

BG Set the maximum flow rate with ⋁, ⋀ and ⬅ .

BH Press ⟳ to validate the selection and advance to the next parameter.

BI Set the number of litres per pulse with ⋁, ⋀ and ⬅ .

BJ Press ⟳ to validate the selection and advance to the next parameter.

Example: 290 L/min.
```
PEAK FLOW
       0290 lpm
```
Example: 1 litre for 1 pulse.
```
ADD  001 LITERS
EVERY 001 PULSES
```
Example: 5 litres for 1 pulse.
```
ADD  005 LITERS
EVERY 001 PULSES
```
Example: 2 litres for 10 pulses.
```
ADD  002 LITERS
EVERY 010 PULSES
```

6.5.21. Parameters saving

i **Note**
When the last parameter is set and the button ⟳ pressed, the controller updates the database based on the new programming. Wait until programming is finished, this may take a few seconds.

```
PROGRAMMING UNIT
PLEASE WAIT...
```

6.6. Diagnostic

i **Note**
Depending on current settings, some displays cannot be viewed.

i **Note**
There is no time limit on the displays in the Diagnostic mode.

6.6.1. Commands

A Press D to enter the Diagnostic mode.

B Press ⟳ to pass at the next step.

C Press D to exit the Diagnostic mode at any time.

6.6.2. Current flow rate

i **Note**
The display is updated every second.

```
CURRENT FLOW RAT
L/min       0Lpm
```

6.6.3. Peak flow rate

i **Note**
The controller registers the highest flow rate since the last regeneration.

```
PEAK FLOW   RATE
            0Lpm
```

6.6.4. Totalizer

Note
The controller registers the total volume of treated water that passes through the meter since start-up (or last hard reset).

A To reset, press and hold the buttons ∨ and ∧ for 5 seconds until the display shows zero.

```
TOTALIZER    :
             0   L
```

6.6.5. Hours between last two regenerations

Note
Shows the number of hours between the last two regenerations, which indicates the duration of the last service cycle.

```
2 LAST     REGEN
         0   HOUR
```

6.6.6. Hours since last regeneration

Note
Shows the number of hours since the last regeneration, indicating the duration of the current service cycle.

```
LAST      REGEN.
         0 HOUR
```

6.6.7. Volume remaining

Note
Shows the volume remaining for the valve where controller is installed, excepted for system #6 where it shows the volume remaining of the complete system.

In system #4, #5, #7, #9 and #14.

```
VOL REMAINING
         100000L
```

In system #6 (complete system).

```
VOL REMAIN  SYST
         0100000L
```

6.6.8. Valve position

ℹ️ **Note**
Shows the position of the valve in a multiple valve system, also called the valve address.

```
VALVE ADDRESS:
              #2
```

6.6.9. Software version

ℹ️ **Note**
Shows the version of the software used by the controllers.

❗ **Mandatory**
In case of use of multiple valves system, verify the controller's software compatibility.

```
3200NXT:
VERSION 2.04
```

6.7. Resetting the controller

Mandatory
Once you have completed this operation, it is necessary to check all programming steps.

Note
There are two methods to reset.

6.7.1. Partial reset

Caution
All the parameters are set to default values, except flow meter totalizer volume in diagnostic mode.

A   Press and hold ∨ and ∧ for 25 seconds until the display shows time of day.

```
                                    12:00
```

6.7.2. Hard reset

Caution
All the parameters are set to default values.

A   Disconnect the power supply from the valve, press and hold the button ✧ while reconnecting the power supply.

7. Commissioning

> **ℹ Note**
> This chapter is available for standard regeneration types. Contact your supplier if the actual regeneration is not standard and if you need assistance.

7.1. Water filling, draining and waterproofness inspection

7.1.1. Activating a single valve system (System #4)

A With the bypass still in Bypass position (inlet and outlet of the valve closed), plug in the NXT controller to the power source.

B Proceed to programming according to your system specification if not done yet.

C Start a manual regeneration by pressing the regen button for 5 seconds. The valve will move the pistons, placing the lower piston into regeneration position and the upper piston into backwash position. Once in this position, unplug the NXT controller from the power source.

D With the outlet manual valve still closed, slowly open the inlet manual valve. The valve and tank will slowly get filled with raw water, allowing air to be purged by the drain. Open the inlet let progressively until fully open position.

E Once the drain runs clear and the inlet manual valve fully open, plug in again the NXT controller to the power source.

F Push on the regen button once to move the valve pistons to the next regeneration cycle position. Leave the valve 1 minute in each positions and move to the next one, until C5 is displayed. When C5 is displayed, let the valve run the entire cycle and check the level of water in the brine tank. The level of water in the brine tank should be about 5 cm above the salt platform. You may want to mark the level on the brine tank as this can be used as an indicator for the future lifetime of the softener.

G Once C5 is completed, the valve will automatically go back into service position. Start again a manual regeneration by pressing for 5 seconds on the regen button. The valve will move to backwash position.

H Press the regen button once to move to brine draw position. Check to see in the brine tank is the water level decrease.

I Once the draw function is observed and confirm (level of water in the brine tank has decreased), you may go through each cycle pushing on the regen button until C5, leave the water come back to the 'full' level, and then push on the regen button so that the valve returns into service position.

J Slowly open the outlet manual valve, and close the bypass manual valve. The system is now in service.

K Fill the brine tank with salt. You may want to mark the level of water in the brine tank when 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 a irregularity during regeneration that may lead to softener inefficiency.

L With the brine tank completely refilled and full of salt, adjust the safety brine valve in the brine well. Make sure the overflow elbow is installed above the float level.

M After the softener has been running a few minutes in service, proceed to hardness test on outlet water to make sure the water is treated as per requirements.

7.1.2. Activating a multiple valves system (Systems #5, #6, #7, #9 and #14)

A   Follow the previous procedure for each tank of the system.

> ℹ️ **Note**
> In order to gain time, program first all tanks as single system #4. Proceed to start up as described above for each tank, then program the correct system type and valve address and eventually set/trip points in case of system #14.

7.1.2.1   Triplex and quadruplex system

After start up is complete and system is synchronized according to the system type program, adjust manually the tanks remaining capacities per tank in the diagnostic mode. If the capacity of the tanks in service are not all equal, the system can arrive in the unwanted situation where the two tanks in service are exhausted at the same time. One of those would regenerate and the second would stay online, therefore delivering water of uncertain quality until the other tanks has finished the regeneration. This can be avoided by manually balancing the capacity.

Example:

The system is triplex (system #5 or #9). The valve with address #1, is set capacity at 50% of its real capacity in the diagnostic mode. The valve with address #2 is set it at 75% and the valve with address #3 is left at the real capacity. (Depending on the resin volume, you may also choose to balance on 33%, 66% and 100%).

Once regenerated, each tank will restart its cycle with 100% of its capacity as programmed.

The capacity adjustment in the diagnostic mode is valid only for the current cycle, it does not affect not modify the programmed system capacity.

7.2.   Sanitization

7.2.1. Disinfection of water softeners

The materials of construction of the modern water softener will not support bacterial growth, nor will these materials contaminate a water supply. In addition, during normal use, a softener may become polluted with organic matter, or in some cases with bacteria from the water supply. This may result in an off-taste or odor in the water.

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

Depending on the conditions of use, the softener type, the type of ion exchanger, and the disinfectant available, a choice can be made 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 1.25 mL fluid per 1 L of resin.
Non-resinous exchangers: set 0.85 mL fluid per 1 L.

Brine tank softeners

Backwash the softener 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 softener.
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.
Do not let the disinfectant stand for more than 3 hours in the brine tank before the regeneration start.

Dosage

Measure two grains ~ 0.11 mL for 1 L.

Brine tank softeners

Backwash the softener 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 to be carried into the softener.
Proceed with the normal regeneration.

7.2.3. Electro chlorination

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

8. Operation

8.1. Display

8.1.1. During service

• Single valve in service in timeclock mode:

```
4#- SRV  15:25HR
REGEN IN 03 DAYS
```

• single valve in service in volume immediate or delayed mode:

```
4#- SRV* 14:24HR
VOLUME     8000L
```

• lead valve in regeneration queued in interlock system:

```
5#1 RGQ* 10:15HR
VOLUME     3000L
```

• valve 3 in service in serial regeneration system:

```
6#3 SRV* 08:42HR
SYSVOL    45000L
```

8.1.2. During regeneration

During regeneration the display shows the cycle number and the time remaining for that cycle. The countdown for the time remaining starts only when the valve is in the cycle displayed.

• Cycle 1, time remaining 10 min:

```
CYCLE 1 00:10:00
```

• cycle 2, time remaining 1 hour 20 min:

```
CYCLE 2 01:20:00
```

• cycle 3, time remaining 50 min:

```
CYCLE 3 00:50:00
```

• cycle 4, time remaining 2 hours 40 min:

```
CYCLE 4 02:40:00
```

• cycle 5, time remaining 15 min:

```
CYCLE 5 00:15:00
```

8.1.3. LED status

1. Blue → the unit is in service and no errors detected.
2. Blue flashing → the unit is in service with a queued regeneration.
3. Green → the unit is in regeneration.
4. Green flashing → the unit is in standby position, in a multi tank system.
5. Red → the controllers have detected an error.

