Euro-Clear Ltd.
Water purification and treatment equipment manufacturer and wholesale distributor
Tel: +36 96 544-240 • E-mail: contact@euro-clear.eu • Web: www. euro-clear.eu

MECHANIC GUIDE

INDUSTRIAL WATER SOFTENER EQUIPMENTS

Manual regeneration (HM) and semi automatic (FLM) single columned water softener equipments

Semi automatic single columned
BlueSoft-40HM
BlueSoft-60HM
BlueSoft-40FLM
BlueSoft-60FLM

Before using the equipment, please read carefully the whole guide of handling and use.

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1. DEFINITION AND FUNCTION OF THE EQUIPMENT

The equipment is an automatically operated and regenerated water softening equipment filled with cation exchanging strongly acid resin regenerated in Na form.

1.1. Water has got its natural circulation. Precipitation with neutral pH absorbs part of the CO2 of the air so it becomes slightly acid. After that, any water that filtrates into the soil and surface water absorb up to a certain extent the elements that create the soil. Among these salts, you can mostly find Calcium, Magnesium and in a lesser amount there is iron, manganese and a lot of other elements. Building up of lime scale is a process while salts dissolved in water get separated so on the inner walls of heat emitter and heating equipments there is a deposit of lime scale, which causes congestions, reduced heat emission, lower efficiency and often definitive damages. At increasing temperatures, the process can get even faster, so the following equipments have a higher risk of having a limescale deposit: boilers, parts and pipes of central heating and hot water supplying systems, washing machines and dishwashers, steam irons, etc.

THE WATER SOFTENER STOPS THE DEPOSIT OF LIMESCALE

Ion exchanging water softening procedure thrives on the fact that the equipment changes the calcium and magnesium ions of the salts dissolved in water into natrium ions. Natrium salts do not cause limescale deposits even when there is heat.

2. TECHNICAL PARAMETERS OF THE EQUIPMENT

Min. pressure	: **2,5**	**bar**
Max. pressure	: **6**	**bar**
Min. temperature	: **4**	**C°**
Max. temperature	: **25**	**C°**
Hardness	: under **0,1 Gh**	
Content of salt	: invariable	
pH	: invariable	
Regenerating chemical	: pure **NaCl tablet**	
Its quantity	: **0,1 - 0,24 kg/ litres of resin per column/reg.**	
Connection to electricity	: **230 V, 50 Hz**	

The quality of the water to be treated needs to be near drinking water quality.

Max. iron and manganese content	: 0.1 mg/l
Max. consumption of potassium-permanganate	: 10 mg/l
Max. content of floating material	: 2 mg/l

Detailed technical parameters of manual regeneration and half automatic one columned water softener equipments:

Part number	Appellation	Connection	Resin liter	Softened water volume	Weight kg	Size (mm) H x W x L
BlueSoft-40HM	Mobile system charger water softener, one columned, manual regeneration	3/4″	10	2 – 3 m³/regeneration	14	540 x 270 x 270
BlueSoft-60HM	Mobile system charger water softener, one columned, manual regeneration	3/4″	15	3 – 4 m³/regeneration	20	1000 x 270 x 270
BlueSoft-40FLM	Mobile system charger water softener, one columned, manually launched, half automatic, with brine tank	3/4″	10	2 – 3 m³/regeneration	16	620 x 500 x 270
BlueSoft-60FLM	Mobile system charger water softener, one columned, manually launched, half automatic, with brine tank	3/4″	15	3 – 4 m³/regeneration	22	1080 x 420 x 230

3. MAIN PARTS

Basically, the equipment consists of the following main parts.

3.1. Columns to keep resin

They are meant to store the resin charge. The columns are PE pressure tanks developed especially for treating water with polyethylene padding. Outside they have epoxy resin coat rolled by fibre.

Their features are that they last long, have little weight and resist to chemicals and corrosion.

3.2.Resin to exchange ion

Its function is to complete ion exchanging processes on the resin bed. Ion exchanging processes are the base of the chemical operation of the equipment.

3.3. Blocked valve to regenerate

Its task is to ensure that the mechanical work processes of the equipment are completed in a programmed, regulated way.

3.4. Brine tank

Its task is to produce the brine solution necessary for the regeneration and to store the regeneration salt.

