PENTAIR

FLECK 3150 NXT

INSTALLER MANUAL

WATER PURIFICATION

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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	Author	Description
A	09.12.2016	BRY	First edition

1.3. Manufacturer identifier, product

Manufacturer: Pentair Manufacturing Italy Srl
Via Masaccio, 13
56010 Lugnano di Vicopisano (PI) – Italy
Product: Fleck 3150 - 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

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

1.6. Norms

1.6.1. Applicable norms

Comply with the following guidelines:

- DM174: "Regulation of materials and objects that can be used in stationary collection, treatment, supply and distribution of water intended for human consumption.";
- 2006/42/EC: Machinery Directive;
- 2014/35/UE: Low Voltage Directive;
- 2014/30/UE: Electromagnetic compatibility;
- 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. Location of safety label, page 10 and 9.1. Recommendations, page 73);
→ Description of the device problem.

B Please refer to the "Troubleshooting" chapter, page 74. If the problem persists contact your supplier.

1.8. Copyright

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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.

2. Safety

2.1. Safety pictograms definition

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

Warning
Warns against serious personal injury and damage to health.

Danger
Warns against serious personal injury or death.

Mandatory
Standard or measure to apply.

Note
Comment

Prohibition
Restriction to be observed.

2.2. Location of safety label

Note
Ensure that 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 69.
- 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) ..... 22.8 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..... 0 - 50°C

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

Continuous (Δp = 1 bar) ..... Top Mount 22.0 m^3/h; Side Mount 23.0 m^3/h
Peak (Δp = 1.8 bar)..... Top Mount 28.0 m^3/h; Side Mount 29.0 m^3/h
Cv*..... 24.8
Kv*..... 21.5
Maximum backwash (Δp = 1.8 bar) ..... Top Mount 24.0 m^3/h; Side Mount 25.0 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"8 thread UN
Side mount adapter ..... 2" BSP female
Inlet/Outlet ..... 2" BSP female
Distributor pilot ..... 63 mm [DN50]
Drain line ..... 2" BSP
Brine line (1800)..... 1" NPT male

Electrical

Controller operating voltage ..... 24 VAC
Input supply frequency ..... 50/60 Hz
Transformer voltage..... 24 VAC
Motor input voltage..... 24 VAC
Controller power consumption ..... 60 W
Controller protection rating ..... IP 22
Valve protection rating ..... IP 44
Power supply ..... 230 VAC, 50/60 Hz,60 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.

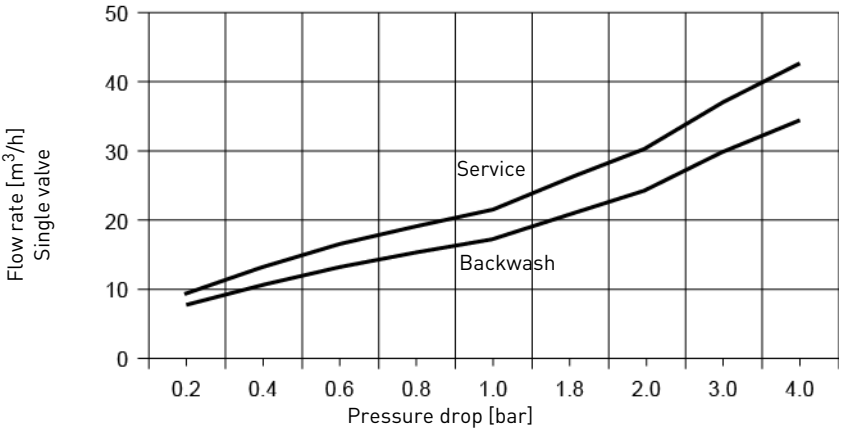
Warning
It is required the installation of a fuse as overcurrent protection, it has to be positioned between the system and the secondary of the transformer in the installation with the following characteristics: V>= 30Vac, Imax=5.0A (ES. 5x20 5.0A)

Environmental conditions

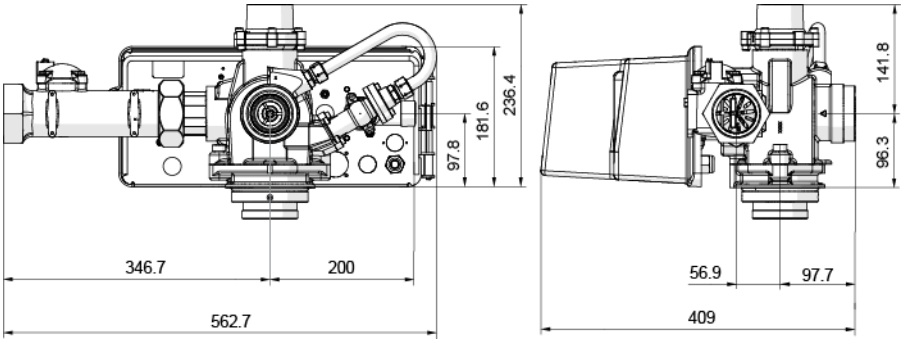
- Indoor use only;
- Temperature from 0°C to 50°C;
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C;
- Mains supply voltage fluctuations up to ±10% of the nominal voltage.

3.1.1. Performance flow rate characteristics

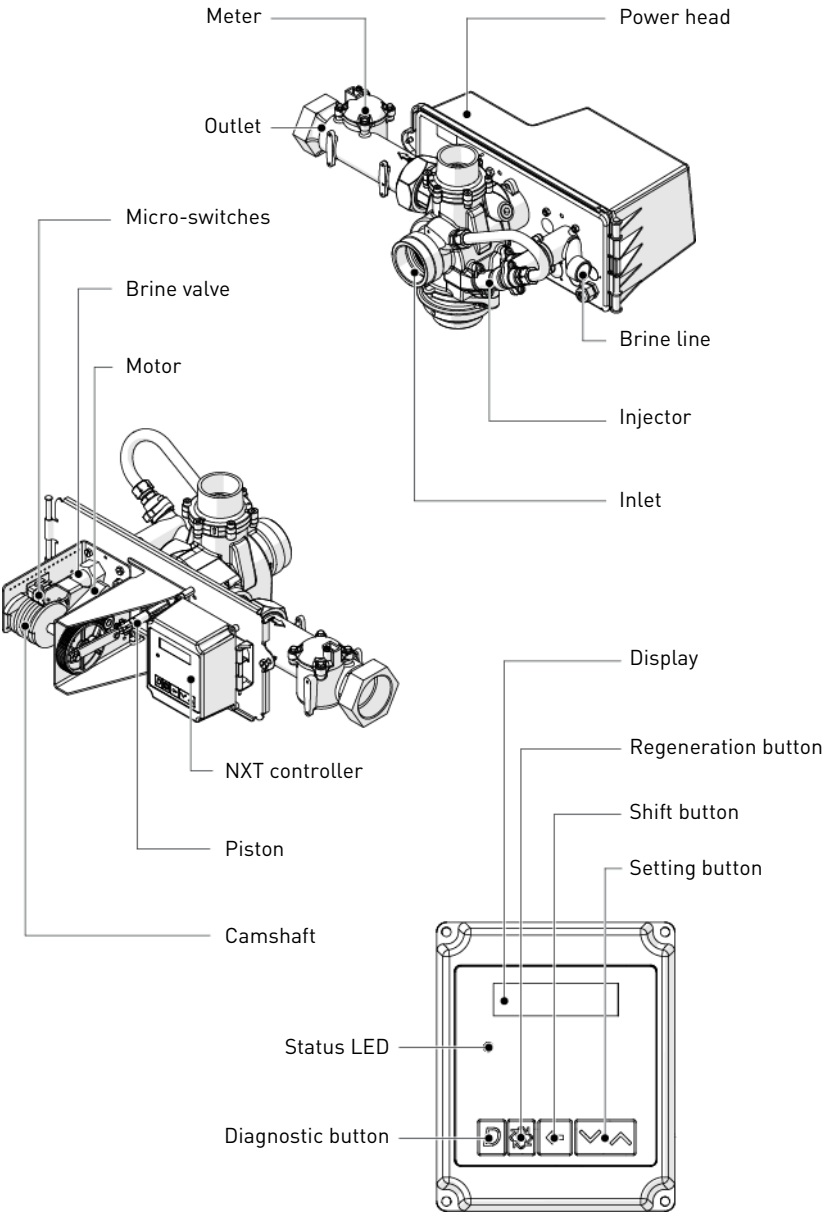
The graph shows the pressure drop created by the valve itself at different flow rates. It allows predetermining the maximum flow rate going through the valve depending on the system settings (inlet pressure etc). It also allows to determine the valve pressure drop at a given flow rate, and therefore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



3.2. Outline drawing



3.3. Components description and location



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.

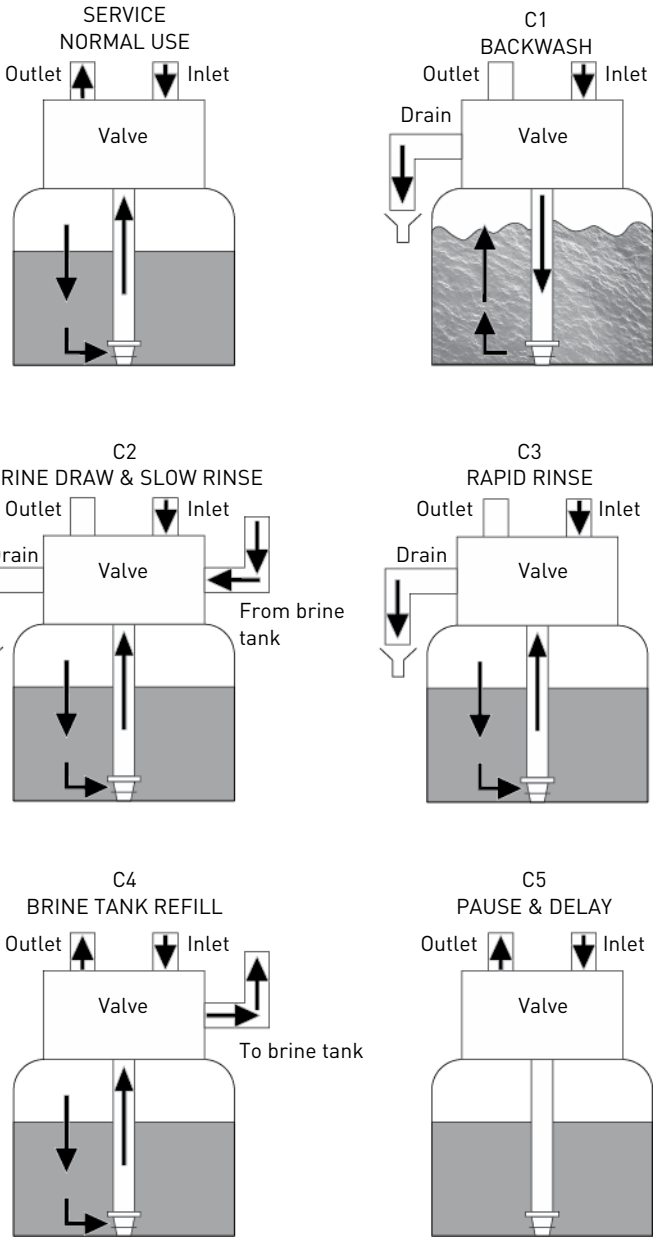
Rapid rinse — cycle C3
The valve directs water down through the resin bed and up through the riser tube to the drain. Any residual brine is rinsed from the resin bed, while the media bed is re-compacted.

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.



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.

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

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 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.

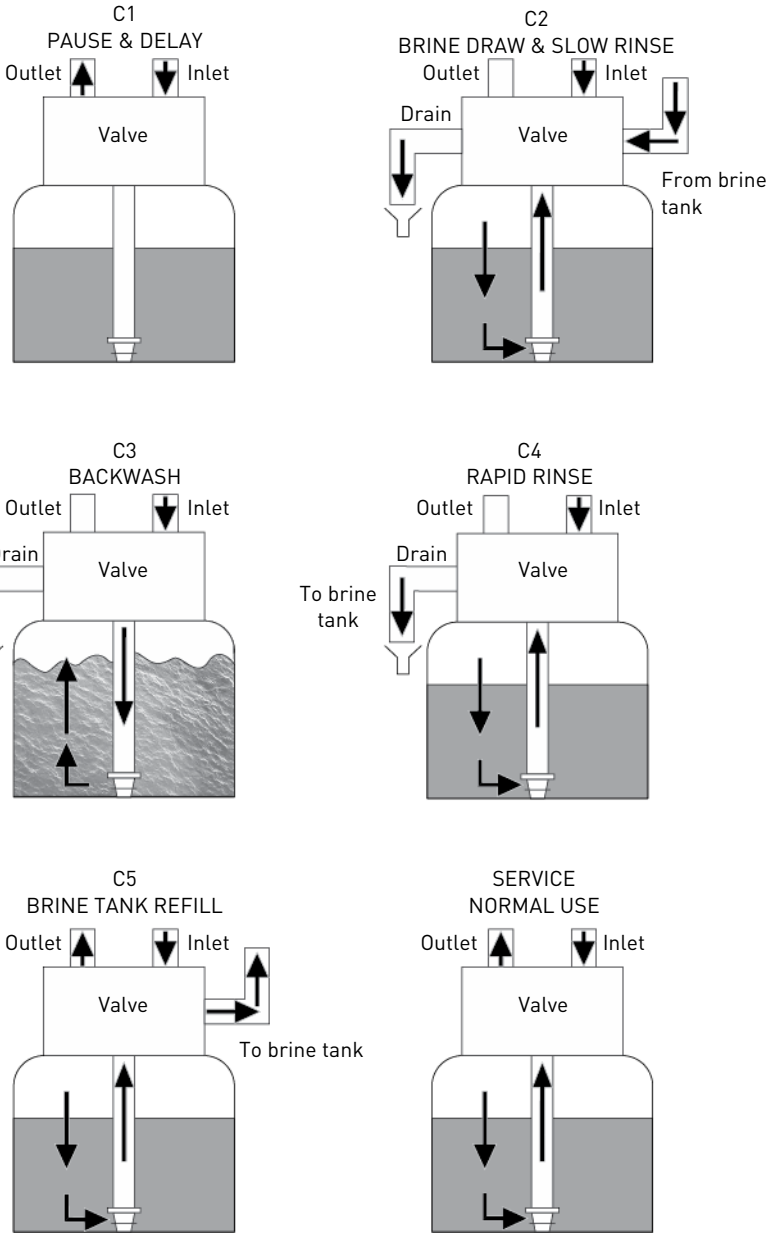
Rapid rinse — cycle C4

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

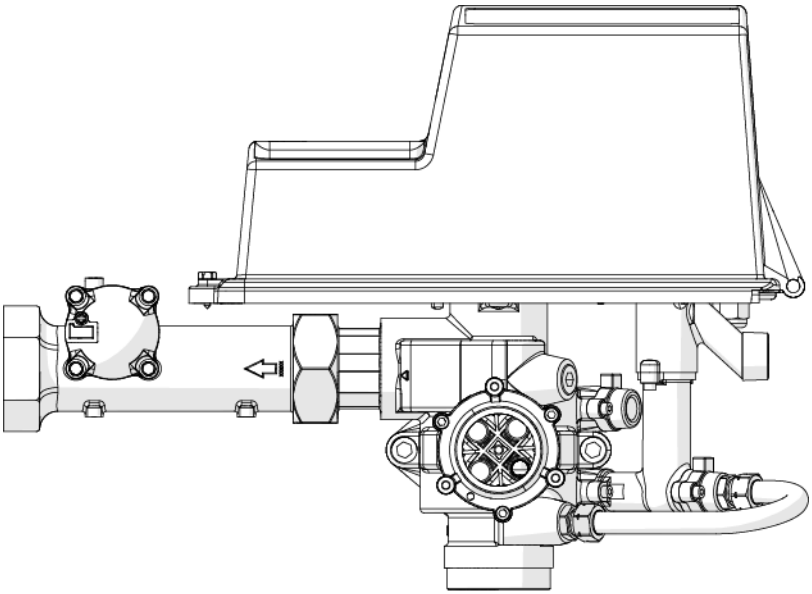
Water is directed to the brine tank, at a rate controlled by the refill controller, to create brine for the next regeneration. During brine refill, treated water is already available at the valve outlet.