8.2. Recommendations

- Use only regeneration salts designed for water softening in accordance with EN973;
- for optimal system operation, the use of clean salt, free from impurities, is recommended (for example salt pellets);
- do not use ice melt, block, or rock salts;
- the sanitizing process (both with liquid and electrochlorination) may introduce chlorine compounds which may reduce the lifetime of the ion exchange resins. Refer to the technical guides for resins in common use, providing necessary checks on the system.

8.3. Manual regeneration

Mandatory
The controller must be in service in order to enable this procedure.

8.3.1. Manual delayed regeneration

A Press ⬦ once for delayed regeneration.
→ The regeneration starts on the programmed regeneration time. See chapter 6.5.17. Regeneration start time, page 68;
→ The blue LED flashes and the letters RGQ take place on the valve state.

Note
To cancel: press ⬦ again. The blue LED stop flashing and the letters SRV take place on the valve status.

8.3.2. Immediate regeneration

A Press and hold ⬦ for 5 seconds to initiate immediate manual regeneration, independent of which mode of regeneration is programmed.

8.4. To advance regeneration cycles

A Press ⬦ to pass to the next regeneration cycle.

8.5. Operation during a power failure

- All the program settings are stored in a permanent memory;
- current valve position, cycle step time elapsed, and time of day are stored during a power failure, and will be restored upon power restoration;
- time is kept during a power failure and the time of day is adjusted upon restoration of the power (as long as the power is restored within 12 hours);
- the time of day on the main display screen will flash after a power failure once the power is restored until any button is pressed on the keyboard.

9. Maintenance

Mandatory
Cleaning and maintenance shall take place at regular intervals in order to guarantee the proper functioning of the complete system, and be documented in the Maintenance chapter in the User Guide document.

Mandatory
The maintenance must be done by a professional certified by Pentair, otherwise the warranty will void.

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.
Usage of non-genuine spare parts void all warranties.

Parts to keep in stock for potential replacements are the pistons, S&S kit, injectors, micro-switches and motors. Refer to maintenance sheet.

9.1.2. Use original approved lubricants
• Dow Corning #7 Release Agent

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 odor;
• perform a hardness test every year of both inlet and treated water.

9.2. Cleaning and maintenance

9.2.1. First steps

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

No.	Operation
⚠	**Caution** 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. Upper power head motor replacement

No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Using a flat screwdriver, unscrew (**3**) and open the controller (**4**).
C	Using a pliers, remove the connecting pin (**7**).
D	Using a flat screwdriver, unscrew (**6**) and remove the motor (**5**).
E	Reverse above procedure steps to rebuild
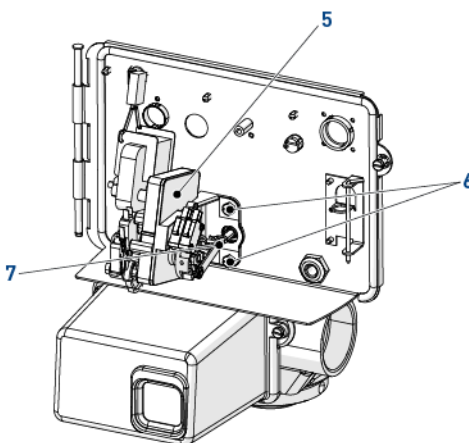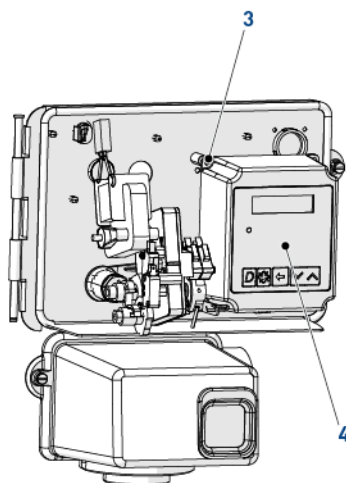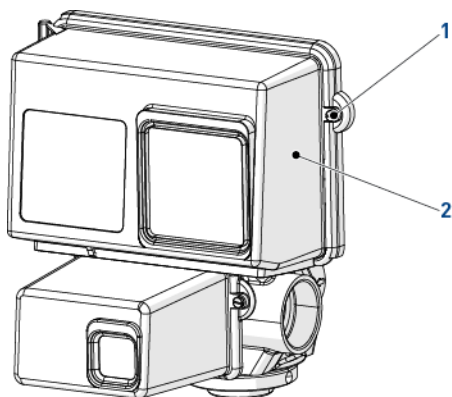
9.2.3. Upper motor cams and micro-switches replacement

No.	Operation
A	Using a Phillips screwdriver, unscrew (**1**) and extract the micro-switches (**2**).
B	Using pliers, remove the pins (**4**).
C	Replace the cams ensuring they are in the same position (**3**).
D	Reverse above procedure steps to rebuild.
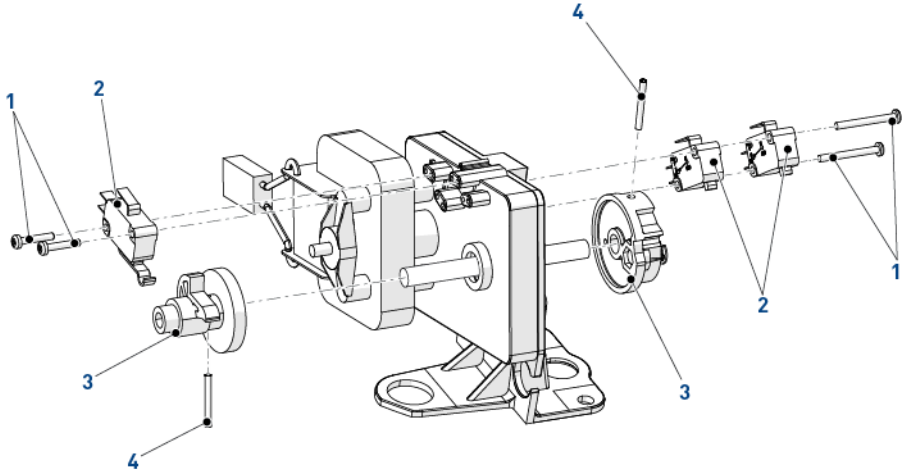
9.2.4. Lower power head motor replacement

No.	Operation
A	Using a flat screwdriver, unscrew (**2**) and open the cover (**1**).
B	Using a pliers, remove the connecting pin (**4**).
C	Using a 6 mm Allen key, unscrew (**3**) and remove the motor (**5**).
D	Reverse above procedure steps to rebuild.
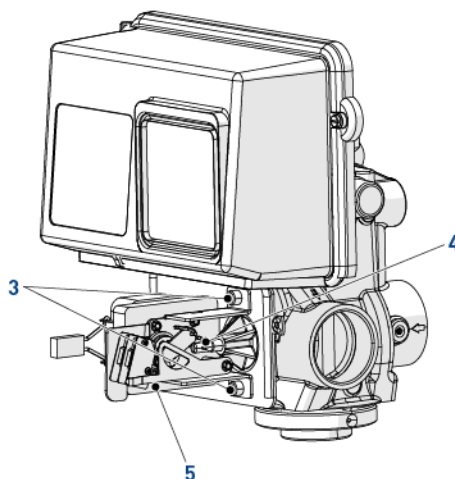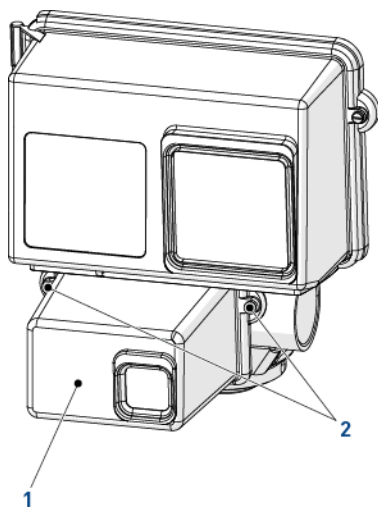
9.2.5. Lower motor cams and micro-switches replacement