4. OPERATION OF THE EQUIPMENT

4.1. *CHEMICAL OPERATION*

The chemical operation of the equipment thrives on the fact that the resin that gets filled in is an ion exchanging resin. The resin has this property thanks to the active groups that have free valence and are planted in the neutral polystyrene substrate.The affinity of this compound is relatively small to the natrium and big to the calcium and magnesium. During the operation, the resin that exchanges ion and is loaded with Natrium keeps changing the calcium and magnesium ions of the water into natrium ion. This process itself is meant to be the water softening, and it carries on as long as there is natrium on the active groups of the resin.

$$Ca(HC0_3)_2+2Na\text{-}R=Ca\text{-}R_2+2NaHC0_3$$
$$Mg(HC0_3)_2+2Na\text{-}R=Mg\text{-}R_2+2NaHC0_3$$
$$CaS0_4+2Na\text{-}R=Ca\text{-}R_2+Na2S0_4$$
$$MgS0_4+2Na\text{-}R=Mg\text{-}R_2+Na2S0_4$$
$$CaCl_2+2Na\text{-}R=Ca\text{-}R_2+2NaCl$$
$$MgCl_2+2Na\text{-}R=Mg\text{-}R_2+2NaCl$$

If the ion exchanging resin gets saturated with calcium and magnesium ions during the operation, the resin is considered discharged.

The discharged resin needs to be regenerated. During regeneration, calcium and magnesium ions get removed from the active groups of the resin and we plant natrium ions to their place. Due to the different affinity, this process can happen only if there is a significant surplusage of natrium. In practice, we get a 10 % NaCl solution to flow through the resin during regeneration. The natrium from the solution gets connected to the active groups of the resin, and the removed calcium and magnesium get connected to the chloride ion and get into the channel together with the regeneratum.

Apart from the calcium and magnesium, there are several other elements in the water. In case the content of iron and manganese is high, the resin to exchange ion can get damaged partly reversibly, partly irreversibly. The harmful deposit on the resin can be removed by etchant, but, for a safe operation, only drinking water quality water is allowed for operating the equipment. **Where the quality of the water is worse, pre-filtering must be completed and iron must be removed.**

4.2. MECHANICAL OPERATION OF THE EQUIPMENT

While the equipment is operating, the mechanical operation of the blocked valve provides the automatical fulfillment of the processes of water production and regeneration.

In case of FLM type, we start the regeneration process with a button push. After the manual launch of the regeneration, the blocked control valve will automatically do the regeneration process (half automatic).

4.2.1. WATER PRODUCTION

During water production, the water enters the column to keep resin through the upper filter, and it flows through the ion exchanging resin from up to down. The softened water leaves the equipment through the lower filter.

4.2.2. PRE-WASH

During pre-wash, the way of the water is the same as the water production's way, but the water leaves the equipment through the drain.

4.2.3. BACKWASH

During backwash, the water enters the column to keep resin through the lower filter and it flows through the ion exchanging resin from down to up while the resin's charge gets stirred up. The water of backwash gets out into the channel through the drain.

4.2.4. BRINE UPTAKE (regeneration)

As it gets through the water jet pump built into the blocked valve (injector), the water uptakes saturated brine from the brine tank and dilutes it up to about of 10 per cent. This solution enters the column to keep resin through the upper filter, and it flows through the resin charge from up to down. While the solution is flowing through, the resin charge gets regenerated. The sewage water of the regeneration leaves through the lower filter at the drain into the channel.

4.2.5. *SLOW WASH*

The slow wash is a process that has the same direction as the brine uptake. Slow wash starts when the brine tank runs out of salt solution. Then the salt valve fixed into the brine tank closes and stops the sipping effect from sipping air into the column to keep resin. During slow wash, the salt solution gets removed from the resin charge.

4.2.6. QUICK WASH

During quick wash, the water enters the column to keep resin through the lower filter, and it flows through the resin charge from down to up. It leaves through the upper filter at the drain into the channel. During quick wash, the traces of the regenerating chemical get removed and the right water quality gets set up.

4.2.7. DOWNFLOW WASHING

The water enters the column to keep resin through the upper filter and flows through the resin charge from up to down. It leaves through the lower filter at the drain into the channel. During the downflow washing the resin charge that has been stirred up during the quick wash gets recompressed.