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

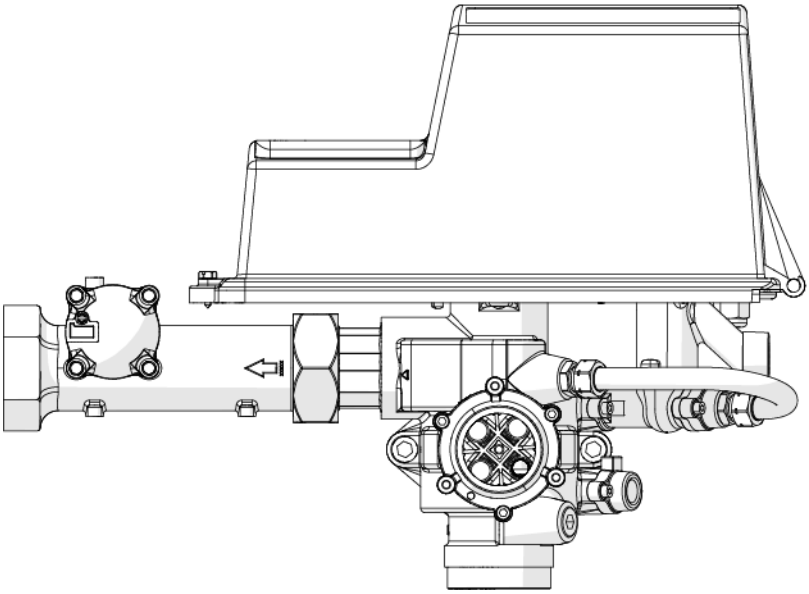


3.5. Injector block position for DF and UF configurations

DF



UF



4. System sizing

4.1. Recommendations

4.1.1. Injector/DLFC/BLFC-Valve configuration

Brine syst.	Tank Diameter	Resin volume	Injector				DLFC	BLFC	
	[in]	L	DF	Color	UF	Color	[gpm]	DF [gpm]	UF [gpm]
3150/ 1800	24	283 - 424	4	Green	4	Green	20.0	5.0	5.0
	30	284 - 425	5	Red			25.0		
	36	426 - 605	6	White	5	Red	35.0		
	42	566 - 850	7	Blue	6	White	50.0	10.0	10.0
	48	851 - 1200	8	Yellow	7	Blue	70.0		
	54	1201 - 1550	9	Purple	8	Yellow	80.0		
	60	1551 - 2000	10	Black			100.0		

4.2. Sizing a softener (single unit)

4.2.1. Parameter to be considered

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

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

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

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

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

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

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

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

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

Piping size (external 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.

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 de kept as free space so that the bed expansion during backwash is sufficient to ensure correct cleaning of the resin.

4.2.3. Resin exchange capacity and capacity of the unit

The resin exchange capacity and capacity of the unit are two different things 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 and the tank size, 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 unit 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 2 next tables are showing the resin exchange capacity in function of the amount of salt for a system with standard efficiency regeneration and for a system with high efficiency regeneration.

Resin exchange capacity as a function of the salt dosage:

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

To calculate the system mass capacity:

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

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

To calculate the system combined capacity:

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

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

To calculate the system volume capacity:

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

or

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

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

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

Caution
If a mixing device is set on the valve, the inlet water hardness will need to be adjusted upon the actual outlet residual hardness setup.

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

4.2.4. Valve configuration

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

To determine the backwash flow rate:

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

with:
$Q_{backwash}$: backwash flow rate [m^3/h]
$Fs_{backwash}$: backwash velocity [m/h]
S : 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 4BV / h (corresponding to the flow rate of brine being drawn added to the flow rate of raw water passing through the injector nozzle to create the suction effect).

Q_{Inj} = 4 x BV / h

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

Note
This value does not correspond to the brine draw flow rate but to the total flow rate passing through the injector. Then refer to the injector diagrams for the chosen tank size and at the inlet pressure in order to check if the injector will give a correct flow rate. See "1800 injector flow rates (tables & graphics)", page 28.

4.2.5. Cycle time calculation

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

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

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

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

To calculate the backwash duration:

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

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

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

To calculate the brine draw duration:

Knowing the injector flow rate at the working pressure, see "1800 injector flow rates (tables & graphics)", page 28:

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

with:
$T_{brine\ draw}$: brine draw duration [min]
V_{brine} : brine volume to be drawn [L], see Refill calculation page 28
Q_{inj} : injection flow rate [L/min]

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

To calculate slow rinse duration:

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

Refer to the injector curve at the common working pressure to determine the slow rinse duration, see "1800 injector flow rates (tables & graphics)", page 28.

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

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

To calculate fast rinse duration:

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

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

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

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

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 flow rate [L/min]

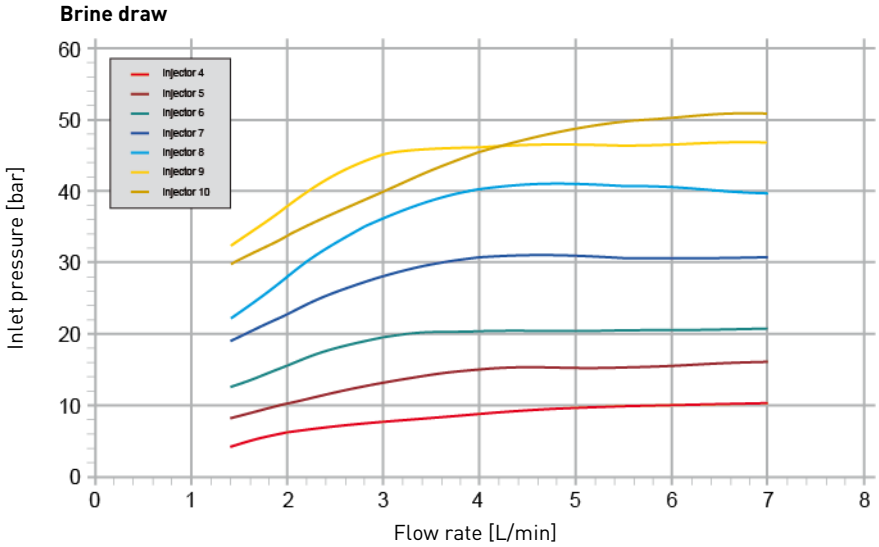
$V_{WB} = D_{Salt} \times BV / S_{sol}$

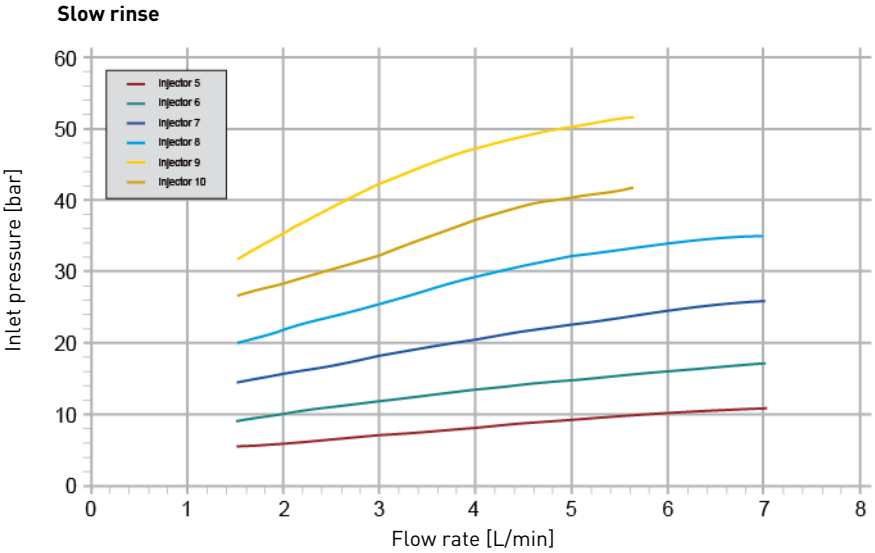
with:
V_{WB}: Volume of water to be refill to prepare the brine [L]
D_{Salt} : Salt dosage per litre of resin [gr/L]
BV: Bed volume [L]
S_{sol}: 360gr/L - Solubility of salt per litre of water

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 water refilled.

4.3. 1800 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. Defining salt quantities

The salt settings are controlled through the controller programming. See 4.2.3. Resin exchange capacity and capacity of the unit, page 23.

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. Be sure to disconnect the electrical power, close the water inlet and depressurize the system before opening the front cover to access internal parts.

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 version, 65°C for volumetric hot water version and 82°C for time clock hot water version.
- 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 adapter, 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 adapter that is supplied.

Mandatory
The use of any other power adapter 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 adapter 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, 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

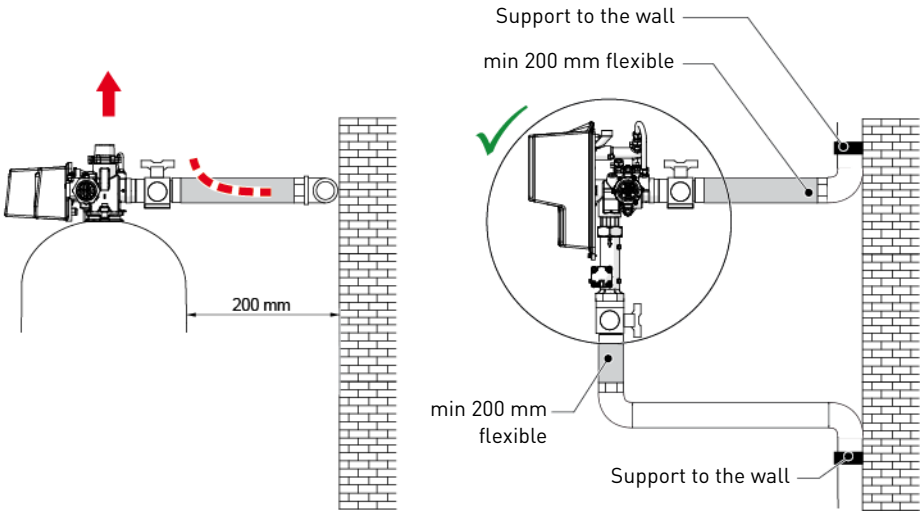
The connections should be hand tightened using PTFE (plumber's tape) on the threads if using the threaded connection type.
In case of heat welding (metal type connection), the connections should not be made to the valve when soldering.

Note
See chapter 3.3. Components description and location, page 15 to identify the connections.

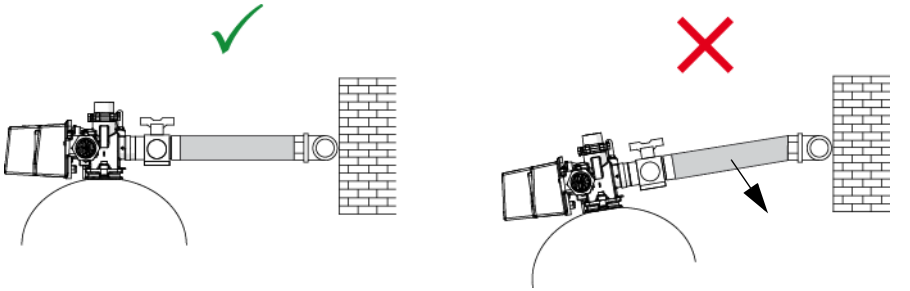
When pressurized, any composite tank will expand both vertically and circumferential. In order to compensate the vertical expansion, the piping connections to the valve must be flexible enough to avoid overstress on the valve and tank.

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 being 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 connect to the tank, or on the female thread connection of the tank that connect to the valve. In some cases, damage may also be seen on the valve inlet and outlet connections.

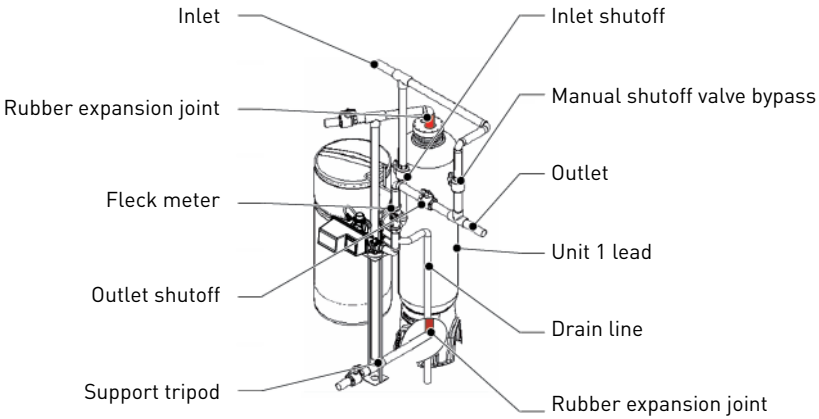


- In any case, any failure caused by improper installations and/or piping connections may void the warranty of Pentair products.
- In the same way, using lubricant* on the valve thread is not allowed and will void the warranty for the valve and tank. Indeed using lubricant there will cause the valve 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.

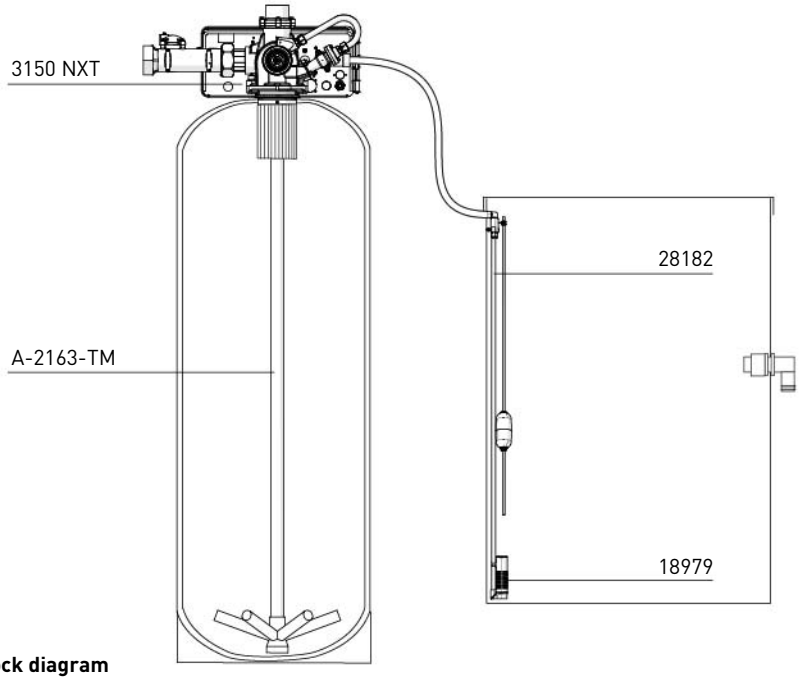
5.5.2. Side-mounted valve installation

Valid for location having a reduced height.

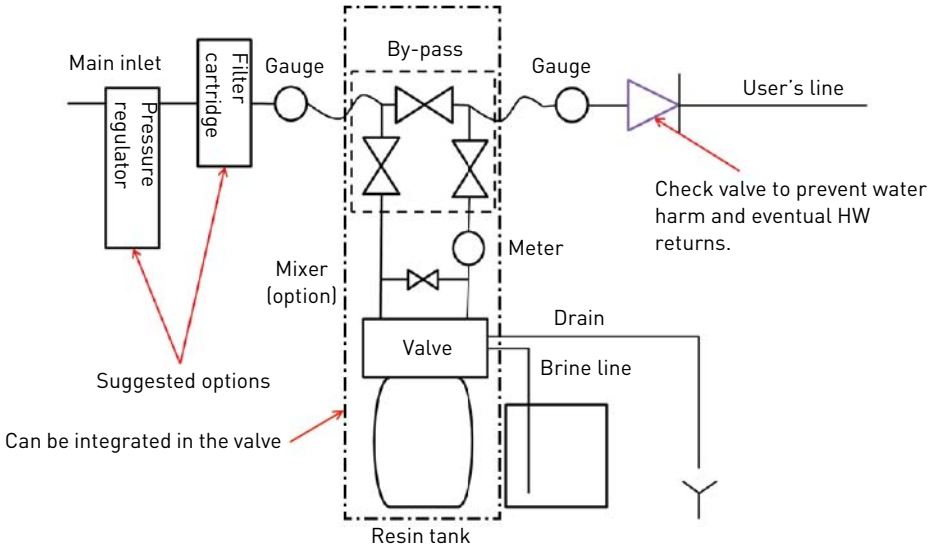


- To avoid the piping supporting the valve and side adapter weight, they must be fixed on a tripod or any other appropriate support.
- In order to adequately compensate the tank elongation, the rubber expansion joints must be mounted on the top and bottom of the tank. In red on the diagram above.