No.	Operation
A	Using a Phillips screwdriver, unscrew (**3**), extract the micro-switches (**2**) and protections (**1**).
B	Using a 6 mm wrench, unscrew (**10**), remove the washer (**9**) and the pointer (**8**).
C	Using a pliers, remove the circlip (**7**) and the arm (**6**).
D	Using a pin hunting, remove the pins (**4**).
E	Put back the cam (**5**).
F	Reverse above procedure steps to rebuild.
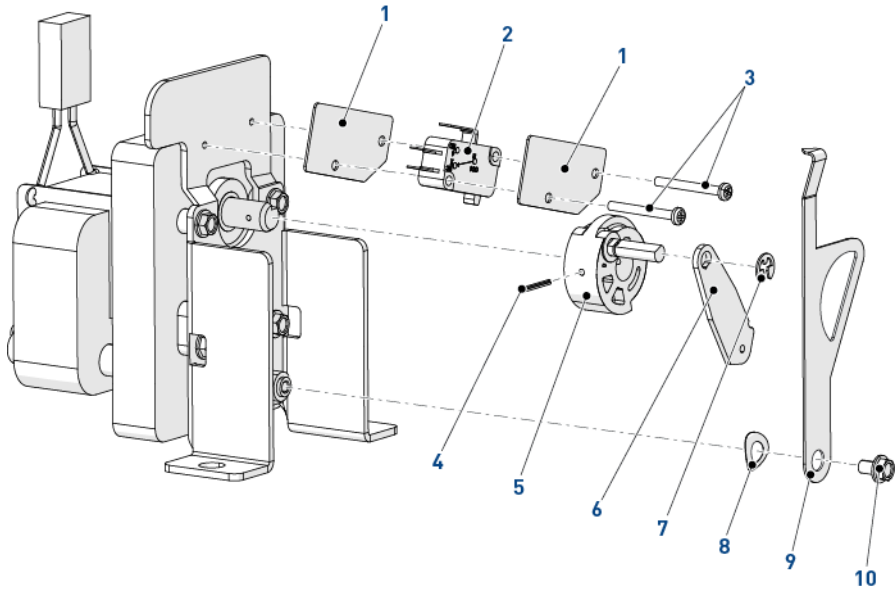
9.2.6. Upper piston and/or seal and spacer kit replacement

No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Using pliers, remove the connecting pin (**3**).
C	Using a flat screwdriver, unscrew (**4**) and remove the motor assembly (**6**).
D	Using a 22 mm wrench, unscrew the brine valve nut (**7**) and remove the upper power head (**5**).
E	Using pliers, remove the piston (**10**).
F	Using a small hook, remove an upper seal (**9**).
G	Using the puller, remove an upper spacer (**12**).
H	Repeat **G** and **H** for all the seals and spacers.
I	Put back the first new spacer (**8**) using the stuffer.
J	Lubricate each new seals (**9**).
K	Put back a seal (**9**) using the stuffer.
L	Put back a spacer (**12**) using the stuffer.
M	Repeat **M** and **N** for all the seals and spacers.
N	Lubricate the piston o-ring (**11**).
O	Put back the piston (**10**).
P	Follow **A** to **D** in reverse order to rebuild.

⚠️ **Caution**
Use only approved silicone grease or soapy water.

9.2.6.1 Special tools needed
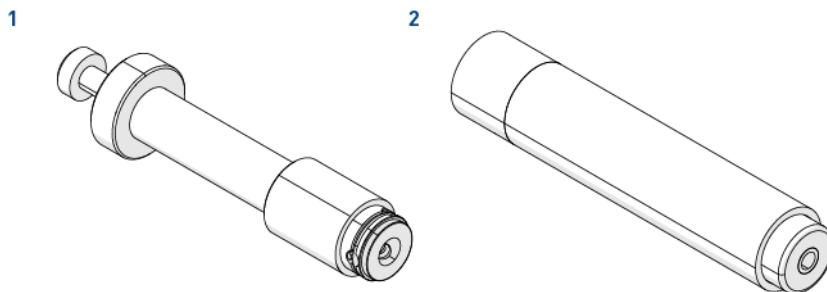
Item	Part number	Description	Packaging quantity
1	13061	Puller	1
2	11098	Stuffer	1
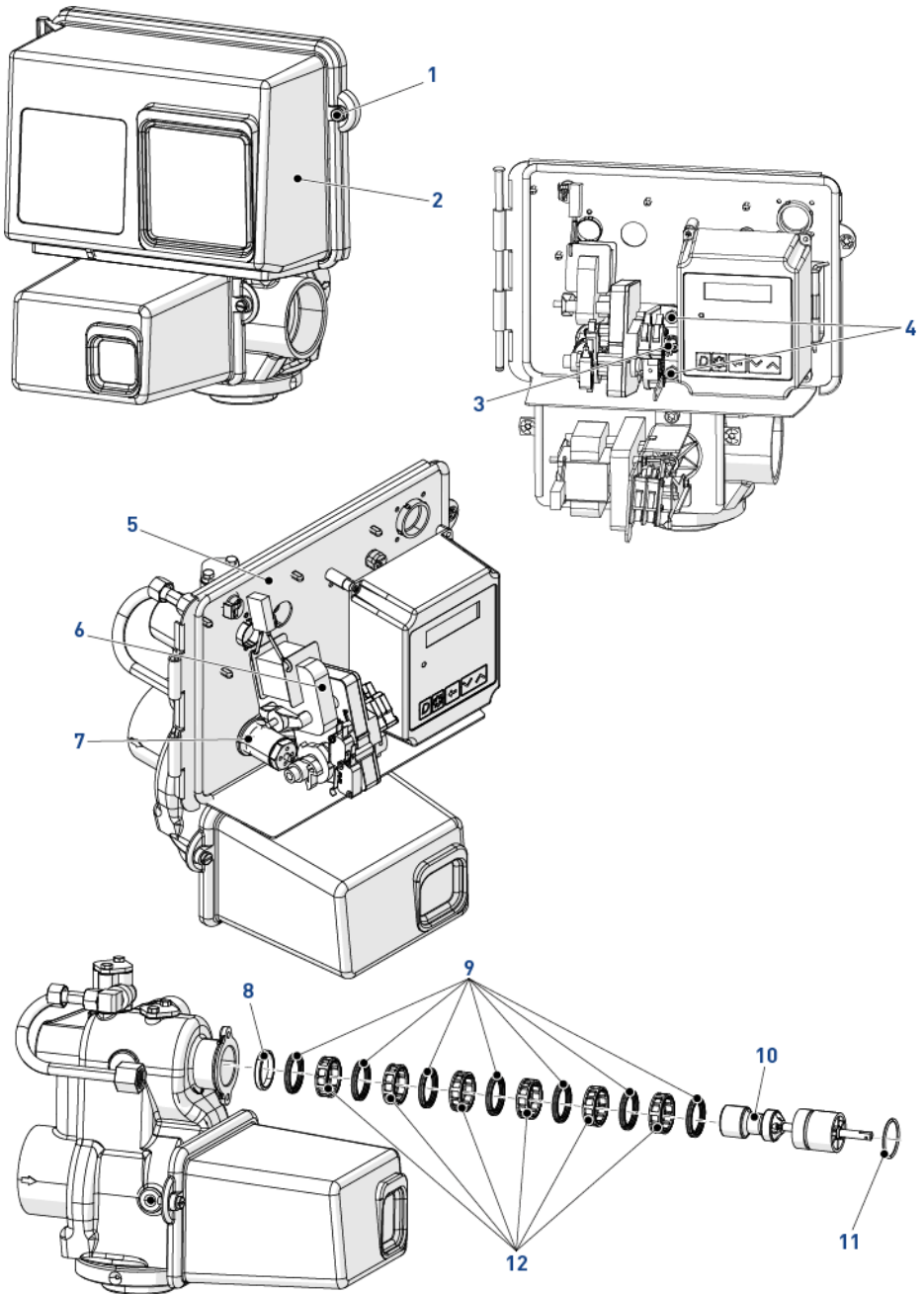
9.2.7. Lower piston and/or seal and spacer kit replacement

No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Using a pliers, remove the connecting pin (**5**).
C	Using a 6 mm Allen key, unscrew (**3**) and remove the lower power head (**4**).
D	Using a pliers, remove the piston (**8**).
E	Using a small hook, remove a lower seal (**10**).
F	Using the puller, remove a thin lower spacer (**6**).
G	Using a small hook, remove a lower seal (**10**).
H	Using the puller, remove the large lower spacer (**7**).
I	Using a small hook, remove a lower seal (**10**).
J	Using the puller, remove a thin lower spacer (**6**).
K	Using a small hook, remove a lower seal (**10**).
L	Put some lubricant on each new seals (**10**).
M	Lubricate the piston o-ring (**9**).
N	Using the puffer, follow **A** to **K** in reverse order to rebuild.

⚠️ **Caution**
Use only approved silicone grease or soapy water.