4.2.8. *FILLING UP THE BRINE TANK*

The water enters the column to keep resin through the upper filter. It flows through the resin charge from up to down. It gets into the brine tank through the lower filter then through the pipe which soaks the salt up. Filling back is time controlled.The water for filling up makes a saturated salt solution with the salt tablet in the brine tank and it is used up during the next regeneration.

4.3. DETAILED DESCRIPTION OF THE WAY THE CONTROL WORKS

The automatical blocked valve completes all the operation processes (operation, regeneration) on the basis of the setting up of the clockwork engine. The automatical blocked valve gets the mechanics of the valves to work as well.

The build-up and setting up of the blocked valve are described in the annex.

The regeneration of the overflow equipments is completed manually. Its steps are the following:

- After the resin gets discharged, unroll the treated overflow adapter from the column.
- Fill pure regenerating salt tablet into it (resin litre x 0,24kg).
- Twist the overflow adapter back onto the column.
- Leave the salt tablet on the charge for about 4 hours.
- Rinse the rest of the brine out of the column, then the water softening equipment is ready to make soft water again.

5. INSTALLATION AND SETTING UP OF THE EQUIPMENT

5.1. CONDITIONS OF INSTALLATION:

A room with flat, horizontal and hard flooring is needed for the installation of the equipment. The flooring and the direct surroundings of the equipment must resist to the corrosive effect of the brine. The equipment must be installed in a room the temperature of which is between +5°C to +40°C. The temperature of the raw water to be treated must not exceed +30 °C. The equipment must not be installed in a strongly damp or dusty room. It must be protected from frost, radiant heat and ultraviolet radiance.

Near the equipment, drain connection and 230 V 50 Hz grounded, electric socket must be provided. In order to diminish risks, we advise to install the equipment into a room provided with floor drainage.

Below water pressure of 2,5 bars, proper regeneration is not guaranteed, so in this case we advise to build in a equipment to increase pressure.

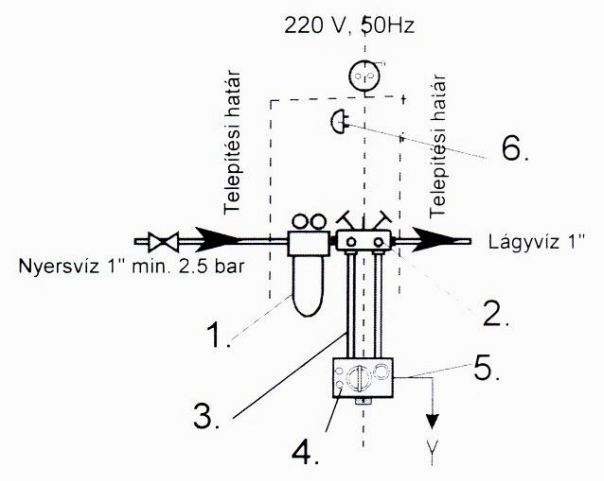
In case the water pressure from the water system exceeds 6 bars, a equipment to decrease pressure has to be fixed in front of the equipment.

Fluctuation of pressure higher than ±0,5 bar is not allowed! Mechanical protective filter must be built in front of the equipment. It is important that the mechanical protective filter filters contamination bigger than 100 microns.
The equipment does not have any extra protection against water or electricity shortage. If needed, it must be provided while installing.

5.2. CONNECTION OF THE EQUIPMENT *(it is the responsibility of the customer/owner)*

It is the customer's task to have the equipment connected to the water, drain and electricity systems. The operator of the equipment and the specialist to complete the installation should both check if the equipment has been installed as described in the guide for use and handling and if the conditions to diminish risks of damage are given. The setting up of the equipment can be completed by the partner of the Euro-Clear Ltd's service that has a partnership contract. Setting up the equipment only means the setting up of the automatical control valve fulfilling the local conditions.

When setting up, the valid local regulations, general instructions and hygiene regulations must be followed and the technical parameters given above must be respected.