5.6. Block diagram and configuration example



Block diagram



5.7. Regeneration types

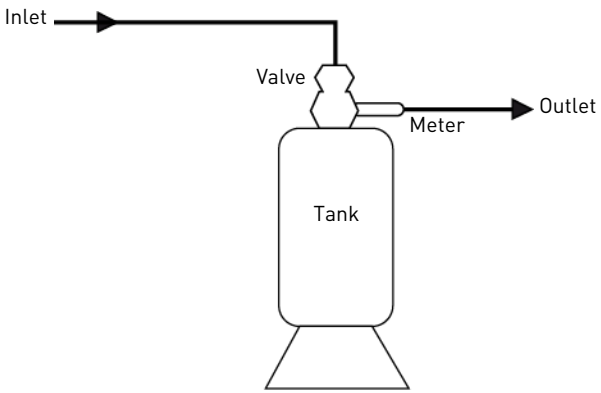
Metered:
The controller monitors the volume of water used. Once it calculates that there is not enough capacity for the next days of operation, a regeneration cycle will be initiated immediately or at a preset time.

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

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

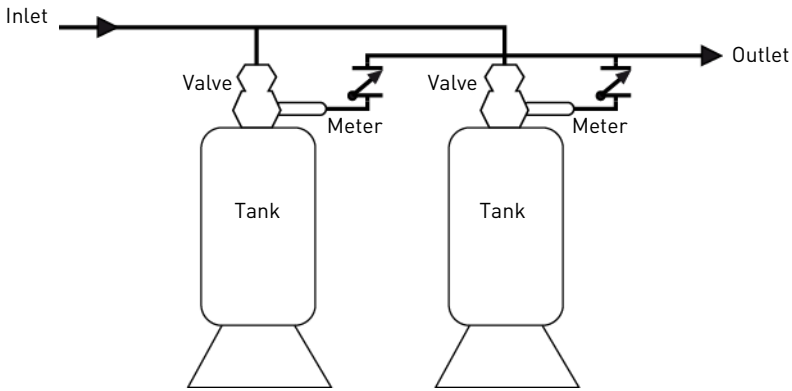
5.7.1. Single valve (System #4)

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)

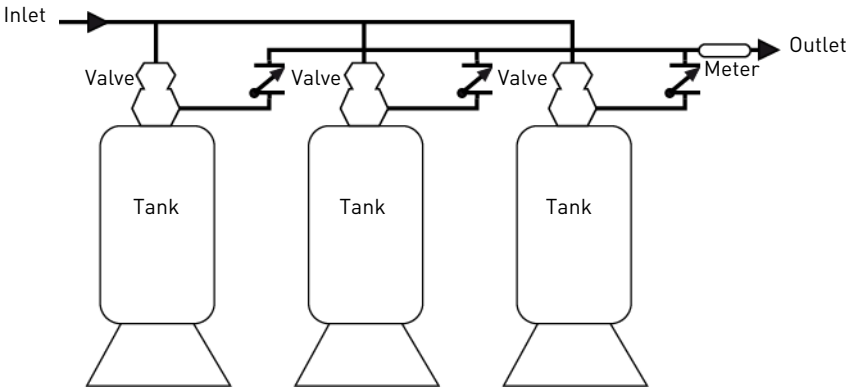
This system works with 2 to 4 valves.
All tanks in parallel are supplying treated water. Each unit in the system has its own flow meter. The controller will delay the start of regeneration if another unit is already regenerating. Once that unit has completed a regeneration cycle and returned to service, 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.

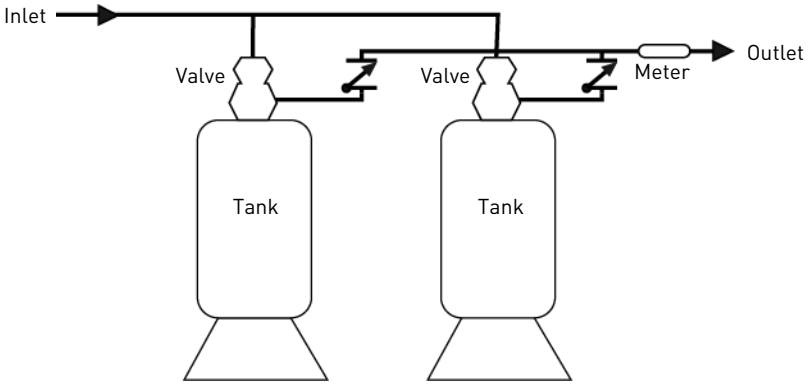
During normal operation, the controllers of each valve display the time of day and the volume of water remaining. The remaining volume is the total volume of the system. The remaining volume displayed drops with water consumption to reach zero. When this happens, if no other valve is regenerating, the 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.

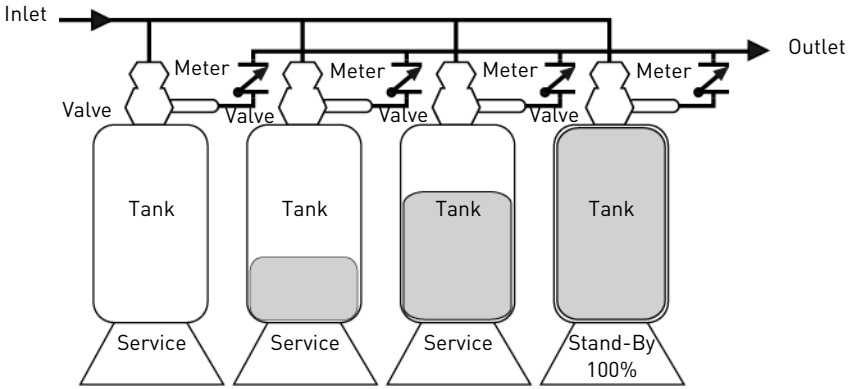
During normal operation, the controllers of each valve display the time of day and the volume of water remaining. The remaining volume displayed drops with water consumption to reach zero. When this happens, the regeneration starts immediately. The valve in service sends a signal to the valve in standby 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 5.9. Electrical connections), page 43) on the NXT circuit board.

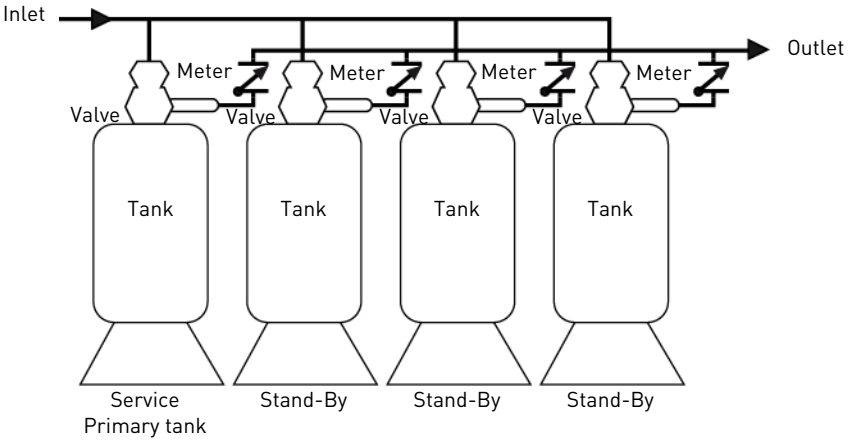


5.7.6. Multiple valves, demand (System #14)

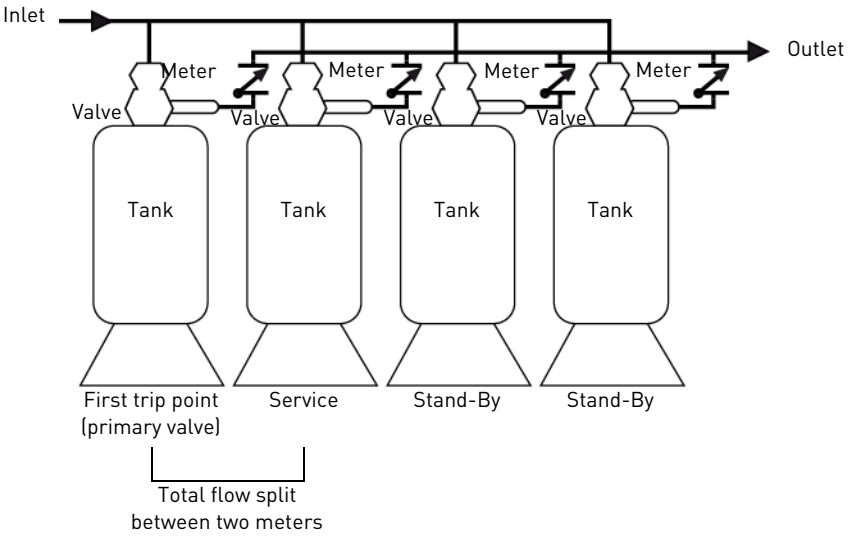
This system works with 2 to 4 valves and operates as part of a multi-tank regeneration system. Each tank in the system will have an active flow meter input, even in standby.
The number of tanks in service depends on the flow rate.

5.7.6.1 Examples of a four unit system

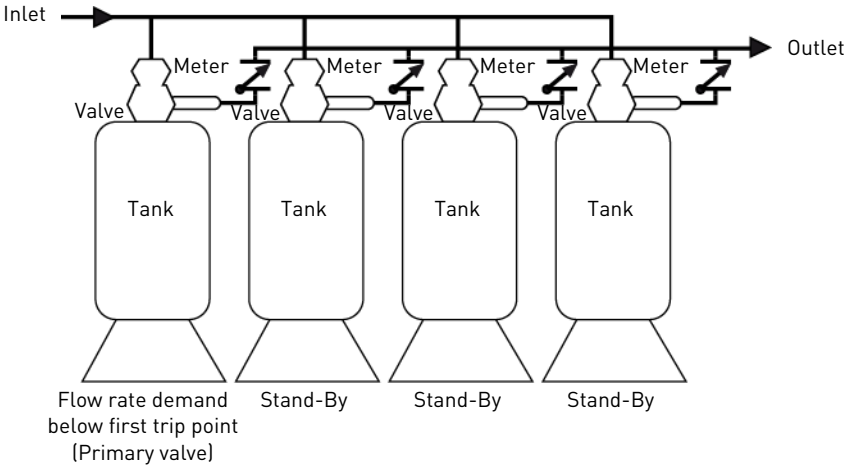
1. One tank is in service at all time (the "primary tank").



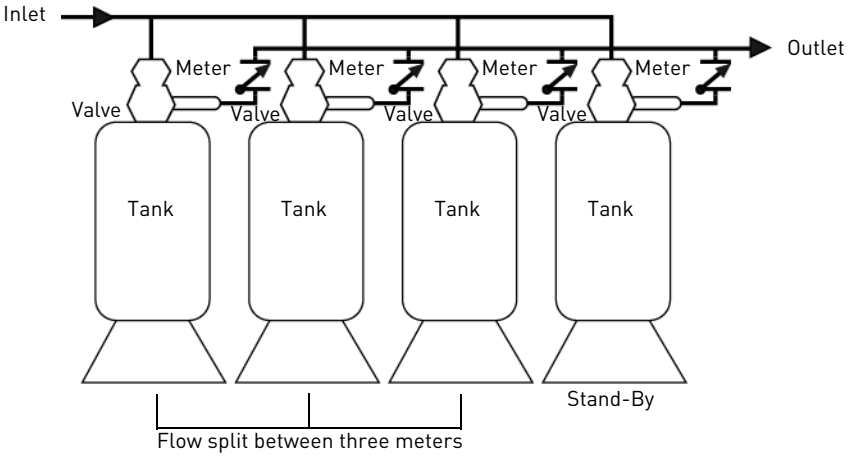
2. The total flow rate to the primary tank increase past the first trip point programmed rate. The flow rate demand stays past the trip point for the preset delayed time. The next tank (least volume remaining) changes from standby to in service. This then splits the total flow between two meters.



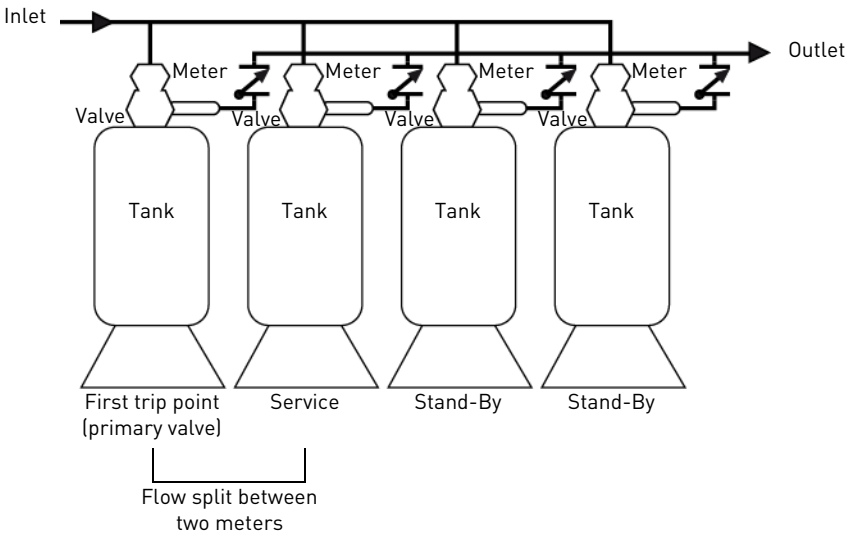
3. The flow rate demand decreased below the first trip point. The tank returns to standby.



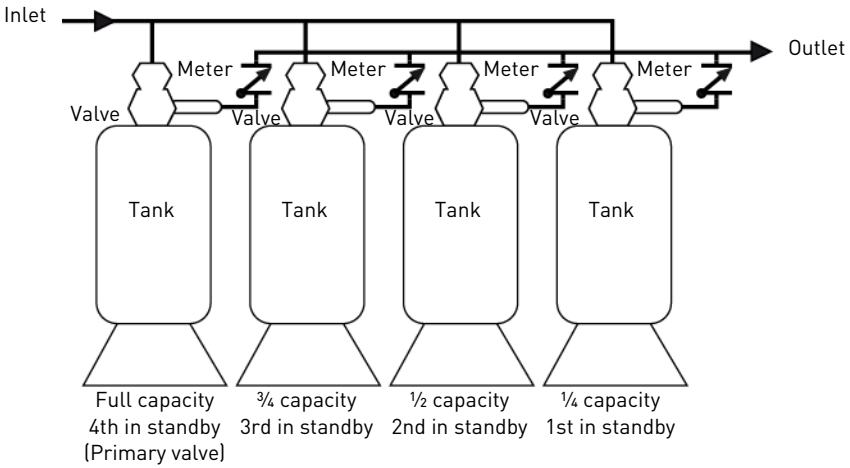
4. Total flow rate demand increased past a second trip point programmed rate. The second and third tank (least volume remaining) changes from standby to service. The total flow is split between three meters.