9.2.7.1 Special tools needed
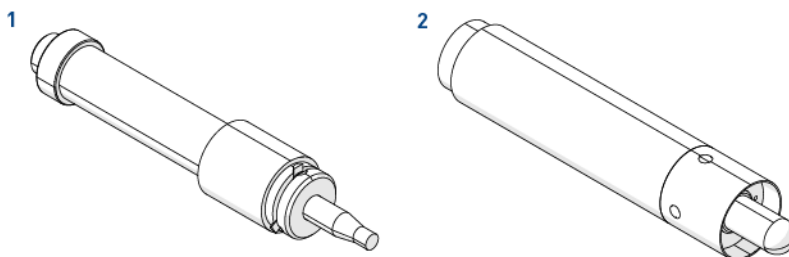
Item	Part number	Description	Packaging quantity
1	12682	Puller	1
2	12683	Stuffer	1
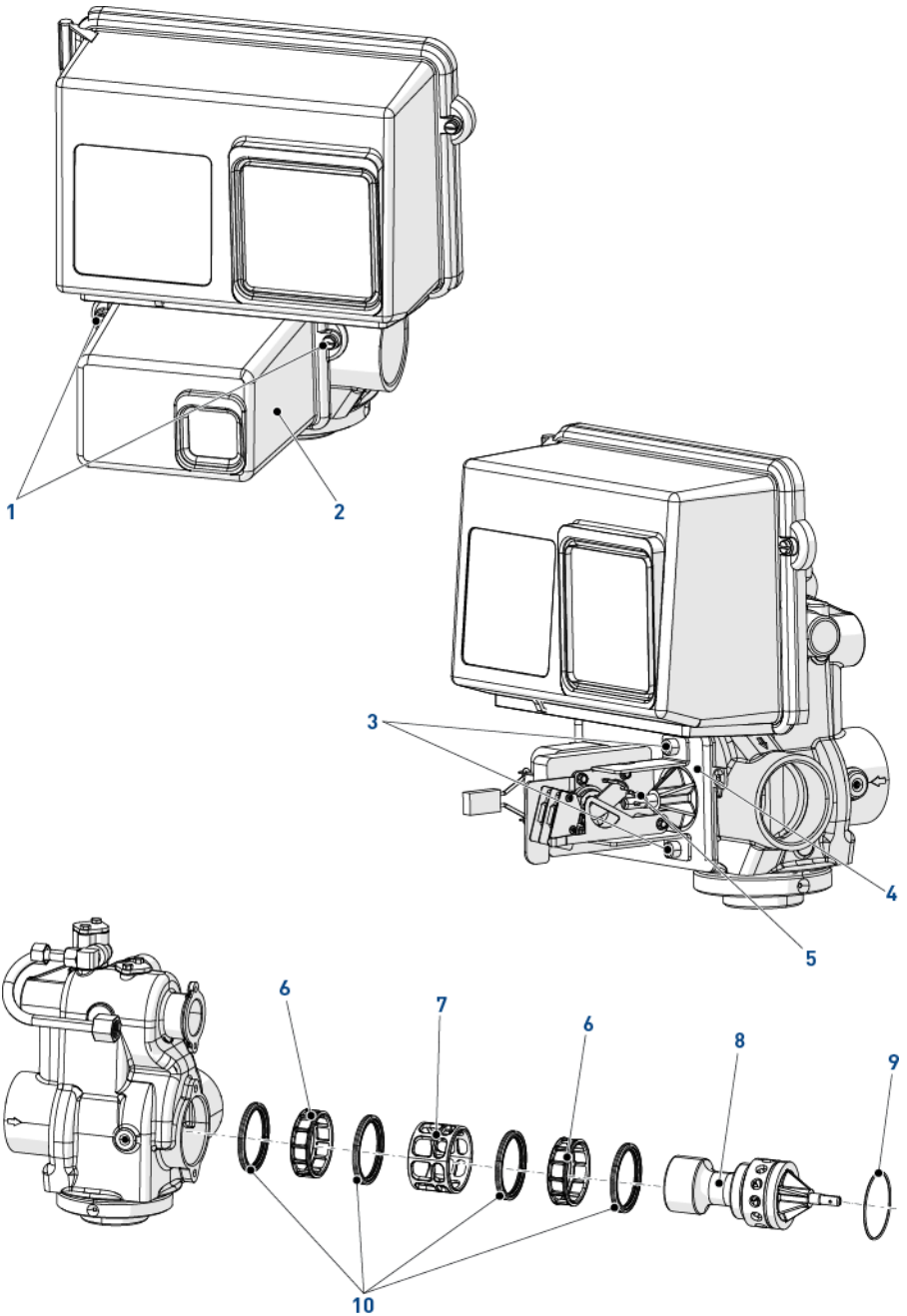
9.2.8. Injector cleaning

No.	Operation
A	Using a 8 mm and a 20 mm wrench, unscrew the screws (**1**) and the brine valve nut (**2**).
B	Using flat screwdrivers, remove the injectors (**5**) and (**6**) from injector body (**8**).
C	Clean the injectors (**5**) and (**6**) and the filter (**7**) using compressed air, a soft brush or possibly a pin.
D	Lubricate on the gaskets (**4**) and (**9**) using silicone grease.
E	Assemble as shown the injector in the valve body (**10**).
F	Reverse above procedure steps to rebuild.
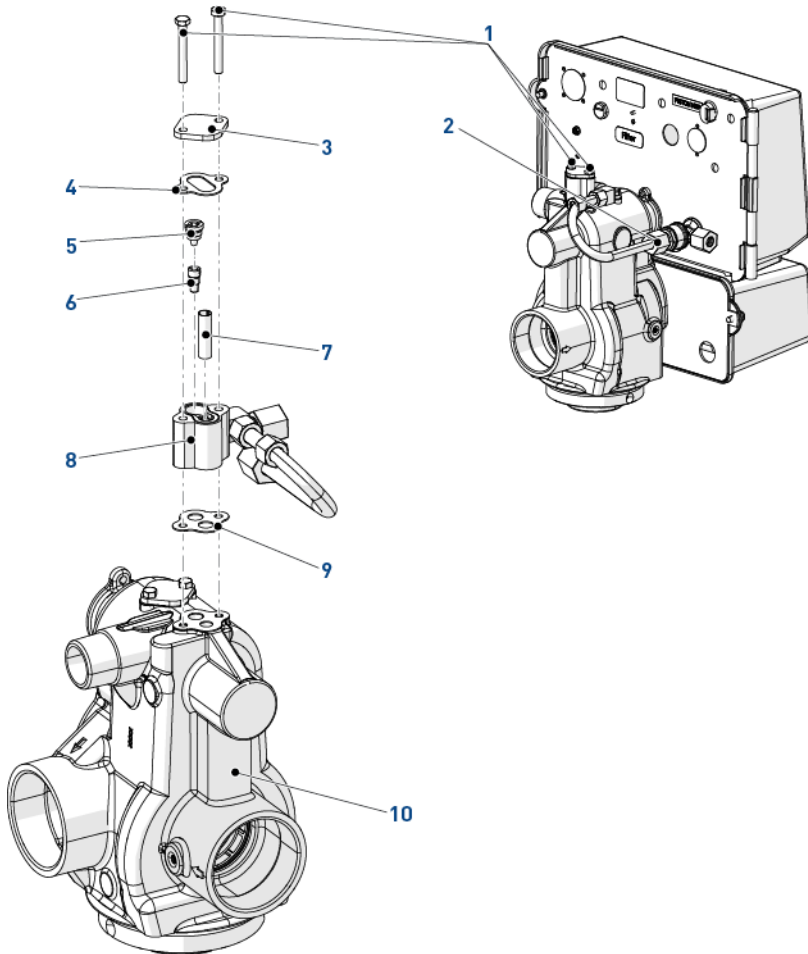
9.2.9. BLFC cleaning

No.	Operation
A	Using 16 mm and 21 mm wrenches, release the nuts (**2**) and remove the tube (**1**).
B	Using a 22 mm wrench, remove the flow washer holder (**3**) from the brine valve.
C	Using pliers, remove the grid (**4**) from the flow washer holder (**3**).
D	Remove the flow washer (**5**) from grid (**4**).
E	Clean or change the flow washer (**5**).
F	Lubricate the seal (**6**) with approved silicone lubricant only.
G	Follow **A** to **D** in reverse order to rebuild.
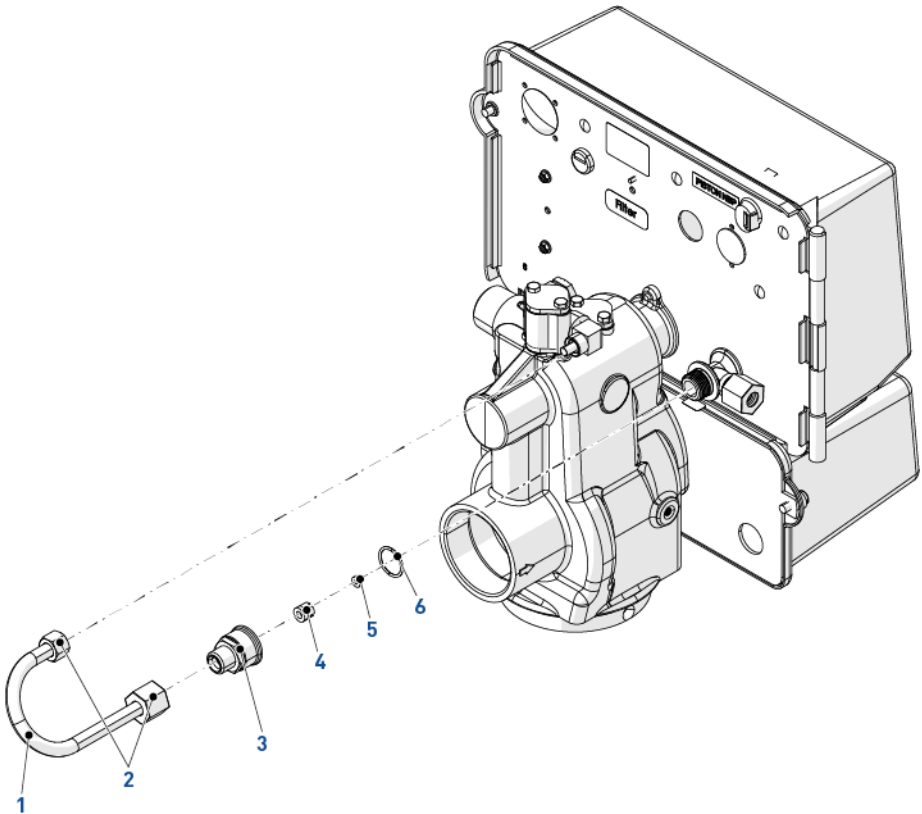
9.2.10. DLFC cleaning

No.	Operation
A	Using a 39 mm wrench, unscrew and remove the flow washer housing (**1**).
B	Remove the flow washer (**2**) from the flow washer housing (**1**).
C	Clean or change the flow washer (**2**).
D	Reverse above procedure steps to rebuild.