1. Pre-filtering equipment
2. Montageblock or built by-pass branch
3. Flexible tube pair
4. Control valve of the water softening equipment
5. Drain
6. Electrical outlet*

The pre-filtering equipment No. 1 and the montageblock No. 2 are already fitted in when the customer gets them. The montageblock can be replaced by a by-pass branch built from 3 valves. When building in this unit into the pipe, make sure that you connect the raw water onto the filter „1" and the softened water that comes out has to be connected onto the montageblock „2".
The water softener and the montageblock can be connected by the flexible tube pair No. 3. When connecting, pay attention to the flow direction of the water which is marked by the arrows at the montageblock No. 2 and the control valve No 4.

There is a hose outlet on the control valve No. 4, which is the drain of the equipment. The water that comes out has to be led into the sewage canal. This job can be completed by the plastic hose No. 5. The hose must be pressure resistant as a simple garden hose breaks after a while and the narrow diameter can stop the completion of the regeneration. The sewage water comes out of the equipment under pressure, but it must be led by free outlet.

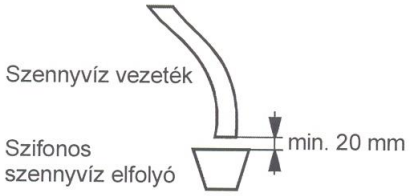
An electrical socket of 230 V, 50 Hz must be built within a distance from the equipment that allows the completion of the connection of the prong plug number 6 without the electric cable's getting tight.

During backwash, water comes out from the pre-filtering equipment No. 1. It is advised to connect the sewage connection snag into the drain. In this case the sewage water will come out under pressure, too.
On the side of the regenerating tank of the water softening equipment there is an overflow snag which the superfluous water can get through in case of a breakdown. The liquid has got a hydrostatic pressure, so it can be led only by using floor drainage *or* a siphon drainage fixed at a low level.

The safety overflow snag of the tank can be led to the drain point by a ½" pressure resistant plastic tube. The water that eventually comes out does not have any pressure, so it must be led to the drain or into the raiser by a slope.

The drain of operation of the water softening equipment and the overflow of the brine tank can be connected to the sewage leading points respecting the following rules.

- Respecting DIN 1988, the tube of the rinsing water and the overflow tube must be fixed at the sewage water connection point, at least at a distance of 20 mm compared to the highest drain water level, so that the water can get out of the equipment smoothly.



- Make sure that the water softener drain line and the brine overflow line are connected to the drain separately. The high-pressure rinsing water flowing out of the control head (4) during regeneration must not enter the brine tank via the overflow line.
- The part which is marked by a „*" is not needed in case of HM equipment.

5.3. SETTING UP OF THE EQUIPMENT

After the jobs mentioned in point 5.2 have been completed, you have to order the setting up of the machine from Euro-Clear Ltd at one of the contact details below:

Mailing address: 9071 Gönyű, Béke u. 2
E-mail address: contact@euro-clear.eu
Web address: www.euro-clear.eu

After the equipment has been set up, the copy of the warranty document filled in by the person having completed the setting up has to be sent to the address above in a verifiable way.

The fee of the setting up jobs gets calculated on the basis of the actual price list.

Attention! For FLM type equipment's programming, the RX-ADJ port is essentail. The product needs to be ordered separately, it is not part of the equipment.

6. INSTRUCTIONS FOR HANDLING

1./ Check daily the
- hardness of the incoming water and the
- hardness of the softened water,
they must be noted in the operation diary.

2./ Check daily
- the quantity of the regenerating salt in the brine tank, fill it up if necessary, note it in the operation diary.

3./ In the brine tank, there must always be an undissolved solid salt tablet enough for one regeneration.

4./ Make sure you keep checking the brine consumption as this is the way you can find out if the equipment regenerates automatically.

5./ You need to check daily the pressure of the incoming water on the pressure gauge. In case it decreases by more than 0,5 bars, clean the pre-filter.

6./ Remove dust from the equipment with a dry cloth every two weeks.

7./ The pre-filtering equipment must be rinsed back depending on the extent of the contamination but at least once a week. It must be done with the sewage water drain tap that you can find on the bottom of the equipment. Rinsing back must last for at least 15-20 seconds.

8./ Clean the brine tank once a month.

9./ Make sure that the equipment keeps getting 230 V, 50 Hz electricity all the time, for 24 hours and it is under system pressure continuously.

7. PROCESS OF MEASURING WATER HARDNESS

The kit that measures water hardness contains a measuring cup and a plastic vial containing some titrating liquid. You can find the same liquid in both of the viols.