5. The third tank returns to standby as demand decreases past the second trip point.

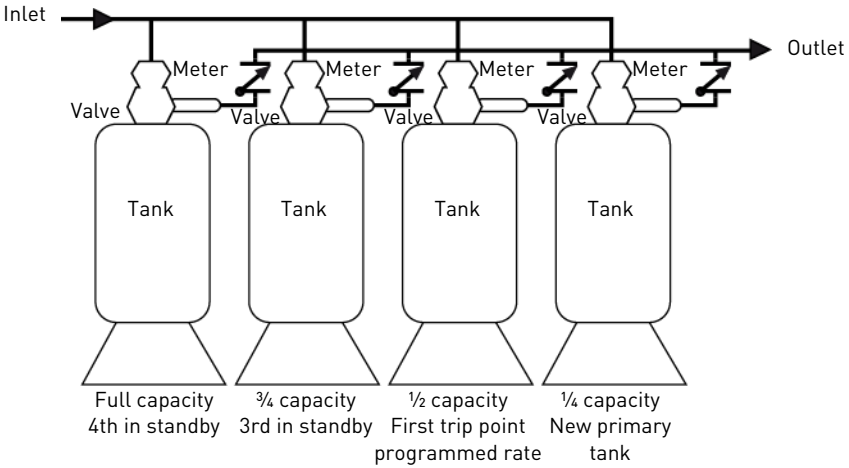


6. Tanks return to standby due to decreased total flow rate and trip points programmed. The tank with the most remaining volume will be the first to go into standby.



7. The primary tank regenerates. 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



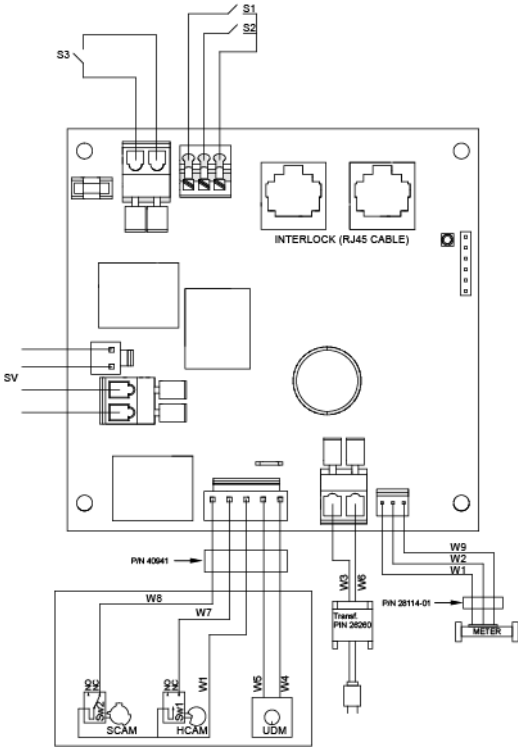
If two tanks are in service and both reach Volume remaining = 0, the other two tanks will shift from standby into service. The lead tank with Volume remaining = 0 will start regeneration. The second tank with Volume remaining = 0 will enter into standby. If the flow increases past the trip point, a third 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 15 to identify the connections.

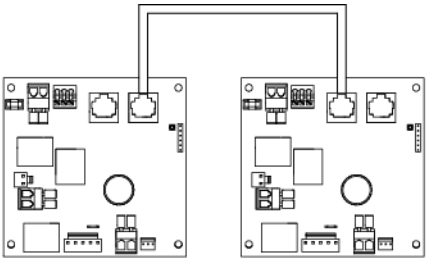
5.9. Electrical connections)



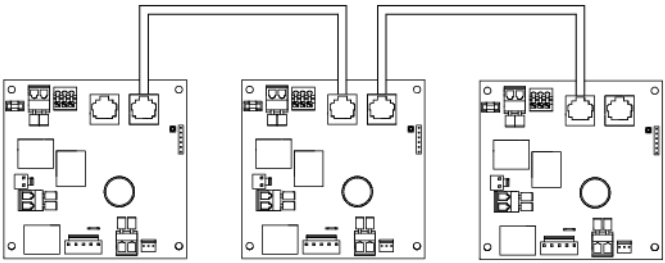
W1:	**Black**	**W7:**	**Orange**	**SCAM:**	**Cycles position cam**
W2:	**Red**	**W8:**	**Violet**	**HCAM**	**Home position cam**
W3:	**Brown**	**W9:**	**Green**	**SV:**	**Solenoid valve 24V-50/60Hz**
W4:	**Yellow**	**S1:**	**Inhibition signal**	**UDM:**	**Power head motor**
W5:	**White**	**S2:**	**Remote regen signal start**	**Sw1:**	**Home position switch**
W6:	**Blue**	**S3:**	**Aux. relay / Chemical pump**	**Sw2:**	**Cycles position switch**

5.9.1. Connections for multiple valves

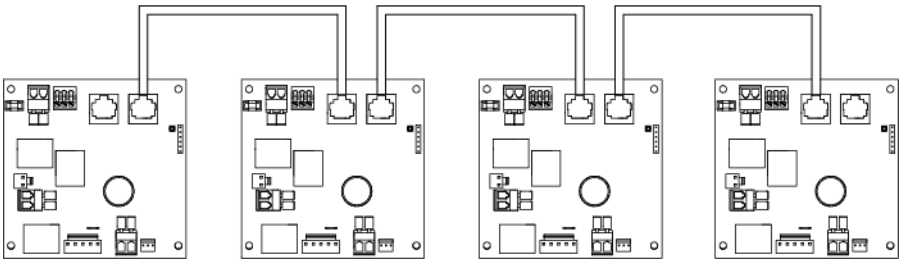
2 controllers NXT
Duplex system #5, #6, #7, #9 & #14



3 controllers NXT
Triplex system #5, #6, #9 & #14

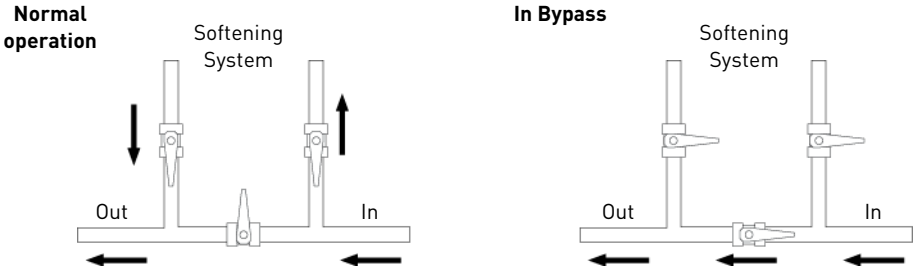


4 controllers NXT
Quadriplex system #5, #6, #9 & #14



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.

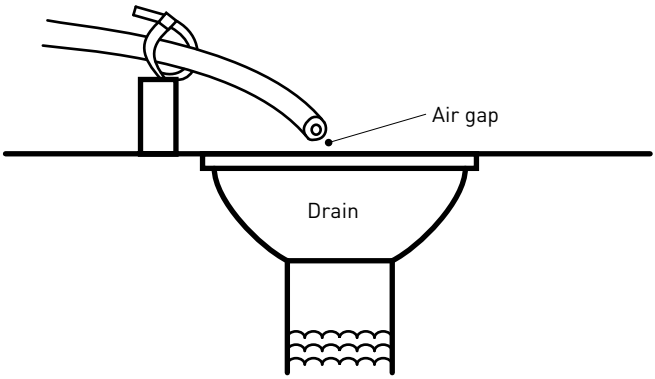
Mandatory
The drain line must be built with 1" PVC rigid tube with an air gap must be present at the drain.

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

The drain line must be built with 2" 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 bars. 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.



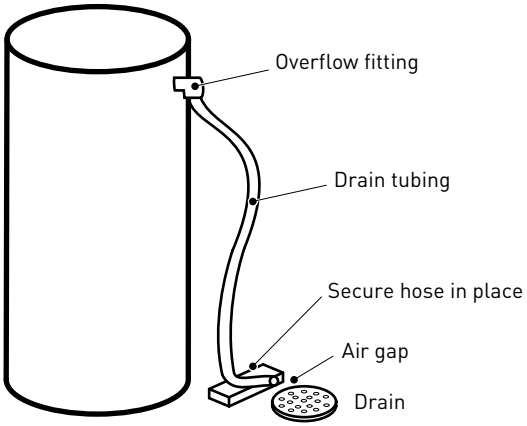
5.12. Overflow line connection

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 built with 1" PVC rigid tube.

Caution
Flexible and semi-flexible hoses may shrink because of the vacuum during brine draw.

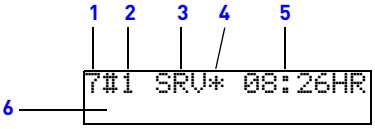
The brine line from the tank connects to the valve. Make the connections and hand tighten. Be sure that the brine line is secure and free from air leaks. Even a small leak may cause the brine line to drain out, and the softener will not draw brine from the tank. This may also introduce air into the valve,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

Most installations utilize a tank check valve.

6. Programming

6.1. Display

6.1.1. During service



1. 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

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

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.

B Select the language to be displayed with ∨ and ∧.

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

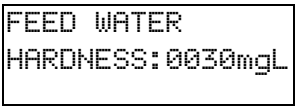
```
SELECT LANGUAGE:
        ENGLISH
```

6.4.2. Inlet water hardness

Set the input water hardness in the unit defined on chapter 6.5.11. Display format, page 58.

D Set the safety coefficient with ▽, △ and ← .

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



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.

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 ← .

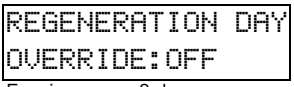
G Press ⊙ to validate the selection and advance to the next parameter.

→ Can be adjusted from:

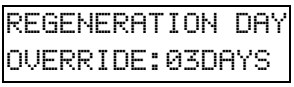
1 to 99 days for timeclock regeneration;

OFF to 99 days for metered regeneration.

Without calendar forcing



Forcing every 3 days



6.4.4. Regeneration start time

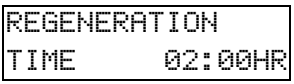
Set the time for regeneration start.

Mandatory
It must be set when the valve is in delayed mode or with a 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



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	2 to 4 units.
	5	Parallel interlock	2 to 4 units.
	6	Parallel series regeneration	2 to 4 units.
	7	Alternating	2 units.
	9	Alternating	2 to 4 units.
	14	Multiple demand valves	2 to 4 units.
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	
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	

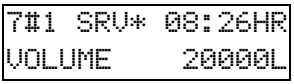
Parameter	Options	Definition	Note
REGEN TYPE	TIME CLK DELAYED	Time clock delayed (default)	System 4 only.
	METER IMMEDIATE	-	All system types.
	MTR DLY FIX RSV	Metered delayed fixed reserve	Systems 4 & 6 only.
VALVE TYPE	2750	-	
	2850	-	
	2900/2910	-	
	3150	-	
	3900	-	
	STAGER-NOTCH CAM	-	
REGENERANT 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	%	Use the SHIFT button to move to the left.
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)	

Parameter	Options	Definition	Note
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	
REGENERATION TIME	00:00:00 to 23:59:59	Hour	Regeneration time will not appear unless regeneration day override is on.
CYCLE 1	OFF to 04:00:00	Hour	
CYCLE 2	OFF to 04:00:00	Hour	
CYCLE 3	OFF to 04:00:00	Hour	
CYCLE 4	OFF to 04:00:00	Hour	
CYCLE 5	OFF to 04:00:00	Hour	This screen will only display when cycle 4 is not OFF.
AUXILIARY RELAY	Enabled	-	
	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	Hour	
CHEMICAL PUMP	Enabled	-	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.
	Disabled	(Default)	

Parameter	Options	Definition	Note
CPO AUX RELAY VOLUME	1 to 9'999	L	
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 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" TURBINE	-	
	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	Only displayed if "Generic" is chosen for the flow meter.

6.5.2. Entering master programming mode

A Press ← and ∧ simultaneously for 5 seconds to enter the master programming mode.



6.5.3. Language setting

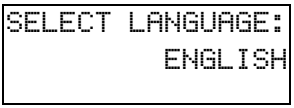
Select the displayed language.

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.



6.5.4. System type

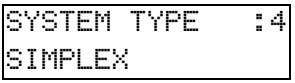
Select the system in which the valve(s) operate(s).

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

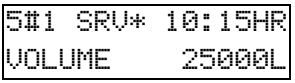
D Set the system type with ∨ and ∧.

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

Example: 4 Single valve



Example: 5 multiple valves



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)

Example: Valve #2

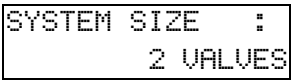
6.5.6. System size

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.

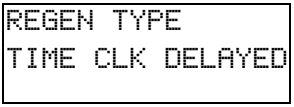
6.5.7. Regeneration type

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.
- 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.
- Volume immediate: Regeneration is requested when the capacity is fully depleted. The regeneration starts immediately.

J Set regeneration type with ∨ and ∧.

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



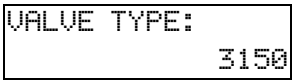
6.5.8. Valve type

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.

•

6.5.9. Regeneration flow

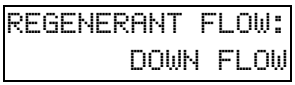
Set the direction of flow during the brine draw cycle.

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

Options:

- Down Flow;
- Up Flow;
- Up Flow Fill First

N Set regeneration flow with ∨ and ∧.
→ Default setting: 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 43).

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

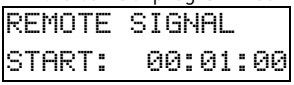
Note
This mode can be combined with the other methods of regeneration; it has priority once it is activated.

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

With remote controller and 1 minute contact programmed



6.5.11. Display format

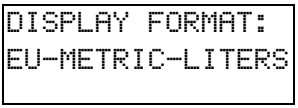
Set the unit system to be used.

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 DE: °dH IT: °TH ES: °TH

R Set the display format with ∨ and ∧.

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



6.5.12. System capacity

Set the system capacity.

Note
The controllers calculate the volume of water that the system can treat between 2 regenerations.

T Set the system 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.

Note
The controller calculates automatically the volume of water treated based on water hardness and system capacity.

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 58.

X Set the safety coefficient 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.

6.5.15.1Trip point 1

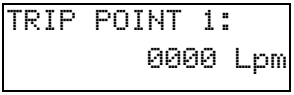
Note
Only visible if controller programmed as valve position #1.

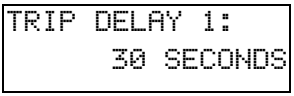
Z Set the trip point 1 flow rate with ∨, ∧ and ← .
→ Can be adjusted from 0 to 3997 Lpm.

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.

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





6.5.15.2Trip point 2

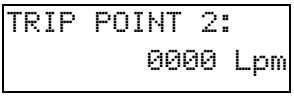
Note
Only visible if controller programmed as valve position #1 and system size to 3 or 4.

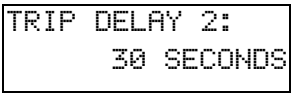
AD Set the trip point 2 flow rate with ∨, ∧ and ← .
→ Can be adjusted from 0 to 3997 Lpm.

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.

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





6.5.15.3Trip point 3

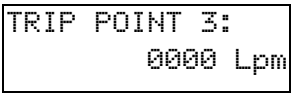
Note
Only visible if controller programmed as valve position #1 and system size to 4.

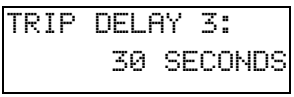
AH Set the trip point 3 flow rate with ∨, ∧ and ← .
→ Can be adjusted from 0 to 3997 Lpm.

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.

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.

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.

AL Adjust the number of days with ▽, △ and ←.

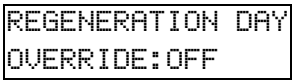
AM Press ⟲ to validate the selection and advance to the next parameter.

→ Can be adjusted from:

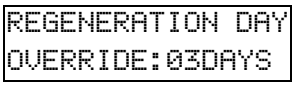
1 to 99 days for timeclock regeneration;

OFF to 99 days for metered regeneration.

Without calendar forcing



Forcing every 3 days



6.5.17. Regeneration start time

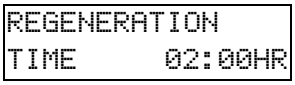
Set the time for regeneration start.

Mandatory
It must be set when the valve is in delayed 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



6.5.18. Programming regeneration cycle times

Set the cycle times of the regeneration.