	Mandatory
(!)	The flow washers (**2**) have to be installed with their chamfered side upfront the water stream flow. Flow indication must be visible after the washer (**2**) is placed on the flow washer housing (**1**).
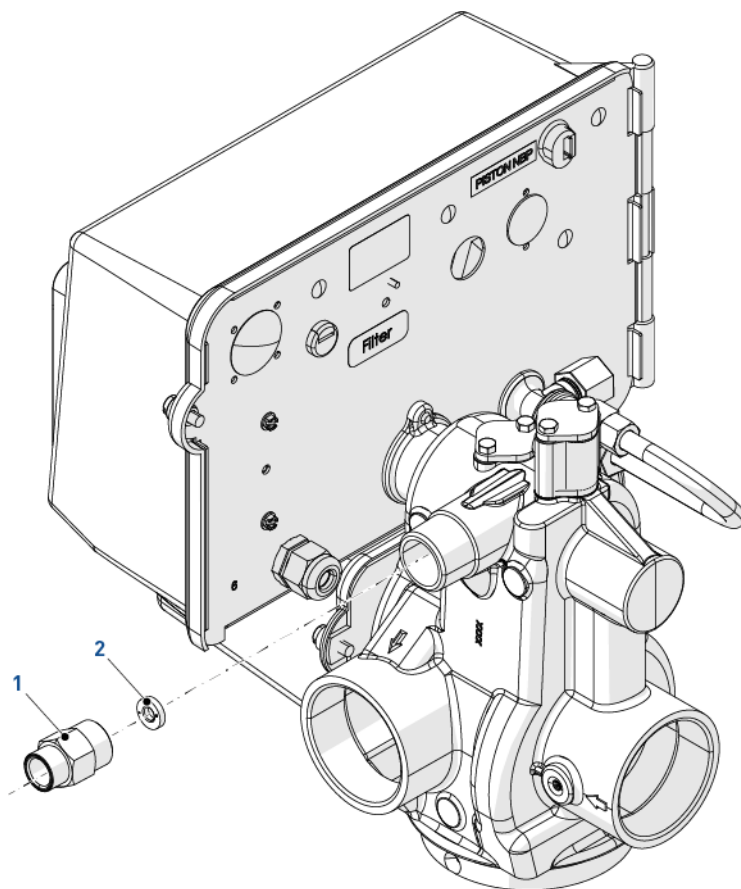
9.2.11. Assembling valve on tank

No.	Operation
A	Lubricate the seals with approved silicone grease.
B	Spin the valve (**1**) onto the tank (**2**), ensuring the threads are not cross-threaded.
C	Rotate the valve (**1**) clockwise and freely, without using force until it comes to a stop.
ℹ️	**Note** This stop position is considered point zero.
D	Rotate the valve (**1**) clockwise from point zero to between ¼ turn and ½ turn.
⚠️	**Caution** Do NOT exceed 27 Nm of torque when installing the valve. Exceeding this limit may damage the threads and cause failure.
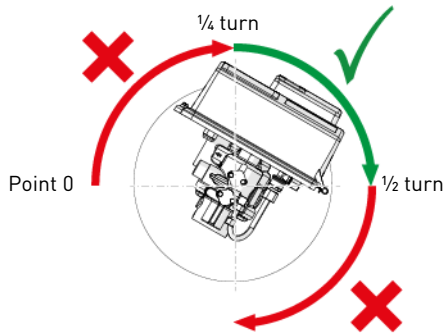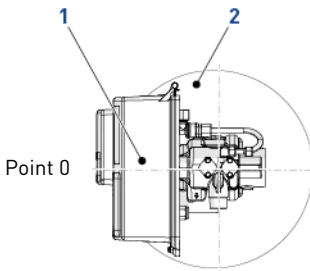
10.   Troubleshooting

10.1. Error detection

Note
It can take up to 30 seconds before an error can be detected and displayed.

Mandatory
All the errors must be displayed on each controller before they can be corrected.

- If an error is detected, the status LED light will be red;
- during an error condition, the unit continues to monitor flow and update the remaining capacity. Once an error condition is corrected, the unit returns to the operating status it was in prior to the error, and regeneration resumes according to normal programming;
- if an error is cleared by reprogramming the unit in the Master Programming Mode, the volume remaining may be reset to the full unit capacity (as though it had just regenerated);
- if an error is present, a regeneration can only occur manually by pressing and holding ⟳ for 5 seconds;
- if the unit was in regeneration when the error occurred, it completes the regeneration cycle and goes to service;
- when the problem is corrected, and the error no longer displays (it may take several seconds for the unit to stop displaying the error message), the unit returns to normal operation. The status LED light is no longer Red, and turns Green if the unit is regenerating, or Blue if the unit is in service.

Problem	Cause	Solution
Water softener fails to regenerate	Electrical service to unit has been interrupted.	Assure permanent electrical service (check fuse, plug, switch...).
	Timer is defective.	Replace controller.
	Power failure.	Reset time of day.
Hard water	By-pass valve is open.	Close by-pass valve.
	No salt is in brine tank.	Add salt to brine tank and maintain salt level above water level.
	Injector screen plugged.	Clean injector screen.
	Insufficient water flowing into brine tank.	Check brine tank fill time and clean brine line flow control if pugged.
	Leak at the distributor tube.	Make sure distributor tube is not cracked. Check o-ring and tube pilot.
	Internal valve leak.	Replace seals and spacers and/or piston.

Problem	Cause	Solution
Excessive salt consumption	Improper salt setting.	Check salt usage and salt setting.
	Excessive water in brine tank.	See problem "Excessive water in brine tank" below.
Controller cycles continuously	Maladjusted, broken or shorted micro-switch.	Determine if micro-switch or controller is faulty and replace it, or replace complete power head.
Loss of water pressure	Iron buildup in line to water softener.	Clean line to water softener.
	Iron buildup in water softener.	Clean controller and add mineral cleaner to mineral bed. Increase frequency of regeneration.
	Inlet of softener plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	Remove piston and clean the controller.
Loss of mineral through drain line	Air in water system.	Assure that well system has proper air eliminator control. Check for dry well condition.
	Improperly sized drain line flow control.	Check for proper drain rate.
Iron in conditioned water	Fouled mineral bed.	Check backwash, brine draw and brine tank refill. Increase frequency of regeneration. Increase backwash time.
Excessive water in brine tank	Plugged drain line flow control.	Clean flow control.
	Plugged injector system.	Clean injector and screen.
	Controller is not cycling.	Replace controller.
	Foreign material in brine valve.	Replace brine valve seat and clean valve.
	Foreign material in brine line flow control.	Clean brine line flow control.
Softener fails to draw brine	Drain line flow is plugged.	Clean drain line flow control.
	Injector is plugged.	Clean injector.
	Injector screen is plugged.	Clean screen.
	Line pressure is too low.	Increase line pressure to 1.4 bar.
	Internal valve leaks.	Change seals, spacers and piston assembly.
	Cam did not cycle.	Check drive motor and micro-switches.

Problem	Cause	Solution
Drain flows continuously	Controller is not programming correctly.	Check controller program and positioning of controls. Replace power head assembly if not positioning properly.
	Foreign material in valve body.	Remove power head assembly and inspect bore. Remove foreign material and check valve body in various regeneration positions.
	Internal valve leak.	Replace seals and piston assembly.

10.2. Programming error

If reprogramming the unit clears the error, the remaining volume may be reset to full unit capacity (as though it had just regenerated).

- All the units in service remain in service;
- all the units in standby go to service;
- when the error appears, the unit in regeneration finishes the regeneration and goes to service;
- no regeneration starts while the error condition remains.

When the programming problem is corrected and the error is no longer displayed (it may take several seconds for all the units of the system to stop displaying the error), the system returns to normal operation.

Some examples of programming errors detected are:
- valve address doubled;
- power failure;
- system size: ex. programmed for 4 units, but there are only 2 units;
- units of measure do not correspond between the different valves of the system;
- wrong type of valve programmed.

Cause	Solution
More than one unit programmed with the same position number.	Program correctly the units using only once per position number.
Flashing display.	There was a power failure.
Units of measure do not correspond: units have different units of measure programmed.	Check and program all units in the system with the same units of measure.
System size: the number of units in the system does not correspond to the number programmed and vice versa.	Check to make sure that system number and number of units correspond.