- Before testing, the measuring cup needs to be rinsed and then filled up with the water sample to be tested up to the mark of 5 ml. Add a drop of titrating liquid to the water sample in the cup, and then shake the 2 liquids gently.

- If the first drop of titrating liquid makes the water greenish, the tested water is soft water.

If it is not the case, keep repeating the operation until the red colour of the mixture gets greenish. Each drop of the titrating liquid is the equivalent of 1 German hardness, so the hardness of the tested water sample is the same as the number of the drops which are added as long as the sample has got greenish.

- By filling the cup up to the level of 10 ml, you can measure by 0,5 grades if you follow the method mentioned above. In this case, 1 drop of titrating liquid will be the equivalent of 0,5 nk.

8. WARRANTY, GUARANTEE

In case of non-perfomance by the producer, the owner of the equipment can benefit from all warranty rights in 306-309. § in the Civil Code.

The owner of the equipment can claim for warranty and guarantee only by showing both the receipt that has been received when buying the equipment and that proves the payment of the complete price and the warranty document that has been filled in.

Warranty and guarantee do not cover faults that have been caused by the following:

- The product has not been used properly, the instructions of the way of handling, using, installing or maintaining etc. have not been respected
- The operation diary has not been kept
- the necessary corrective maintenance has not been completed, or has not been done by the designated professional servicing company,
- the product's nature has been transformed, changed
- the owner of the equipment has not completed their liability of reducing risks of damage
- Defects, damages and other problems caused by improper transportation and storage of the product.

Warranty and guarantee claims can be validated only in case the operator of the equipment sends to the producer both pages of the operation data sheet filled in and signed by the professional mechanic in charge of setting up of the equipment. It must be sent in a provable way.
Please send back to the address below both pages of the data sheet of setting up that have been filled in and signed:

Euro-Clear Ltd.
Mailing address: 9071 Gönyű, Béke u. 2
E-mail: contact@euro-clear.eu

Euro-Clear Ltd.
Water purification and treatment equipment manufacturer and wholesale distributor
Tel: +36 96 544-240 • E-mail: contact@euro-clear.eu • Web: www. euro-clear.eu

DATA SHEET FOR SETTING UP

Name of specialist to complete setting up: …….

Contact details of the specialist completing the setting up

- Mailing address: …….
- Telephone number: …….
- E-mail address: …….

Name of the company selling the equipment: …….

Contact details of the company selling the equipment

- Mailing address: …….
- Telephone number: …….
- E-mail address: …….

Name of the operator of the equipment: …….

Contact details of the operator of the equipment

- Mailing address: …….
- Telephone number: …….
- E-mail address: …….

Type of the set up equipment: BlueSoft …….

Date of setting up: …….

.....
signature, stamp

Warranty and guarantee are only valid in case the setting up has been completed by Euro-Clear Ltd or its agent. You can order the setting up of the equipment at the contact details mentioned below.

Euro-Clear Ltd.
9071 Gönyű, Béke u. 2.
Tel: +3696/544-240
contact@euro-clear.eu

Data sheet for setting up in case of FLM

Yes

1. Check the mechanical and electricity connections as follows:
   - 1.1. Is a mechanical protection filter built in front of the water softener? ☐
   - 1.2. Is the pressure of the raw water convenient? (2,5 – 6 bar) ☐
   - 1.3. Are the directions of water flow convenient? (on the montage block, on the equipment) ☐
   - 1.4. Are the outlet of the softening rinsing water and the gravitation overflow of the brine tank connected separately onto the channel? ☐
   - 1.5. Is the electricity input right? (230V, 50HZ) ☐
   - 1.6. Has the hardness of the raw water been measured? ☐

   If yes, then the measured value is: .....nk^0

2. Program the water softener equipment's control valve through the RX-ADJ port.

   - 2.1. Setting the rinsing time (advanced settings)
   - 2.1.1. Has the time for Backwash been set up? ☐
   - 2..2. Has the time for brine absorption been set up? ☐
   - 2.1.4. Has the time for water refill been set up? ☐
   - 2.1.3. Has the time for rinse been set up? ☐

   We can start the regeneration after pressing the regeneration button ( ) once.