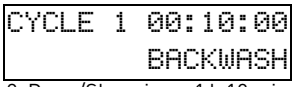
Note
Five cycles can be set. The system displays the programming cycles. The display allows setting of a specific time for each cycle. If a cycle is set to NO, the next cycles is not activated.

AP Adjust the cycle time with ▽, △ and ←.

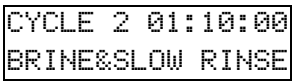
AQ Press ⟲ to validate the selection and advance to the next parameter.

AR Repeat for each cycle.

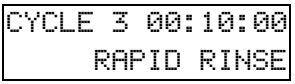
1. Backwash: 10 min



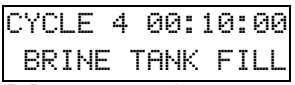
2. Draw/Slow rinse: 1 h 10 min



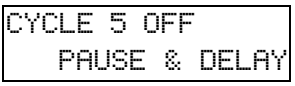
3. Fast rinse: 10 min



4. Refill: 10 min



5. Pause: not used



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.

6.5.19.1Auxiliary relay

Set the relay output during regeneration.

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.

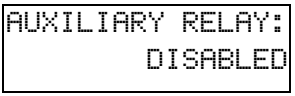
AU Set the relay activation time with ∨, ∧ and ←.

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

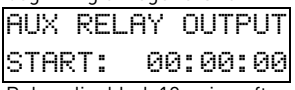
AW Set the relay deactivation time with ∨, ∧ and ←.

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

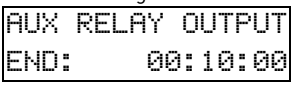
Disabled



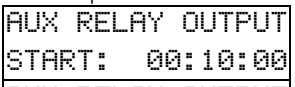
Relay enabled at the beginning of regeneration

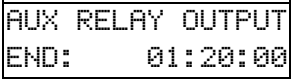


Relay disabled 10 min. after the start of regeneration



Relay enabled during cycle 2 as in chapter 6.5.18.





6.5.19.2Chemical pump

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

Note
Only visible in metered systems.

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

Disabled

```
CHEMICAL PUMP:
        DISABLED
```

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

BA Set the relay activating time with ∨, ∧ and ←.

Relay enabled every 20 litres

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

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

BC Set the relay deactivating time with ∨, ∧ and ←.

Relay enabled for 1 min.

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

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

6.5.20. Flow meter selection

Select the size of the flow meter.

Options:

- 1" paddle;
- 1" turbine;
- 1½" paddle;
- 1½" turbine:
- 2" paddle (std for 3150);
- 3" paddle;
- Generic meter.

BE Select the flow meter with ∨ and ∧.

```
FLOW METER
      2.0"PADDLE
```

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

6.5.20.1Generic meter

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

Set the generic meter.

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

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

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

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

6.6.1. Commands

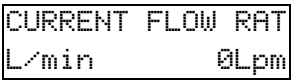
A Press D to enter the Diagnostic mode.

B Press to pass at the next step.

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

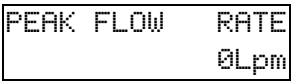
6.6.2. Current flow rate

Note
The display is updated every second.



6.6.3. Peak flow rate

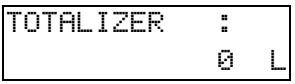
Note
The controller registers the highest flow rate since the last regeneration.



6.6.4. Totalizer

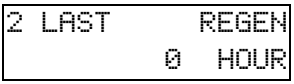
Note
The controller registers the total volume of treated water that passes through the meter since start-up (or last hard reset).

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



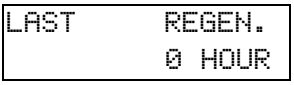
6.6.5. Hours between last two regenerations

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



6.6.6. Hours since last regeneration

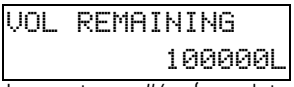
Note
Shows the number of hours since the last regeneration, indicating the duration of the current service cycle.



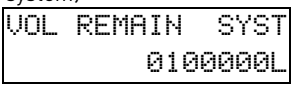
6.6.7. Volume remaining

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



In system #6 (complete system)



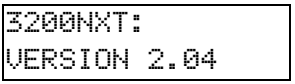
6.6.8. Valve position

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

6.6.9. Software version

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.



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.

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

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 (unless non-standard regen sequence is programmed). 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.

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.

7.1.3. Additional tips

You can start programming from the beginning by resetting the amount of media, see chapter 6.7. Resetting the controller, page 67.

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 odour 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

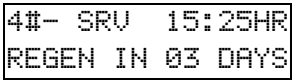
Valves or systems already equipped with an electrochlorinator device or system will be sanitized during the brine draw phase.

8. Operation

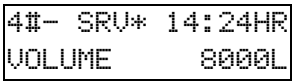
8.1. Display

8.1.1. During service

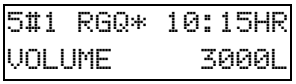
- Single valve in service in timeclock mode:



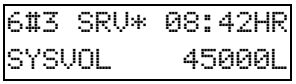
- Single valve in service in volume immediate or delayed mode:



- Lead valve in regeneration queued in interlock system:



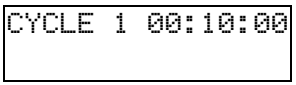
- Valve 3 in service in serial regeneration system:



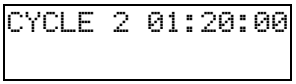
8.1.2. During regeneration

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.

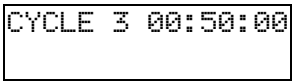
- Cycle 1, time remaining 10 min:



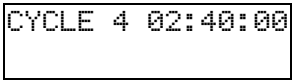
- Cycle 2, time remaining 1 hour 20 min:



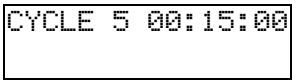
- Cycle 3, time remaining 50 min:



- Cycle 4, time remaining 2 hours 40 min:



- Cycle 5, time remaining 15 min:



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 61.
→ 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 for 5 minutes when there has been a power failure.
- The flashing of the time of day can be stopped by pressing any button on the display.

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.

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

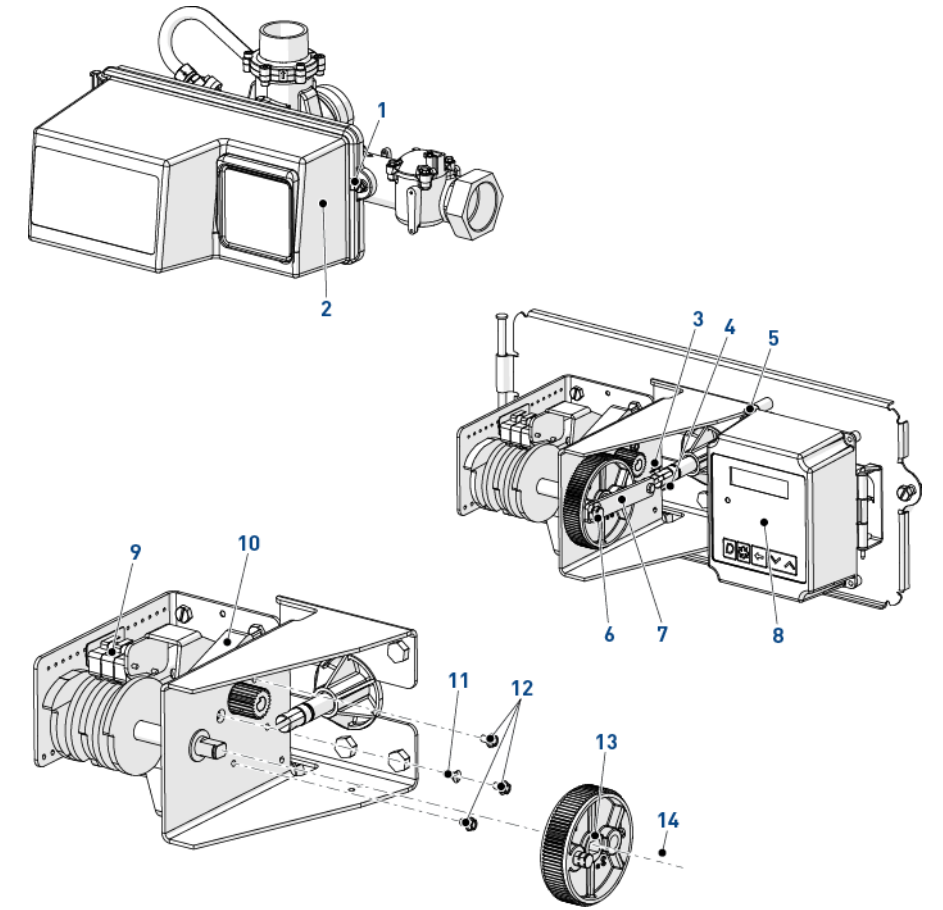
9.2.1. Cleaning and maintenance

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.

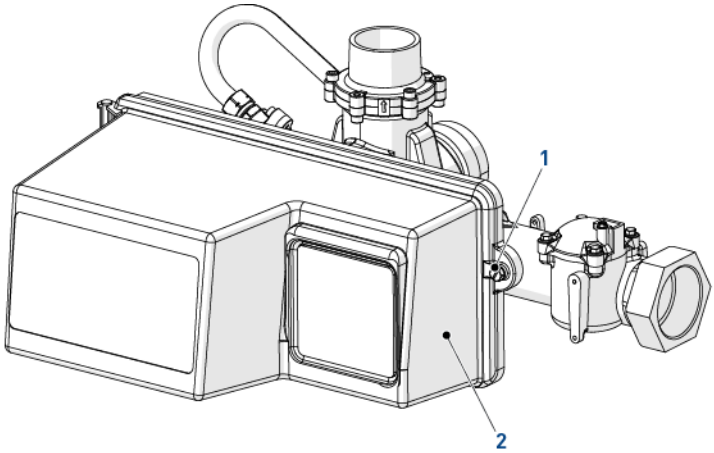
9.2.2. Replacing the motor

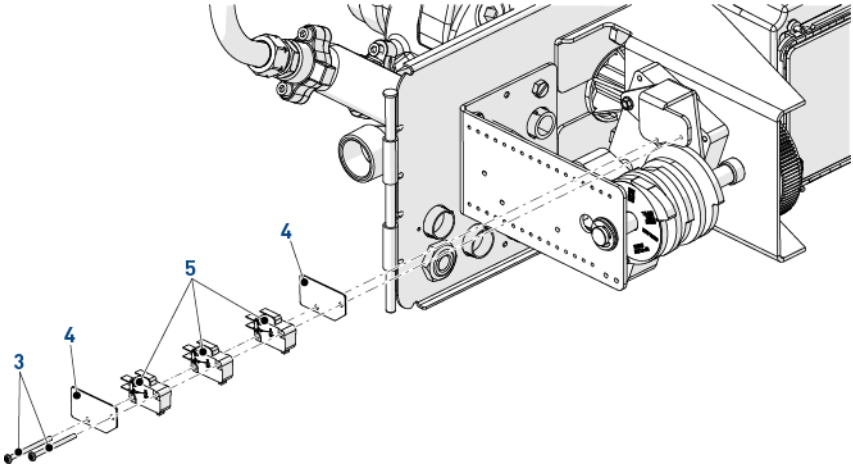
No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Disconnect the motor (**10**).
C	Remove the micro-switches (**9**), see 9.2.3. Replacing the micro-switches, page 75.
D	Using a Philips screwdriver, unscrew (**5**) and open the controller (**8**).
E	Using a pliers, remove the connecting pin (**3**) and the circlip (**6**).
F	Remove the pin (**4**) and the plate (**7**).
G	Using a pliers, remove the circlip (**14**) and the wheel (**13**).
H	Using a flat screwdriver unscrew (**12**).
I	Using a wrench, unscrew (**11**) and remove the motor (**10**).
J	Reverse above procedure steps to rebuild



9.2.3. Replacing the micro-switches

No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Using a Phillips screwdriver, unscrew (**3**) and extract the protection plates (**4**) and the micro-switches (**5**).
C	Reverse above procedure steps to rebuild



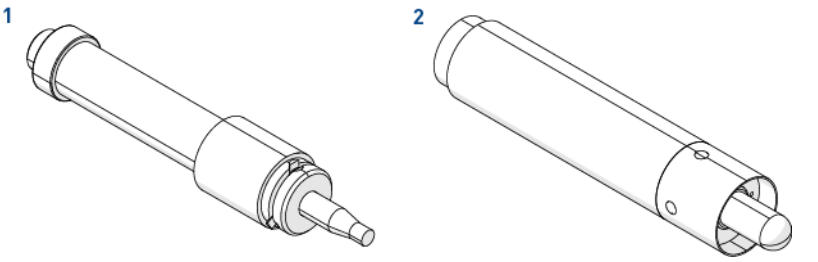


9.2.4. Replacing the piston and/or seal and spacer kit

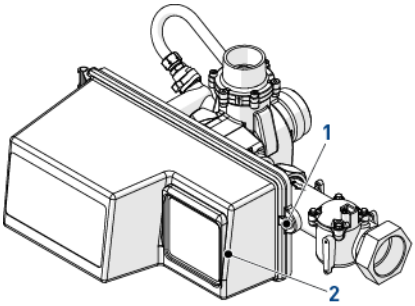
No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Using a 4 mm Allen wrench, unscrew (**3**).
C	Using pliers, remove the clip (**7**) and the connecting pin (**8**).
D	Using a 10 mm wrench, unscrew (**4**) and remove the power head (**5**) and the o-ring (**6**).
E	Using pliers, remove the piston (**11**).
F	Using a small hook, remove a seal (**13**).
G	Using the puller, remove a spacer (**9** or **10**).
H	Repeat **G** and **H** for all the seals and spacers.
I	Lubricate each new seals (**13**).
J	Put back a seal (**13**) using the stuffer.
K	Put back a spacer (**9** or **10**) using the stuffer.
	Mandatory Respect the order of the spacers shown on the sketch.
L	Repeat **I** and **K** for all the seals and spacers.
M	Lubricate the piston o-ring (**12**).
N	Put back the piston (**11**).
O	Follow **A** to **D** in reverse order to rebuild.

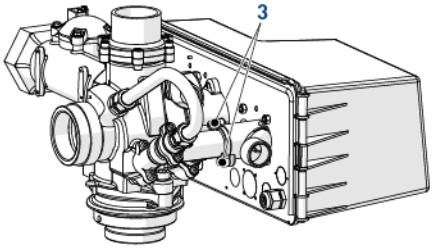
Caution
Use only approved silicon grease or soapy water.