10.3. Examples of error displayed

- The unit 2 has been reset;
  → Reprogram the unit.

```
DETECTED ERROR =
E2    RESET UNIT
```

- there is no message from unit 3;
  → The number indicate the unit to be checked in the system.
  → Check that communication cables are connected.
  → Check the valve address.

```
ERROR   DETECTED
NO      MESSAGE 3
```

- there are more units in the system than programmed in the lead (#1) unit;

```
ERROR   DETECTED
SYSTEM SIZE    !
```

- the programmed values do not match, check the values programmed in each unit;
  → Example: Display format different from one unit to the other.
  → Example: System of 4 units, but only 2 detected or connected.

```
ERROR   DETECTED
ERROR   PROGRAM
```

- programmed position of units incorrect.
  → Lead unit (#1) not programmed.
  → 2 or more units are programmed with the same address.

```
ERROR   DETECTED
ADDRESS   OK
```

11. Spare parts

11.1. Valve parts list
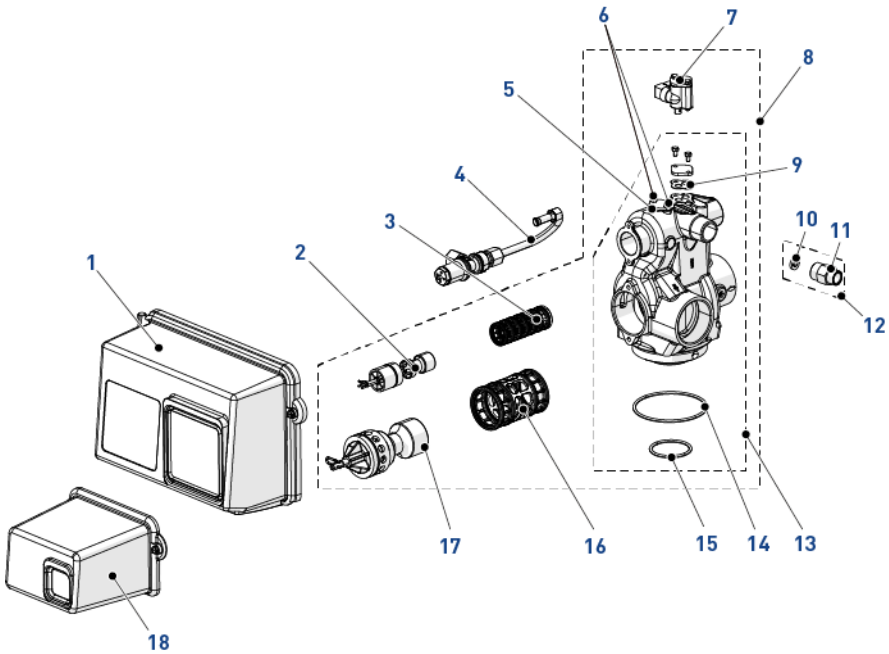
Item	Part number	Description	Assembly quantity	Min. order quantity
1	VCPHINDUS1	Power head 2510/2750/2850/2910 See 11.2. Lower power head parts list, page 100	1	1
2	28416	Piston assy 2910 upper DF	1	1
-	28417	Piston assy 2910 upper UF	1	1
3	28415	S&S kit upper	1	1
-	BU28414	S&S kit 2750/29100/2910 upper HW	1	1
4	-	Brine valve See 11.4. Brine valves list, page 102	1	1

Item	Part number	Description	Assembly quantity	Min. order quantity
5	11893SP	Injector flat cover	1	50
6	24874SP	Screw THM 5x8 inj	2	50
7	-	Injector See 11.8. Safety brine valves list, page 107	1	1
8	BU28515-01	Valve body assy 2910 DF	1	1
-	BU28515-02	Valve body assy 2910 DF/NBP	1	1
-	BU28515-03	Valve body assy 2910 DF HW	1	1
-	BU28515-04	Valve body assy 2910 DF/NBP HW	1	1
-	BU28515-05	Valve body assy 2910 UF	1	1
-	BU28515-06	Valve body assy 2910 UF/NBP	1	1
9	19925SP	Gasket injector block	1	10
10	16735SP	Flow washer 12 gpm	1	5
-	16736SP	Flow washer 15 gpm	1	5
-	16737SP	Flow washer 25 gpm	1	5
11	16738SP	Flow control retainer	1	10
12	25581-ALL	DLFC kit 1" 2850/9500 10 to 25 gpm	1	1
13	28411	VB 2910 without o-ring	1	1
14	13575-01SP	O-ring 560 CD top of tank	1	5
15	13577-01SP	O-ring 560 CD distributor tube	1	10
16	24205	S&S kit 2900/2910 lower	1	1
-	26107	S&S kit 2900/2910 lower HW	1	1
17	BU28412	Piston assy lower 2900/2910 WBP Std & HW	1	1
-	BU28413	Piston assy lower 2900/2910 NBP Std & HW	1	1
18	PH2910-001	Power head adapter 2910 adapt 24V/50Hz 1 Msw	1	1
-	PH2910-002	Power head adapter 2910/2910 adapt NXT 24V/50Hz	1	1
-	PH2910-006	Power head adapter 2910 230V no controller	1	1

11.2. Lower power head parts list
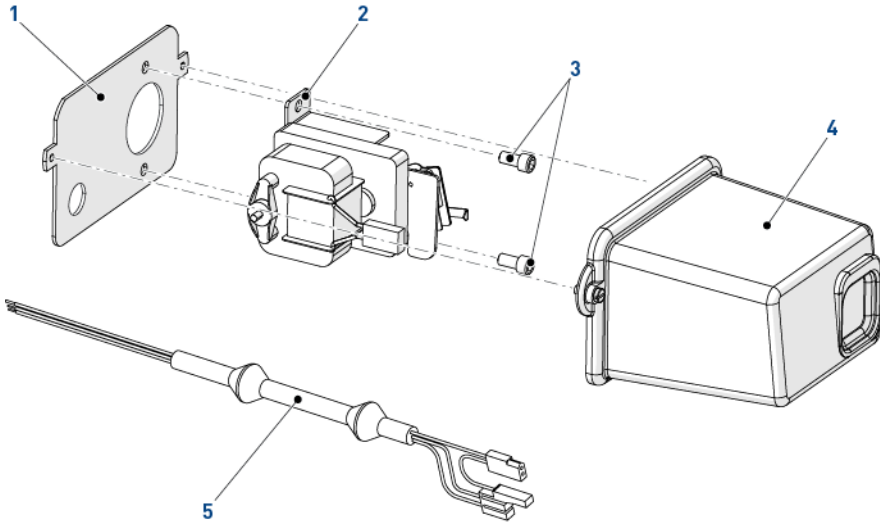
Item	Part number	Description	Assembly quantity	Min. order quantity
1	18709-50	Back plate 2900/2910 Lower	1	1
2	18357-01	Motor assy 2910 adapt 24V	1	1
3	21361SP	Screw TCHCM 8x16	2	50
4	26218-01	Cover assy 2900/2910 lower grey	1	1
5	40943	Harness 3200 NXT lower	1	1

11.3. Upper power head parts list
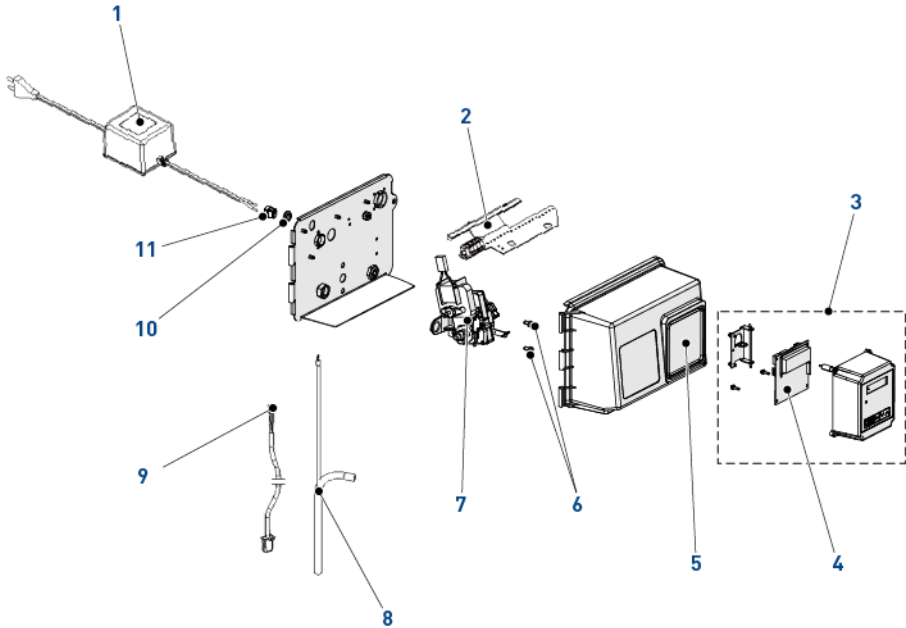
Item	Part number	Description	Assembly quantity	Min. order quantity
1	26260	Transformer 60VA	1	1
-	11545	Power cord European black	1	1
3	BU28713	Controller assy NXT	1	1
4	BR61702-03	Circuit board NXT	1	1
-	28008	Harness pulse controller 3230 (not shown)	1	1
-	40400	Harness motor ex 11667 (not shown)	1	1
-	40422SP	Wire nut tan (not shown)	1	50
-	40941	Harness upper drive NXT (not shown)	1	1
5	26217-01	Cover assy grey - clear window	1	1
6	10231SP	Screw hex head industrial	2	50
7	27204-31	Drive motor assy 2910 DF 24V	1	1
-	27927-31	Drive motor assy 24V/50Hz 2910 UF	1	1
8	25351	Guide cable & cable assy	1	1
9	28114-06	Meter cable NXT 0.7 m	1	1
-	28114-08	Meter cable NXT 2.5 m (Std kit NXT)	1	1
-	28114-09	Meter cable NXT 7.7 m	1	1
10	28704SP	Plug	1	10
11	13547SP	Strain relief 24V	1	50