3. Starting manual regeneration, checking function cycles:
   - 3.1. Backwash (water gets onto the channel intensively). Is everything all right with the function cycle? ☐
   - 3.2. Brine absorption (little water comes out into the channel, the cabinet is running out of brine). Is everything all right with the function cycle? ☐
   - 3.3. Water refill into the cabinet. Is everything all right with the function cycle? ☐
   - 3.4. Backwash (onto a channel of higher volume of water flow) ☐

4. After finishing regeneration, check the hardness of the water coming down from the equipment. Without back mix, is the hardness of the water made by the equipment lower than 1 nk? ☐
5. Set the water hardness up to at least 5 nk in compliance with the regulation of the government 5/2023. (The equipment can make water of lower nk, too.) Possibilities of setting up hardness: On the montage block or helped with by-pass valve on the control valve.
   Water hardness that has been set up: .....nk^0
6. Filling up the brine tank with tablets of salt. (Recommended quantity is at least the necessary daily salt.)
7. Training the staff handling the equipment. ☐
8. Filling in the warranty document ☐

In case of HM equipment

1. Check the connection of the equipment that has been done by the mechanic.
   - 1.1. Is a mechanical protection filter built in front of the water softener? ☐
   - 1.2. Is the pressure of the raw water convenient? (2,5 – 6 bar) ☐
   - 1.3. Are the directions of water flow convenient? (on the montage block, on the device) ☐
   - 1.4. Is the rinsing water's adherent connected? ☐
   - 1.5. Has the hardness of raw water been measured? ☐
   - 1.6. Has the hardness of the raw water been measured? ☐
   - 1.7. Did you fill the warranty document? ☐

WARRANTY DOCUMENT

In case the device is properly used, the producer undertakes a warranty of **12 months** starting from the setting up, but maximum **18 months** starting from the date of issuing the quality certificate.

DATE OF SETTING UP:

…….....

…….....
signature, stamp

The warranty and guarantee are only valid in case the setting up has been completed by Euro-Clear Ltd. or its agent. You can order the setting up of the device at the details mentioned below.

Please send us back the warranty document, setting up data sheet completely filled. In other case the warranty is not valid.

Please keep the warranty document, setting up data sheet and quality certificate for administration purposes in the future.

In case of a breakdown or fault, please inform us in written at the e-mail address contact@euro-clear.eu about the problem that has occured.

Euro-Clear Ltd.

Water purification and treatment equipment manufacturer and wholesale distributor

Tel: +36 96 544-240 • E-mail: contact@euro-clear.eu • Web: www. euro-clear.eu

QUALITY CERTIFICATE

<table>
<tr><td colspan="2">1. Issuer of the quality certificate:

Euro-Clear Ltd.</td><td colspan="2">2. Producer:

Euro-Clear Ltd.</td></tr>
<tr><td colspan="4">3. Punctual name of product (its function):

Automatic water softening device. Type: BlueSoft……..</td></tr>
<tr><td>4. Quantity

1</td><td colspan="2">5. Weight and (or) size:</td><td>6. Date of production:

……..……</td></tr>
<tr><td colspan="2">7. Can be used</td><td colspan="2">8. Identifying product
a./ Control valve number:
b./ ITJ-number: 36-10
c./ Part number:
d./ Other identifying details:</td></tr>
<tr><td colspan="2">9. Delivery and storage regulations:
Transportation and storage must be done in standing position. Store in a dry, cool place, away from water and precipitation. Do not expose to direct sunlight or UV radiation. Extremely frost-hazardous.</td><td colspan="2">10. Wrapping:
Cardboard.</td></tr>
<tr><td colspan="4">11. Important features of the product (with punctual technical data, results of measurement):

Flow of volume: ……..….m^3/h

Quantity of resin : ……litres

Quality and classifying: Convenient!</td></tr>
<tr><td colspan="2" rowspan="3">14. Other details:
Serial number:</td><td colspan="2">12. Method of inspection for checking the quality of the product: During production</td></tr>
<tr><td colspan="2">13. Regulation for use and handling:
As it is mentioned in the guide for use and handling</td></tr>
<tr><td colspan="2">15. Signature of the person issuing the quality certificate:

Date:
Gönyű, 20……..…..

.....
signature, stamp</td></tr>
</table>