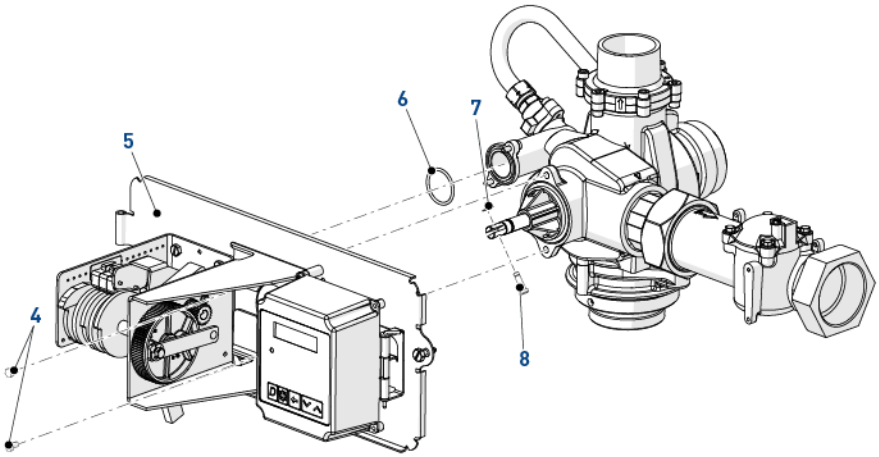
9.2.4.1 Special tools needed

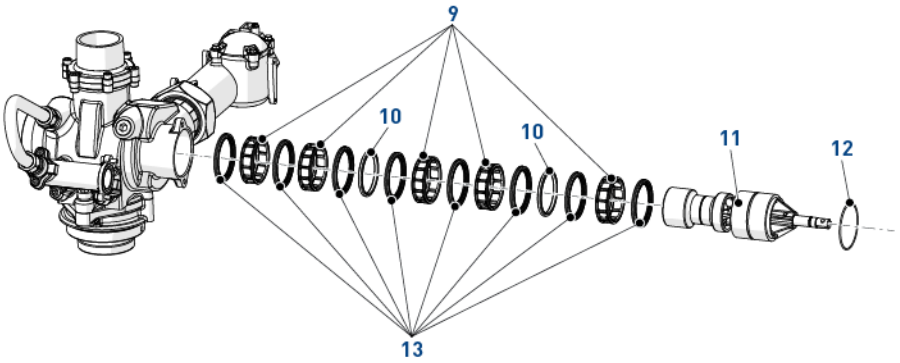


Item	Part number	Description	Packaging quantity
1	13061	Puller	1
2	11098	Stuffer	1


1
2

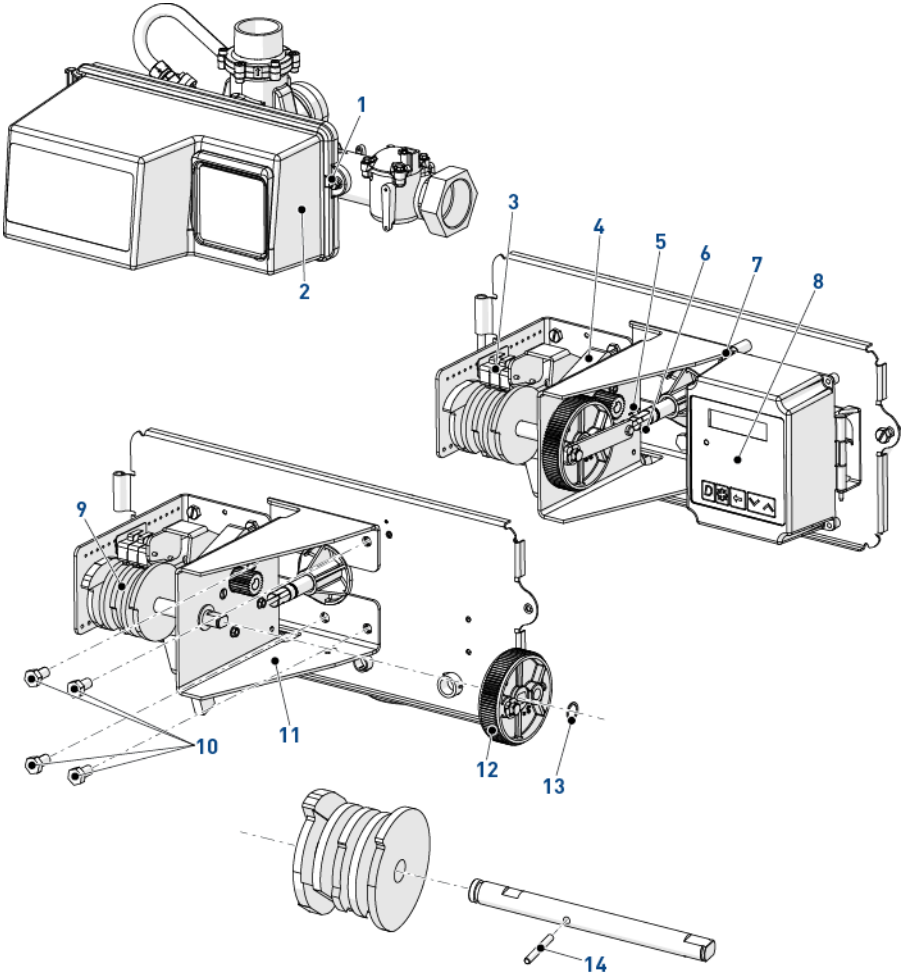

3


4
5
6
7
8


9
10
10
11
12
13

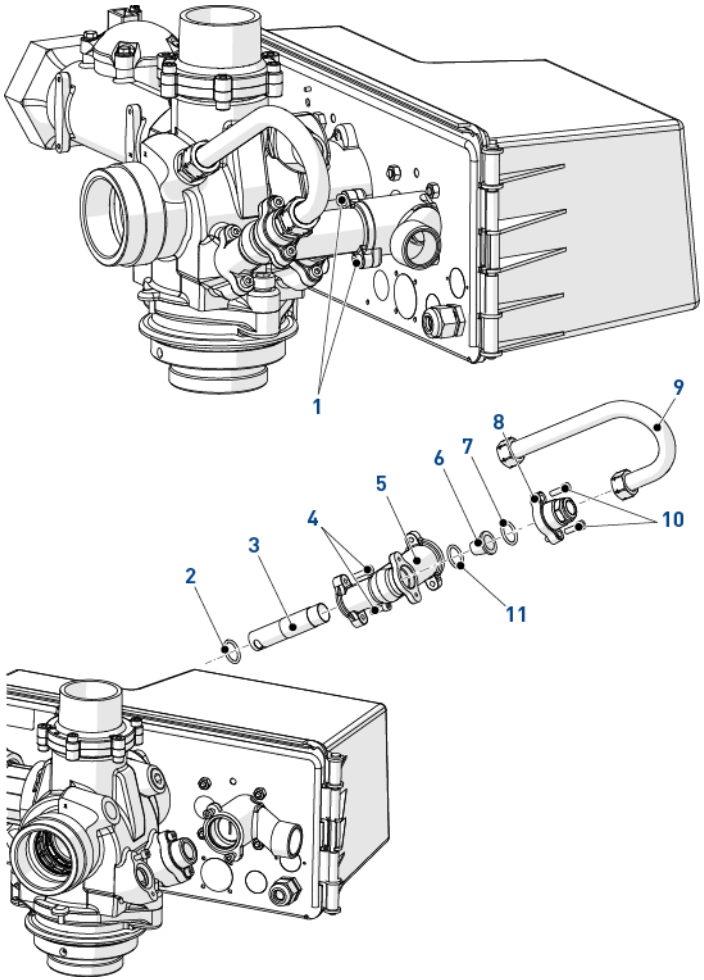
9.2.5. Replacing the cams

No.	Operation
A	Using a flat screwdriver, unscrew (**1**) and open the cover (**2**).
B	Remove the micro-switches (**3**), see 9.2.3. Replacing the micro-switches, page 75.
C	Disconnect the motor (**4**).
D	Using a Philips screwdriver, unscrew (**7**) and open the controller (**8**).
E	Using pliers, remove the clip (**5**) and the connecting pin (**6**).
F	Using pliers, remove the circlip (**13**) and the wheel (**12**).
G	Using a 10 mm wrench, unscrew (**10**) and remove the plate (**11**) and the camshaft (**9**).
H	Using a pin punch, remove the pin (**14**).
I	Reverse above procedure steps to rebuild



9.2.6. Cleaning the injector and the BLFC

No.	Operation
A	Using a 4 mm Allen wrench, unscrew (**1**).
B	Using a 24 mm wrench, remove the tube (**9**).
C	Using a 4 mm Allen wrench, unscrew (**10**) and remove the connector (**8**), the o-ring (**7**) and the BLFC (**6**).
D	Using a 4 mm Allen wrench, unscrew (**4**) and remove the T-tube (**5**), the o-rings (**2** and **11**) and the injector (**3**).
E	Clean the injector (**3**) and the BLFC (**6**) using compressed air, a soft brush or possibly a pin.
F	Lubricate on the o-rings (**2**), (**7**) and (**11**) using silicon grease.
G	Reverse above procedure steps to rebuild



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.
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.

Problem	Cause	Solution
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.
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.

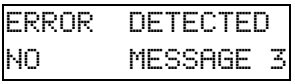
Cause	Solution
More than one unit programmed with the same position number.	Program correctly the units using only once per position number.
Flashing display.	There was a power failure.
Units of measure do not correspond: units have different units of measure programmed.	Check and program all units in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

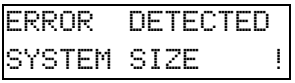
- The unit 2 has been reset.
  → Reprogram the unit.

- 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.



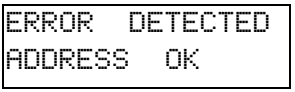
- There are more units in the system than programmed in the lead (#1) unit.



- The programmed values do not match, check the values programmed in each unit.

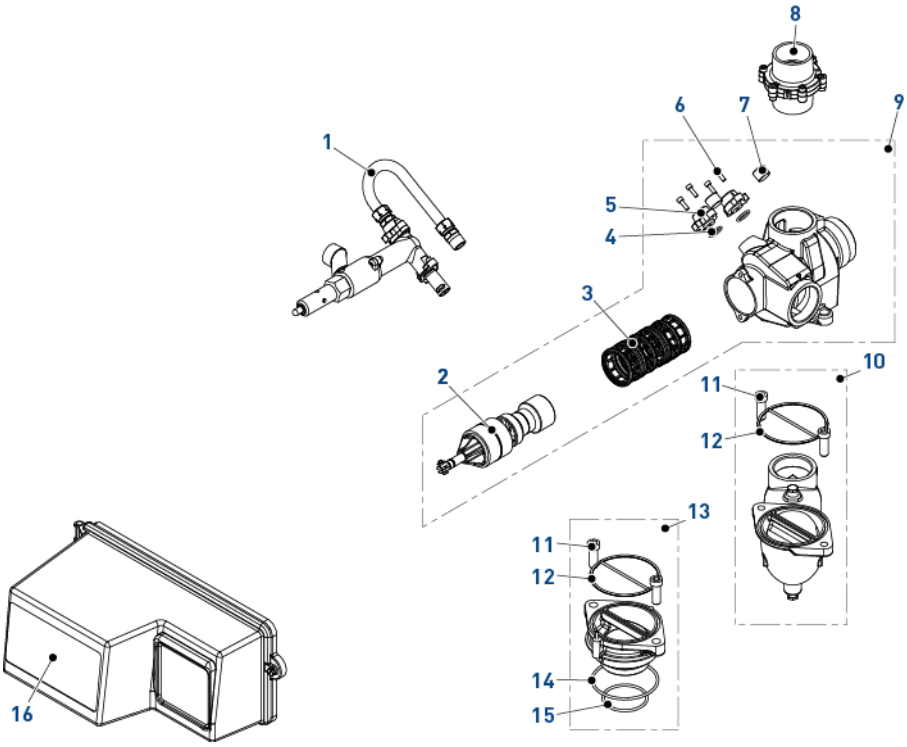
  → Example: Display format different from one unit to the other.
  → Example: System of 4 units, but only 2 detected or connected.

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



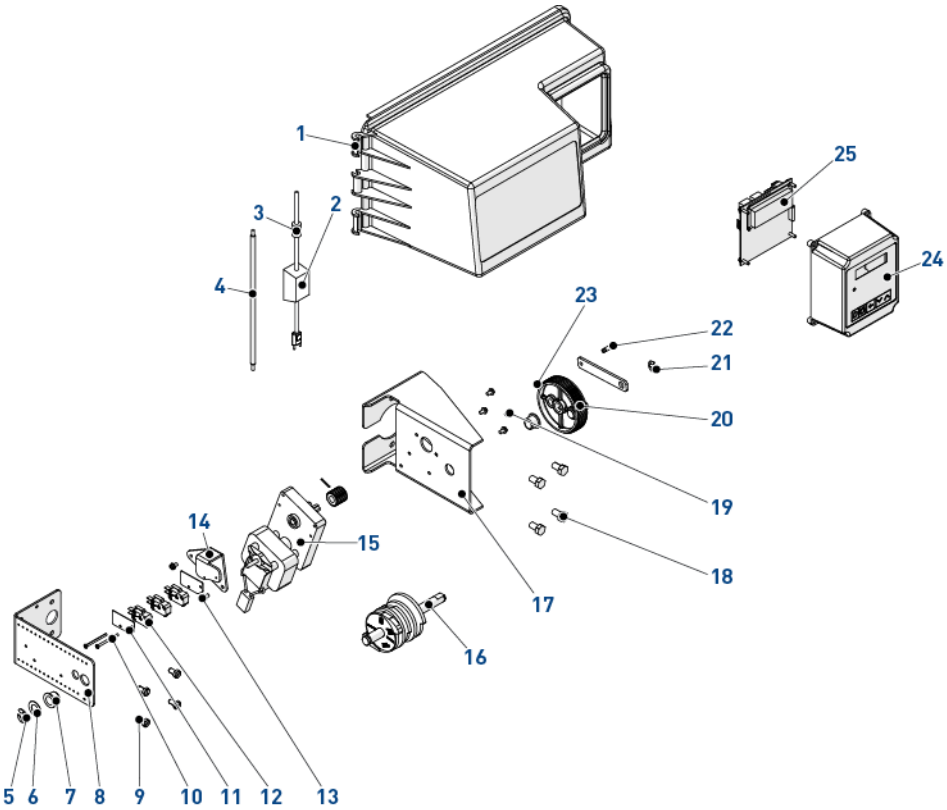
11. Spare parts and options

11.1. Valve parts list



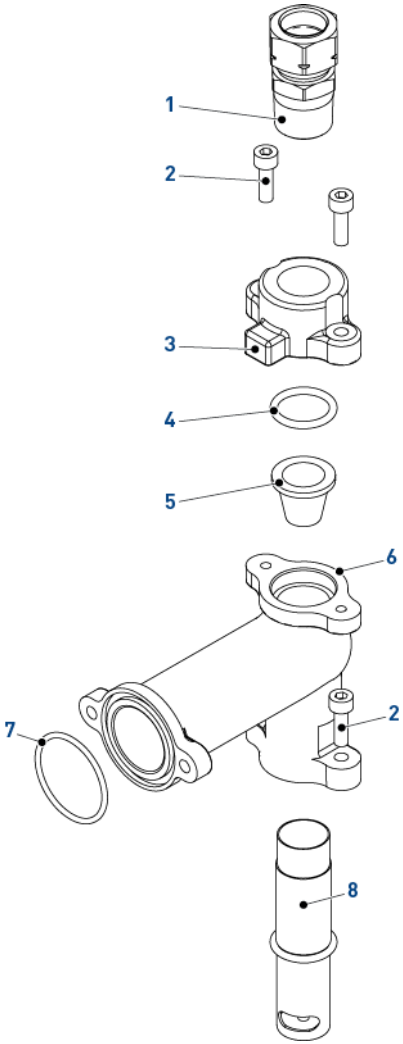
Item	Part number	Description	Packaging quantity
1	26745-4	Brine valve 1800 assembly 3900 down flow	1
-	26745-5	Brine valve 1800 assembly 3900 down flow	1
-	26745-6	Brine valve 1800 assembly 3900 down flow	1
-	26745-7	Brine valve 1800 assembly 3900 down flow	1
-	26745-8	Brine valve 1800 assembly 3900 down flow	1
-	26745-9	Brine valve 1800 assembly 3900 down flow	1
-	26745-10	Brine valve 1800 assembly 3900 down flow	1
2	60106-00	Piston assembly 3150 upper down flow	1
-	60106-10	Piston assembly 3150 up flow	1
3	18022	Seals & Spacers kit 3150 upper	1
4	15246-01	O-ring 560 CD	10
5	16341-02	Injector plug 1800	1
6	19677	Screw	10
7	16387	Valve body plug ½" NPT 3150/3900	1
8	25580-ALL	DLFC kit 2" 3150 30 to 100 gpm	1
9	BU28516-01	Valve body assembly 3150 WBP	1
-	BU28516-02	Valve body assembly 3150 NBP	1
-	BU28516-03	Valve body assembly 3150 up flow	1
10	18023	Tank adapter assembly 3150 SM	1
11	25165	Screw THM 12x35	10
12	15112	Seal 3150 adapter base	1
13	18024	Tank adapter assembly 3150 TM	1
14	13575-01	O-ring 560 CD top of tank	5
15	25823	O-ring 63mm 3150 TM	1
16	PH3150-001	Power head 3150 24V / 50Hz grey without timer	1
-	PH3150-002	Power head 3150 NXT 24V / 50Hz	1