11.4. Brine valves list
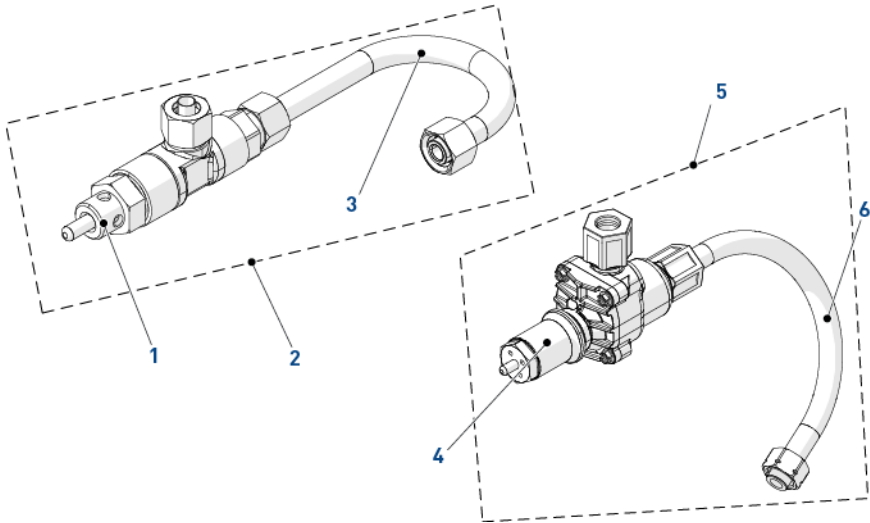
Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
1	1600/1650	11749	Brine valve 1600/1650 stem guide	1	1
2	1600	24994-0.25	Brine valve 1600 assy DF HW 0.25 gpm	1	1
-		24994-0.5	Brine valve 1600 assy DF HW 0.50 gpm	1	1
-		24994-1	Brine valve 1600 assy DF HW 1.00 gpm	1	1
-	1650	BU28797-0.25	Brine valve 1650 assy DF 0.25 gpm	1	1
-		BU28797-0.5	Brine valve 1650 assy DF 0.50 gpm	1	1
-		BU28797-1	Brine valve 1650 assy DF 1.00 gpm	1	1
-		BU28807-0.25	Brine valve 1650 assy UF 0.25 gpm	1	1
-		BU28807-0.5	Brine valve 1650 assy UF 0.50 gpm	1	1
-		BU28807-1	Brine valve 1650 assy UF 1.00 gpm	1	1
-	1600/1650	08092-1	Kit brine valve BLFC assy industrial	1	1
3	1600	12774-01	Plastic brine tube DF	1	1
-	1650	16508-01	Plastic brine tube DF	1	1
-		41683	Plastic brine tube UF	1	1
4	1700/1710	17906SP	Stem guide BV	1	10

Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
5	1700	26991-1.2	Brine valve 1700 assy HW DF 1.20 gpm	1	1
-		26991-2.0	Brine valve 1700 assy HW DF 2.00 gpm	1	1
-		26991-4.0	Brine valve 1700 assy HW DF 4.00 gpm	1	1
-		26991-7.0	Brine valve 1700 assy HW DF 7.00 gpm	1	1
5	1710	BU28610-1.2	Brine valve 1710 assy DF 1.20 gpm	1	1
-		BU28610-2	Brine valve 1710 assy DF 2.00 gpm	1	1
-		BU28610-4	Brine valve 1710 assy DF 4.00 gpm	1	1
-		BU28610-7	Brine valve 1710 assy DF 7.00 gpm	1	1
-		BU28614-1.2	Brine valve 1710 assy UF 1.20 gpm	1	1
-		BU28614-2	Brine valve 1710 assy UF 2.00 gpm	1	1
-		BU28614-4	Brine valve 1710 assy UF 4.00 gpm	1	1
-		BU28614-7	Brine valve 1710 assy UF 7.00 gpm	1	1
6	1700	BU28493	Copper brine tube DF	1	1
-	1710	41447	Plastic brine tube UF	1	1
-		BR16460	Plastic brine tube DF	1	1

11.5. Injectors list

1600/1650   **1700/1710**

DF   **UF**   **DF**   **UF**
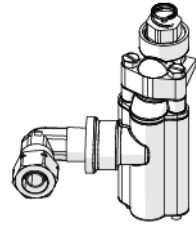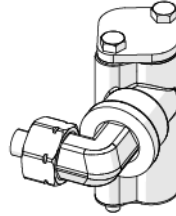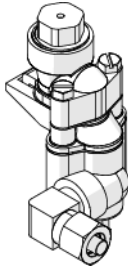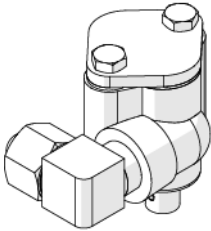
Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
	1600	24555-3	Inj 1600 assy HW DF # 3	1	1
		24199-3	Inj 1650 assy DF # 3	1	1
	1650	26840-2	Inj 1650 assy UF # 2	1	1
		26840-3	Inj 1650 assy UF # 3	1	1
	1700/ 1710	24173-3	Inj 1700/1710 assy CW/HW DF #3C	1	1
		24173-4	Inj 1700/1710 assy CW/HW DF #4C	1	1
		24173-5	Inj 1700/1710 assy CW/HW DF #5C	1	1
	1700	28422-6	Inj 1700 assy HW DF #6C	1	1
		28422-7	Inj 1700 assy HW DF #7C	1	1
		26841-3	Inj 1710 assy UF #3C	1	1
	1710	26841-4	Inj 1710 assy UF #4C	1	1
		26841-5	Inj 1710 assy UF #5C	1	1
		26841-6	Inj 1710 assy UF #6C	1	1

11.6. 1600/1650 injector parts list
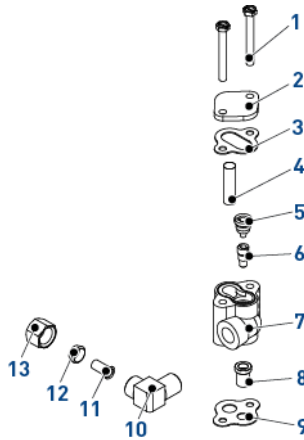
Item	Part number	Description	Assembly quantity	Min. order quantity
1	10692SP	Screw	2	50
2	11893SP	Inj cover	1	10
3	10229SP	Inj body gasket	1	10
4	10227SP	Inj screen	1	10
5	10913-2SP	Inj nozzle #2	1	10
-	10913-3SP	Inj nozzle #3	1	10
6	10914-2SP	Inj throat #2	1	10
-	10914-3SP	Inj throat #3	1	10
7	17776	Inj body	1	1
8	16221SP	Air disperser	1	10
9	23304SP	Inj body gasket	1	10
10	10328	Male elbow	1	1
11	10332SP	Insert sleeve 3/8"	1	50
12	10330SP	Delrin sleeve 3/8"	1	50
13	10329SP	Fitting nut 3/8"	1	10

11.7. 1700/1710 injector parts list
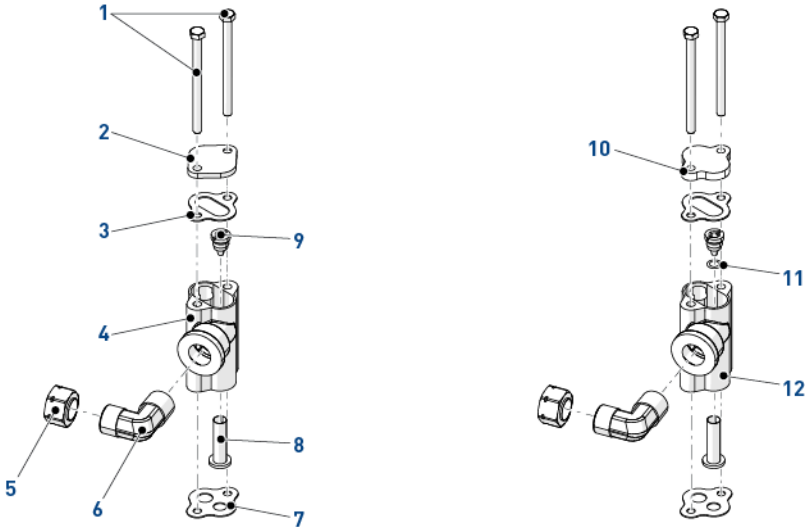
Item	Part number	Description	Assembly quantity	Min. order quantity
1	23477SP	Screw	2	50
2	11893SP	Inj cover	1	10
3	10229SP	Inj body gasket	1	10
4	17777-03	Inj body 3C-5C	1	1
5	15414	Nut and sleeve assy	1	1
6	15413	Male elbow	1	1
7	23304SP	Inj body gasket	1	10
8	14802-03CSP	Inj throat 3C	1	10
-	14802-04CSP	Inj throat 4C	1	10
-	14802-05CSP	Inj throat 5C	1	10
-	14802-06CSP	Inj throat 6C	1	10
-	14802-07CSP	Inj throat 7C	1	10