11.2. Power head 3150 parts list



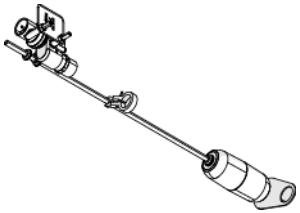
Item	Part number	Description	Packaging quantity
1	26637	Cover assembly 3150 upper grey	1
2	26260	Transformer 60VA	1
3	17967	Liquid tight	1
4	25352	Guide cable & cable assembly 3150 2"	1
5	16051	Retaining ring	10
6	16059	Washer	10
7	BR16052	Bushing	10
8	16053	Bracket brine side	1
9	23728	Screw THM 6x12	8
10	BR40080	Screw microswitch	10
11	10302	Insulator limit switch	10
12	10218	Microswitch	5
13	10872	Screw motor mounting	10
14	17797	Bracket switch mounting	1
15	28409-01	Drive motor assembly 3150 24V	1
16	16494-04	Cam assembly 3150 upper up flow grey	1
-	16494-05	Cam assembly 3150 upper up flow black	1
17	15120-01	Bracket motor 3150	1
18	21361	Screw TCHCM 8x16	10
19	11080	Screw flat head	10
20	18963-31	Drive gear 3150 adapter	1
21	BR16050	Retaining ring	10
22	11709	Pin link 3150	1
23	11898	Clip 3150	10
24	BU28713	Timer assembly NXT 3200	1
25	BR61702-03	Circuit board NXT	1

11.3. Injector parts list



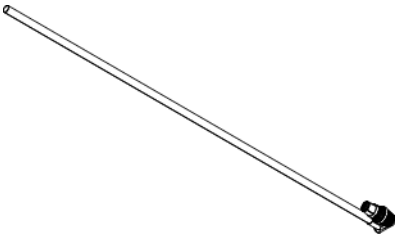
Item	Part number	Description	Packaging quantity
1	18702	Fitting, tube 1/2 NPT 5/8	1
2	19677	SCH CAP, screw M5 X 16	10
3	16341-01	1/2-14 NPT Tap injector cover 3150	1
4	15246	O-ring - 116 EP	1
5	15128-04	Injector nozzle # 4	1
-	15128-05	Injector nozzle # 5	1
-	15128-06	Injector nozzle # 6	1
-	15128-07	Injector nozzle # 7	1
-	15128-08	Injector nozzle # 8	1
-	15128-09	Injector nozzle # 9	1
-	15128-10	Injector nozzle # 10	1
6	16340-20	Injector body DF	1
-	16340-21	Injector body UF	1
7	19054	O-ring - 124	1
8	15127-04	Injector throat #4	1
-	15127-05	Injector throat #5	1
-	15127-06	Injector throat #6	1
-	15127-07	Injector throat #7	1
-	15127-08	Injector throat #8	1
-	15127-09	Injector throat #9	1
-	15127-10	Injector throat #10	1

11.4. Safety brine valves list



Item	Part number	Description	Packaging quantity
-	28182	Union PVC Female 1" to be glued - Male 1" BSP	5

11.5. Air checks list

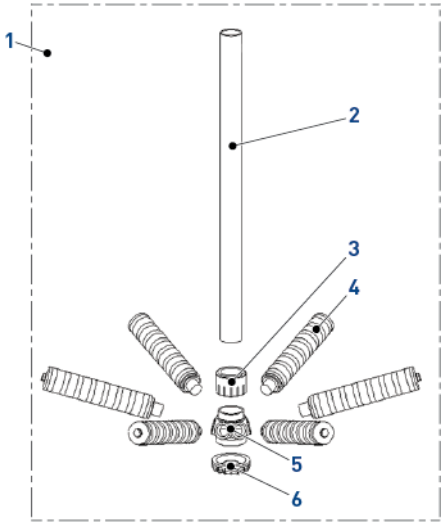


Item	Part number	Description	Packaging quantity
-	18979	Air Check 900 - 1m88	5
-	BU28510	Air Check 900 - 1m10	5
-	18980	Air Check 900 Hot Water	5

11.6. Distribution systems parts list

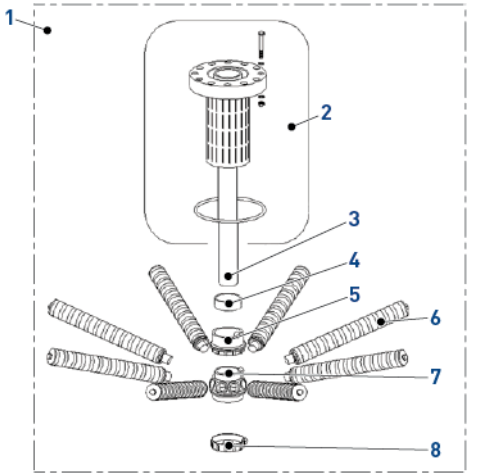
Caution
Respect the valve sizing configuration to avoid the resin to leak through the valve.

11.6.1. Thread 4", tank 21" to 36", top mounted valve, slots0.2 mm



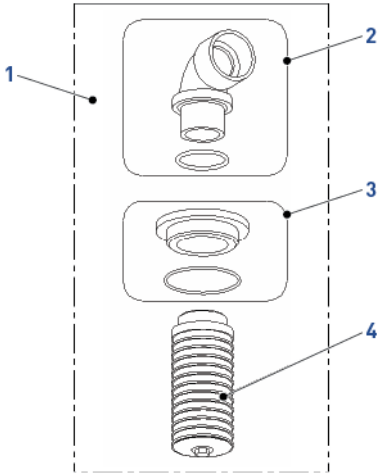
Item	Part number	Description	Packaging quantity
1	A-2163-TM	Distribution system assembly, tanks 21" - 24"	1
-	A-3063-TM	Distribution system assembly, tank 30"	1
-	A-3663-TM	Distribution system assembly, tank 36"	1
2	A-PVC-063	Riser tube	1
3	A-1074-1	Reducing bush	1
4	A-TH02-113	Lateral 113 mm, tanks 14" - 18"	6
-	A-TH02-175	Lateral 175 mm, tanks 21" - 24"	6
-	A-TH02-268	Lateral 268 mm, tank 30"	6
-	A-TH02-330	Lateral 330 mm, tank 36"	6
5	ATD-H60-00	Hub	1
6	AC-H60-00	Hub cap	1

11.6.2. Flanged 6", tank 21" to 36", top mounted valve, slots 0.2 mm



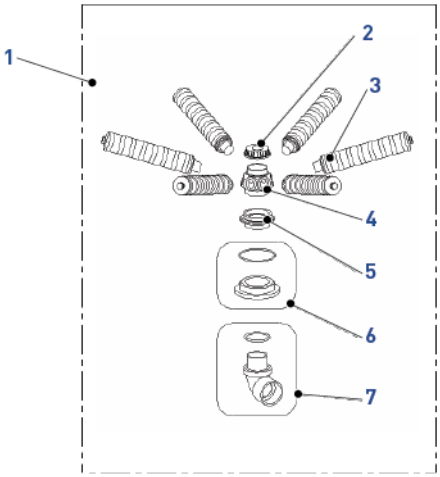
Item	Part number	Description	Packaging quantity
1	A-TF21-063	Distribution system assembly, tanks 21" - 24"	1
-	A-TF30-063	Distribution system assembly, tank 30"	1
-	A-TF36-063	Distribution system assembly, tank 36"	1
-	A-TF42-063	Distribution system assembly, tank 42"	1
2	A-3100-14C	Adapter	1
3	A-PVC-063	Riser tube	1
4	A-3050-91	Reducing bush	1
5	AB-GC8-30	Reducing bush	1
6	A-TH02-175	Lateral 175 mm, tanks 21" - 24"	1
-	A-TH02-268	Lateral 268 mm, tank 30"	1
-	A-TH02-330	Lateral 330 mm, tank 36"	1
-	A-TH02-361	Lateral 361 mm, tank 42"	1
7	ATD-H80-00	Hub	1
8	AD-H80-00	Hub cap	1

11.6.3. Threaded 4", tank 21" to 36", side mounted valve, top distribution system, elbow 63 mm, external glue connection



Item	Part number	Description	Packaging quantity
1	A-2727-63	Top distribution system assembly, slots 0.2 mm	1
-	A-2727-65	Top distribution system assembly, slots 0.5 mm	1
2	A-2693-C	Elbow	1
3	A-2752-11C	Adaptor	1
4	A-2740	Diffuser, slots 0.2 mm	1
-	A-2746	Diffuser, slots 0.5 mm	1

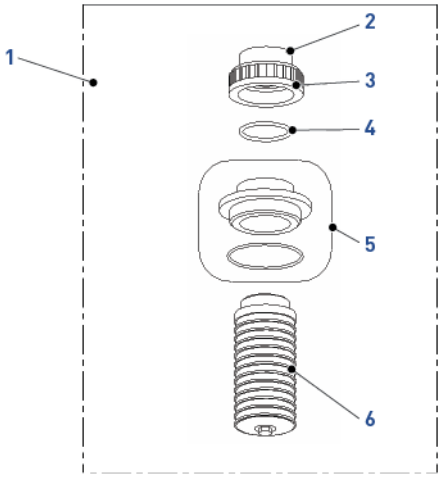
11.6.4. Threaded 4", tank 21" to 36", side mounted valve, bottom distribution system, elbow 63 mm, external glue connection



Item	Part number	Description	Packaging quantity
1	A-2821-63	Bottom distribution system assembly, tanks 21" - 24", slots 0.2 mm	1
-	A-2821-65	Bottom distribution system assembly, tanks 21" - 24", slots 0.5 mm	1
-	A-2830-63	Bottom distribution system assembly, tank 30", slots 0.2 mm	1
-	A-2830-65	Bottom distribution system assembly, tank 30", slots 0.5 mm	1
-	A-2836-63	Bottom distribution system assembly, tank 36", slots 0.2 mm	1
-	A-2836-65	Bottom distribution system assembly, tank 36", slots 0.5 mm	1
2	AD-H60-00	Hub cap	1
3	A-TH02-175	Lateral 175 mm, tanks 21" - 24", slots 0.2 mm	6
-	A-TH05-175	Lateral 175 mm, tanks 21" - 24", slots 0.5 mm	6
-	A-TH02-268	Lateral 268 mm, tank 30", slots 0.2 mm	6
-	A-TH05-268	Lateral 268 mm, tank 30", slots 0.5 mm	6
-	A-TH02-330	Lateral 330 mm, tank 36", slots 0.2 mm	6
-	A-TH05-330	Lateral 330 mm, tank 36", slots 0.5 mm	6

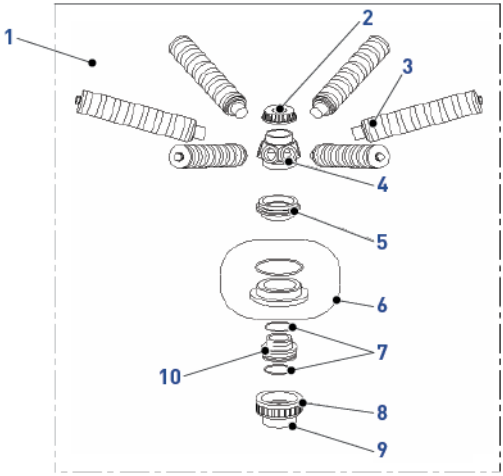
Item	Part number	Description	Packaging quantity
4	ATD-H60-00	Hub	1
5	AB-A6F-20	Hub adaptor	1
6	A-2106-48	Adaptor	1
7	A-2693-C	Elbow	1

11.6.5. Threaded 4", tank 21" to 36", side mounted valve, top distribution system, straight 63 mm, external glue connection



Item	Part number	Description	Packaging quantity
1	A-27UN-63	Top distribution system assembly, slots 0.2 mm	1
-	A-27UN-65	Top distribution system assembly, slots 0.5 mm	1
2	A-8200-63	Union nut	1
3	A-8250-63	Collar	1
4	A-2694-17	O-ring	1
5	A-2752-32	Adapter	1
6	A-2740	Diffuser, slots 0.2 mm	1
-	A-2746	Diffuser, slots 0.5 mm	1

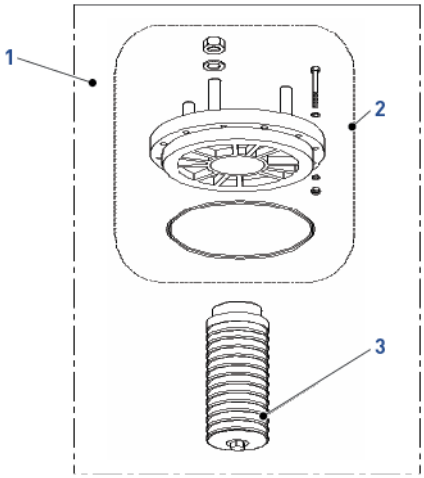
11.6.6. Threaded 4", tank 21" to 36", side mounted valve, bottom distribution system, straight 63 mm, external glue connection



Item	Part number	Description	Packaging quantity
1	A-21UN-63	Bottom distribution system assembly, tanks 21" - 24", slots 0.2 mm	1
-	A-21UN-65	Bottom distribution system assembly, tanks 21" - 24", slots 0.5 mm	1
-	A-30UN-63	Bottom distribution system assembly, tank 30", slots 0.2 mm	1
-	A-30UN-65	Bottom distribution system assembly, tank 30", slots 0.5 mm	1
-	A-36UN-63	Bottom distribution system assembly, tank 36", slots 0.2 mm	1
-	A-36UN-65	Bottom distribution system assembly, tank 36", slots 0.5 mm	1
2	AD-H60-00	Hub cap	1
3	A-TH02-175	Lateral 175 mm, tanks 21" - 24", slots 0.2 mm	6
-	A-TH05-175	Lateral 175 mm, tanks 21" - 24", slots 0.5 mm	6
-	A-TH02-268	Lateral 268 mm, tank 30", slots 0.2 mm	6
-	A-TH05-268	Lateral 268 mm, tank 30", slots 0.5 mm	6
-	A-TH02-330	Lateral 330 mm, tank 36", slots 0.2 mm	6
-	A-TH05-330	Lateral 330 mm, tank 36", slots 0.5 mm	6

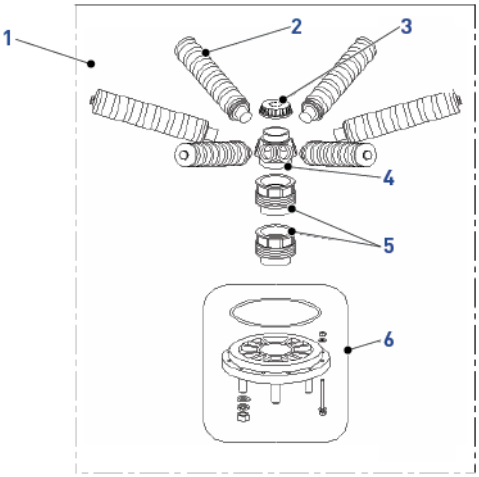
Item	Part number	Description	Packaging quantity
4	ATD-H60-00	Hub	1
5	AB-A6F-20	Hub adaptor	1
6	A-2106-48	Adaptor	1
7	A-2694-17	O-ring	2
8	A-8200-63	Union nut	1
9	A-8250-63	Collar	1
10	A-2700-234	Adaptor	1

11.6.7. Flanged 6", tank 21" to 36", side mounted valve, top distribution system, external flange 65 mm connection



Item	Part number	Description	Packaging quantity
1	A-2727-F6	Top distribution system assembly, slots 0.2 mm	1
-	A-2527-F6	Top distribution system assembly, slots 0.5 mm	1
2	A-3100-02C	Adaptor	1
3	A-2740	Diffuser, slots 0.2 mm	1
-	A-2746	Diffuser, slots 0.5 mm	1