Item	Part number	Description	Assembly quantity	Min. order quantity
9	14801-03CSP	Inj nozzle 3C	1	10
-	14801-04CSP	Inj nozzle 4C	1	10
-	14801-05CSP	Inj nozzle 5C	1	10
-	14801-06CSP	Inj nozzle 6C	1	10
-	14801-07CSP	Inj nozzle 7C	1	10
10	10228SP	Inj cover	1	10
11	13771SP	O-ring	1	50
12	17777-03	Inj body 6C-7C	1	1

11.8. Safety brine valves list

2300 **2310** **2350** **BV 44**
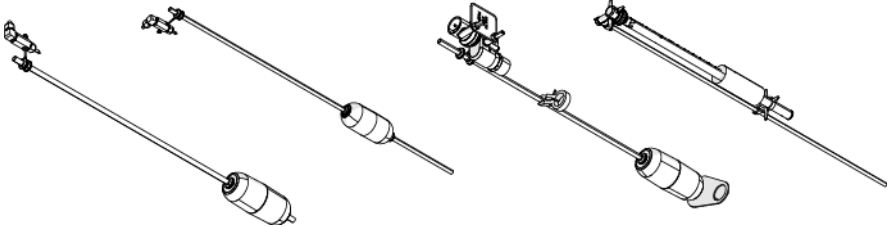
Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
-	1600	27833	Safety brine valve 2300 - without air-check	1	1
-		27834	Safety brine valve 2300 - HW - without air-check	1	1
-		60067-03	Safety brine valve 2310 - without air-check	1	1
-		25687	Brine valve 44 - 914mm	1	1
-		18961	Brine valve 44 - 1250mm	1	1
-	1710	25453	Safety brine valve 2350 - without air-check	1	1
-		25364	Mounting part 1" NPT male x $^3/_8$" female	1	1

11.9. Kit meter & Meter cables list

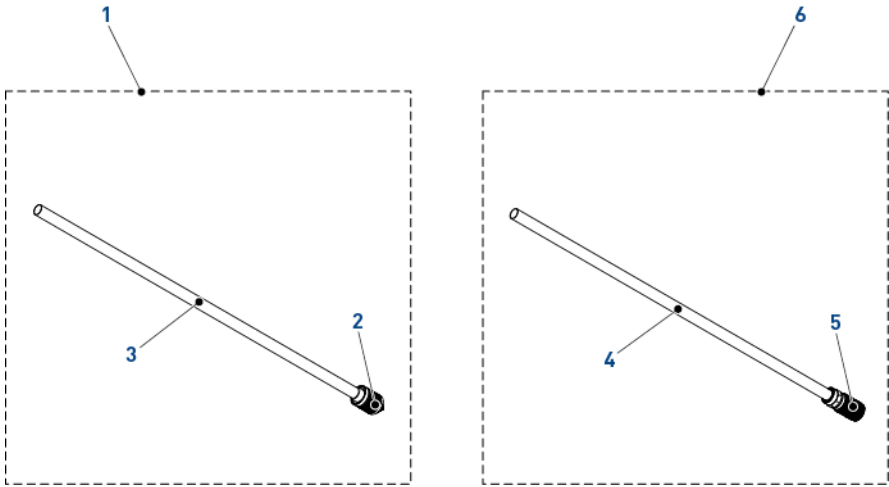| Item	Part number	Description	Assembly quantity	Min. order quantity
-	28283	Kit meter NT - NXT 1" brass	1	1
-	28284	Kit meter NT - NXT 1½" brass	1	1
-	28285	Kit meter NT - NXT 2" brass	1	1
-	28295	Kit meter NT - NXT 2" plastic	1	1
-	28286	Kit meter NT - NXT 3" brass	1	1
-	28461-04	In-line meter 1¼" BSP plastic	1	1
-	28114-06	Meter cable 0.7 m	1	1
-	19121-09	Meter cable 2.5 m (delivered with each meter kit)	1	1
-	19121-10	Meter cable 7.7 m	1	1

11.10. Air checks list

500   **500A**   **900**
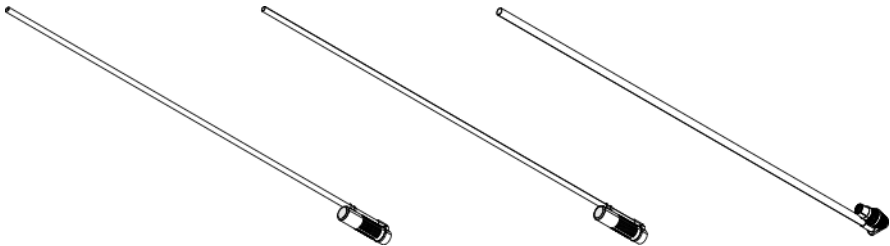
Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
1		18168	Air check 500A - 915mm (36")	1	1
-	1600	26773	Air check 500A - 1m25	1	1
2		23473	Air check 500 - HW	1	1
3	1710	18979	Air check 900 - 1m88	1	1
-		BU28510	Air check 900 - 1m10	1	1

11.11. Distributors list

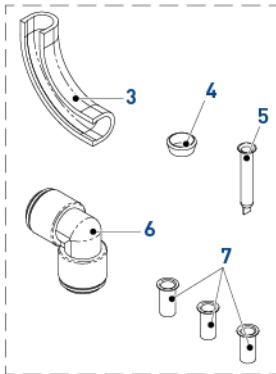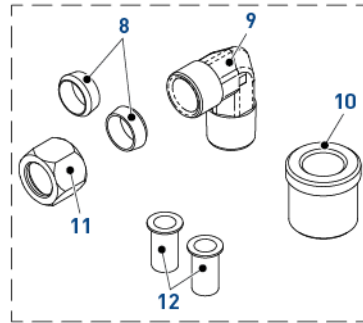| Item	Part number	Description	Assembly quantity	Min. order quantity
1	18404	2" assy 1m82	1	1
2	18396	2" distributor	1	1
3	BU28649	2" tube 1m66	1	1
4	21148HW	2" tube HW 1m66	1	1
5	26050	2" distributor HW	1	1
6	BU26052	2" assy HW 1m82	1	1

Other components list

Mixing assembly
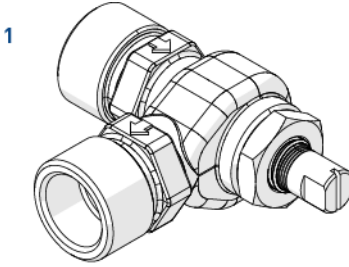
**Rotating Side Mount Adapter**
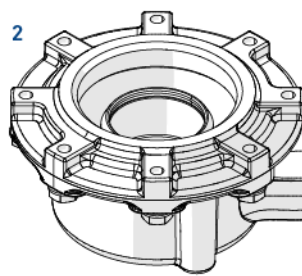
Kit 51

Kit 57

Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
1	1600/ 1710	BU61564-10	Mixing assy 1" industrial	1	1
2		61415-20	Rotating side mount adapter	1	1
3		24575SP	Tube guide	1	10
4		10330SP	Sleeve $^3/_8$"	1	50
5	1600/ 1650	12767SP	Filter	1	10
6		12794-01SP	Elbow $^3/_8$"	1	10
7		10332SP	Insert tube $^3/_8$"	3	50

Item	Brine System	Part number	Description	Assembly quantity	Min. order quantity
8		16124SP	Sleeve ½"	2	50
9		15413	Male elbow ½"	1	1
10	1700/ 1710	23804	Fitting $^3/_8$"	1	1
11		16123SP	Nut ½"	1	10
12		15415SP	Insert tube ½"	2	10

11.12. CE compliance parts list
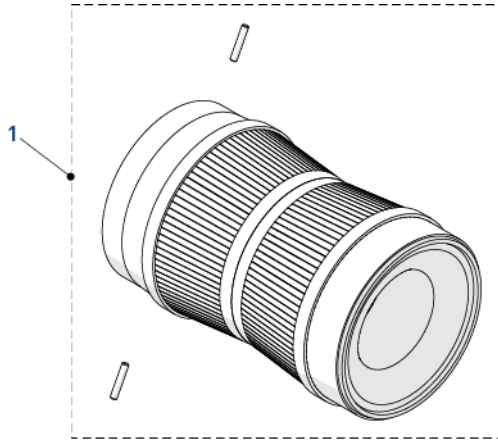
Item	Part number	Description	Assembly quantity	Min. order quantity
1	Kit 8	Top distributor 2" & pin assy	1	1

12. Disposal

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 center 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 does not collect used product for recycling. Contact your local recycling center for more information.

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