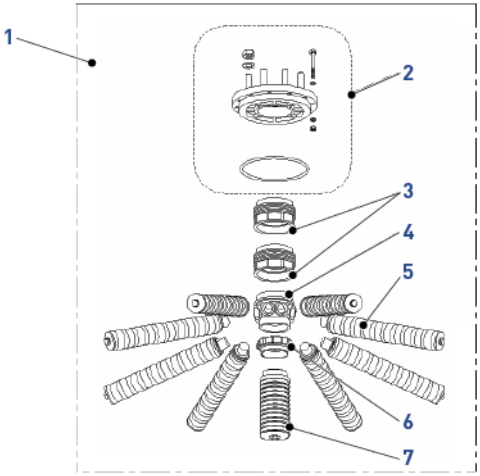
11.6.8. Flanged 6", tank 21" to 36", side mounted valve, bottom distribution system, external flange 65 mm connection



Item	Part number	Description	Packaging quantity
1	A-2721-F6	Bottom distribution system assembly, tanks 21" - 24", slots 0.2 mm	1
-	A-2521-F6	Bottom distribution system assembly, tanks 21" - 24", slots 0.5 mm	1
-	A-2730-F6	Bottom distribution system assembly, tank 30", slots 0.2 mm	1
-	A-2530-F6	Bottom distribution system assembly, tank 30", slots 0.5 mm	1
-	A-2736-F6	Bottom distribution system assembly, tank 36", slots 0.2 mm	1
-	A-2536-F6	Bottom distribution system assembly, tank 36", slots 0.5 mm	1
2	A-TH02-175	Lateral 175 mm, tanks 21" - 24", slots 0.2 mm	6
-	A-TH05-175	Lateral 175 mm, tanks 21" - 24", slots 0.5 mm	6
-	A-TH02-268	Lateral 268 mm, tank 30", slots 0.2 mm	6
-	A-TH05-268	Lateral 268 mm, tank 30", slots 0.5 mm	6
-	A-TH02-330	Lateral 330 mm, tank 36", slots 0.2 mm	6
-	A-TH05-330	Lateral 330 mm, tank 36", slots 0.5 mm	6

Item	Part number	Description	Packaging quantity
3	AD-H60-00	Hub cap	1
4	ATD-H60-00	Hub	1
5	A-3100-04C	Prolongation	2
6	A-3100-02C	Adaptor	1

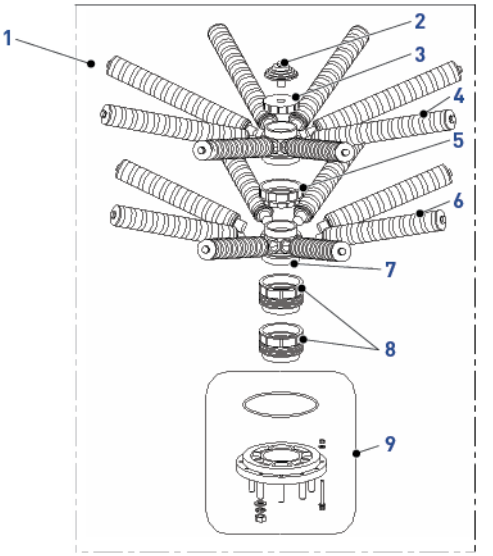
11.6.9. Flanged 6", tank 42" to 63", side mounted valve, top distribution system, external flange 80 mm connection



Item	Part number	Description	Packaging quantity
1	A-2742-FU	Bottom distribution system assembly, tank 42", slots 0.2 mm	1
-	A-2542-FU	Bottom distribution system assembly, tank 42", slots 0.5 mm	1
-	A-2748-FU	Bottom distribution system assembly, tank 48", slots 0.2 mm	1
-	A-2548-FU	Bottom distribution system assembly, tank 48", slots 0.5 mm	1
-	A-2755-FU	Bottom distribution system assembly, tank 55", slots 0.2 mm	1
-	A-2555-FU	Bottom distribution system assembly, tank 55", slots 0.5 mm	1
-	A-2763-FU	Bottom distribution system assembly, tank 63", slots 0.2 mm	1
-	A-2563-FU	Bottom distribution system assembly, tank 63", slots 0.5 mm	1
2	A-3100-03C	Adaptor	1
3	A-3100-05C	Prolongation	2
4	ATD-H80-00	Hub	1
5	A-TH02-361	Lateral 361 mm, tank 42", slots 0.2 mm	8

Item	Part number	Description	Packaging quantity
-	A-TH05-361	Lateral 361 mm, tank 42", slots 0.5 mm	8
-	A-TH02-423	Lateral 423 mm, tank 48", slots 0.2 mm	8
-	A-TH05-423	Lateral 423 mm, tank 48", slots 0.5 mm	8
-	A-TH02-516	Lateral 516 mm, tank 55", slots 0.2 mm	8
-	A-TH05-516	Lateral 516 mm, tank 55", slots 0.5 mm	8
-	A-TH02-578	Lateral 578 mm, tank 63", slots 0.2 mm	8
-	A-TH05-578	Lateral 578 mm, tank 63", slots 0.5 mm	8
6	AB-C08-30	Connection	1
7	A-2740	Diffuser, slots 0.2 mm	1
-	A-2746	Diffuser, slots 0.5 mm	1

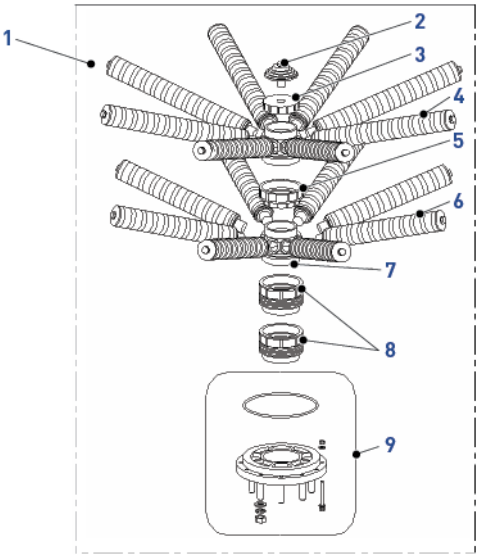
11.6.10. Flanged 6", tank 42" to 63", side mounted valve, bottom distribution system, external flange 80 mm connection



Item	Part number	Description	Packaging quantity
1	A-2742-FL	Bottom distribution system assembly, tank 42", slots 0.2 mm	1
-	A-2542-FL	Bottom distribution system assembly, tank 42", slots 0.5 mm	1
-	A-2748-FL	Bottom distribution system assembly, tank 48", slots 0.2 mm	1
-	A-2548-FL	Bottom distribution system assembly, tank 48", slots 0.5 mm	1
-	A-2755-FL	Bottom distribution system assembly, tank 55", slots 0.2 mm	1
-	A-2555-FL	Bottom distribution system assembly, tank 55", slots 0.5 mm	1
-	A-2763-FL	Bottom distribution system assembly, tank 63", slots 0.2 mm	1
-	A-2563-FL	Bottom distribution system assembly, tank 63", slots 0.5 mm	1
2	A-2727-10	Filter nozzle	1
3	A-BTC8-30	Hub cap	1

Item	Part number	Description	Packaging quantity
4	A-TH02-423	Lateral 423 mm, tank 42", slots 0.2 mm	8
-	A-TH05-423	Lateral 423 mm, tank 42", slots 0.5 mm	8
-	A-TH02-485	Lateral 485 mm, tank 48", slots 0.2 mm	8
-	A-TH05-485	Lateral 485 mm, tank 48", slots 0.5 mm	8
-	A-TH02-578	Lateral 578 mm, tank 55", slots 0.2 mm	8
-	A-TH05-578	Lateral 578 mm, tank 55", slots 0.5 mm	8
-	A-TH02-640	Lateral 640 mm, tank 63", slots 0.2 mm	8
-	A-TH05-640	Lateral 640 mm, tank 63", slots 0.5 mm	8
5	AB-C08-40	Connection	1
6	A-TH02-361	Lateral 361 mm, tank 42", slots 0.2 mm	8
-	A-TH05-361	Lateral 361 mm, tank 42", slots 0.5 mm	8
-	A-TH02-423	Lateral 423 mm, tank 48", slots 0.2 mm	8
-	A-TH05-423	Lateral 423 mm, tank 48", slots 0.5 mm	8
-	A-TH02-516	Lateral 516 mm, tank 55", slots 0.2 mm	8
-	A-TH05-516	Lateral 516 mm, tank 55", slots 0.5 mm	8
-	A-TH02-578	Lateral 578 mm, tank 63", slots 0.2 mm	8
-	A-TH05-578	Lateral 578 mm, tank 63", slots 0.5 mm	8
7	ATD-H80-00	Hub	2
8	A-3100-05C	Prolongation	2
9	A-3100-03C	Adaptor	1

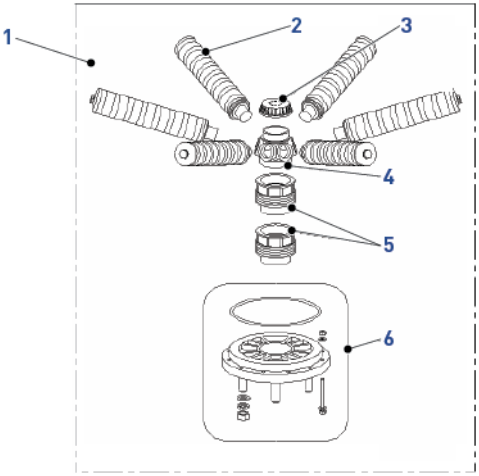
11.6.11. Hot water, flanged 6", tank 42" to 63", side mounted valve, top and bottom distribution system, external flange 80 mm connection, slots 0.2 mm



Item	Part number	Description	Packaging quantity
1	A3-2742-FL	Bottom distribution system assembly, tank 42"	1
-	A3-2748-FL	Bottom distribution system assembly, tank 48"	1
-	A3-2755-FL	Bottom distribution system assembly, tank 55"	1
-	A3-2763-FL	Bottom distribution system assembly, tank 63"	1
2	A3-2727-10	Filter nozzle	1
3	A3-BTC8-30	Hub cap	1
4	A3-TH02-423	Upper lateral 423 mm, tank 42"	8
-	A3-TH02-485	Upper lateral 485 mm, tank 48"	8
-	A3-TH02-578	Upper lateral 578 mm, tank 55"	8
-	A3-TH02-640	Upper lateral 640 mm, tank 63"	8
5	AB3-C08-40	Connection	1
6	A3-TH02-361	Lower lateral 361 mm, tank 42"	8
-	A3-TH02-423	Lower lateral 423 mm, tank 48"	8

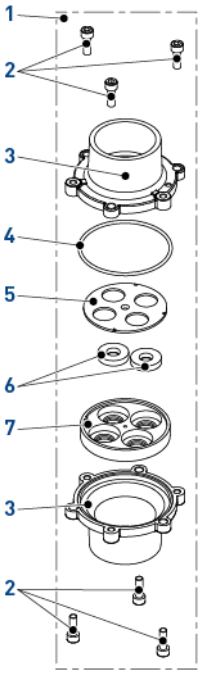
Item	Part number	Description	Packaging quantity
-	A3-TH02-516	Lower lateral 516 mm, tank 55"	8
-	A3-TH02-578	Lower lateral 578 mm, tank 63"	8
7	ATD3-H80-00	Hub	2
8	A-3100-05C	Prolongation	2
9	A-3100-03C	Adaptor	1

11.6.12. Hot water, flanged 6", tank 21" to 36", side mounted valve, top and bottom distribution system, external flange 65 mm connection, slots 0.2 mm



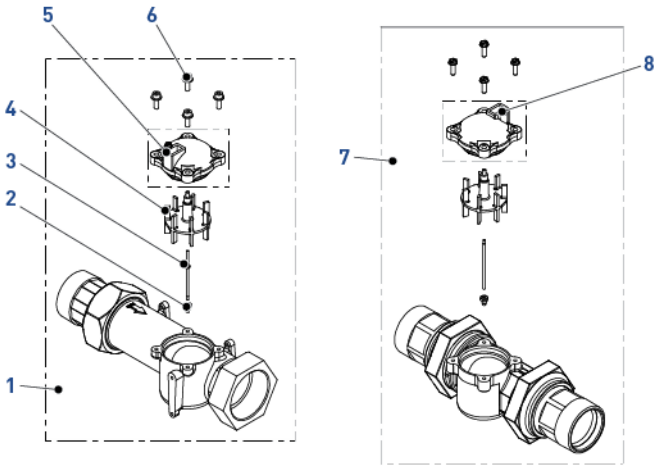
Item	Part number	Description	Packaging quantity
1	A3-2721-F6	Bottom distribution system assembly, tanks 21" - 24"	1
-	A3-2730-F6	Bottom distribution system assembly, tank 30"	1
-	A3-2736-F6	Bottom distribution system assembly, tank 36"	1
2	A3-TH02-175	Lateral 175 mm, tanks 21" - 24"	6
-	A3-TH02-268	Lateral 268 mm, tank 30"	6
-	A3-TH02-330	Lateral 330 mm, tank 36"	6
3	A3D-H60-00	Hubcap	1
4	ATD3-H60-00	Hub distributor	1
5	A-3100-04C	Prolongation	2
6	A-3100-02C	Adaptor	1

11.7. DLFC parts list



Item	Part number	Description	Packaging quantity
1	25580-30	2" DLFC assembly 3150/3900 - 30 gpm	1
2	25177	Screw	10
3	27913-21	2" Flow control housing - BSP	2
4	16804	O-ring	1
5	16650	Cover plate DLFC	1
6	16736	Flow controller washer 15 gpm	2
7	16649	Holder DLFC buttons	1

11.8. Meters parts list



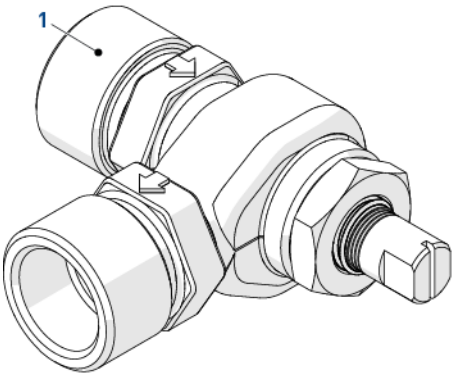
Item	Part number	Description	Packaging quantity
1	18393	Meter assembly 2" electronic	1
2	15532	Impeller shaft bearing	1
3	BR15432	Impeller shaft for impeller 15374-01	1
4	BR15374-01	Impeller 2"	1
5	18330	Meter cover assembly electronic	1
6	12473	Screw hex washer 10-24x⅝ 18-8SS	10
7	60625-10	Meter assembly 2" electronic plastic	1
8	18330	Meter cover assembly electronic	1

11.9. Kit meter & Meter cables list

Item	Part number	Description	Packaging quantity
-	28283	Kit Meter NT - NXT 1" Brass	1
-	28284	Kit Meter NT - NXT 1½" Brass	1
-	28285	Kit Meter NT - NXT 2" Brass	1
-	28295	Kit Meter NT - NXT 2" Plastic	1
-	28286	Kit Meter NT - NXT 3" Brass	1
-	28461-04	In-Line Meter 1¼" BSP Plastic	1
-	28114-06	Meter Cable 0.7 m	1
-	28114-08	Meter Cable 2.5 m (Delivered with each meter kit)	1
-	28114-09	Meter Cable 7.7 m	1

11.10. Other components list

Mixing assembly



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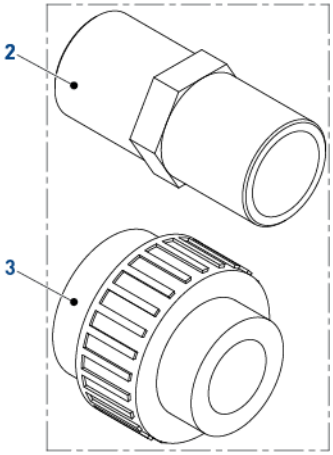

Item	Part number	Description	Packaging quantity
1	BU61564-10	Mixing Assembly 1" Industrial	1
2	28181	2 PVC Union Female 1" BSP	1
3	16453	1 Male Pipe Fitting 1"	1

12. Scrapping

The device must be scrapped in accordance with directive 2012/19/EU or the environmental standards in force in the country of installation. The components included in the system must be separated and recycled in a waste recycling 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 do not collect used product for recycling. Contact your local recycling center for more information.

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