SILEX 11 AND 21

WITH CONDUCTIVITY METER ST3

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1. PREFACE

The instructions are made so that they can be followed section by section. It is recommended to follow the instructions carefully since any service calls due to faulty installation, plant start, operation or insufficient maintenance are not covered by our guarantee.

2. PLANT DATA

Water temperature	max.	35°C
Inlet water pressure	max.	6 bar
Pipe connection, to, from, and drain		DN 15/20 mm PVC
Connection between tank and operating unit		dia. 10 mm hose
Electrical connection		1 x 230 VAC, 50 Hz
	transformed into	12 VAC, 50 Hz

SILEX module	Filling of ion exchangers litres	Standard flow "Q" litres/hour	**Standard pressure loss "P" at 10°C bar	Max. flow "Qmaks." litres/hour	Max. pressure loss "Pmaks." at 10°C bar	*Basic capacity litres °dH	Transport weight of drained tank approx. kg
11	12	240	0,2	480	0,8	12900	15
21	21	420	0,5	840	2,0	22700	24

* The basic capacities are stated at a temperature of 10°C with conductivities under 5 µS/cm, approx. 60 % of the capacity is under 0.1 µS/cm. The capacity is increased by approx. 10 % with conductivities up to 20 µS/cm.

Temperature correction factor for the conductivity: µS/cm x Factor = corrected conductivity.

	5°C	8°C	10°C	15°C	20°C	25°C	35°C
Factor	0.88	0.95	1.0	1.12	1.25	1.37	1.63

** Temperature correction factor for the pressure loss: P x Factor = P_{temp}.

	5°C	8°C	10°C	15°C	20°C	25°C	35°C
Factor	1.2	1.1	1.0	0.95	0.9	0.85	0.8

3. GENERAL INFORMATION

Plant description
A complete SILEX system comprises a stainless steel tank and a wall-mounted operating unit with operating valves and a conductivity meter that continuously indicates the conductivity of the demineralized water.

The SILEX tank contains cation and anion exchange resins with a certain demineralization capacity. At exhausted capacity, the used tank unit is exchanged for a regenerated unit. The used unit is sent to the regeneration centre of

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Here the unit will be regenerated and returned ready for use.

Quality requirements of the untreated water
The temperature of the water to be demineralized must not exceed 35°C and must not contain iron, manganese, oil, or large quantities of organic matter. Common mains water will normally meet these requirements.

The contents of dissolved salts in the water - conductivity
The electronic conductivity meter continuously indicates the conductivity of the demineralized water in µS/cm. The conductivity is a measure for the contents of dissolved solids in the water. The lower the conductivity, the smaller the contents of dissolved solids.

Examples:

Distilled water		7-10	µS/cm
Demineralized SILEX water	less than	0.1	µS/cm.

Storage of a SILEX tank
On account of the ion exchange resins, the SILEX tank unit must be stored in a frost-free room. An unused tank must be stored as cool as possible - best at refrigerator temperature, i.e. 4-8°C. Storage at higher temperatures adds to the risk of growth of micro-organisms just like the tank's ability to produce water of low conductivity is reduced.

Life
Tanks that are stored at refrigerator temperature should be used within six months from the delivery date. When stored at room temperature, the tanks should be used within three months. It is of greatest importance for the life of the tank units that they are stored and exchanged under so sterile conditions as possible so that the risk of contamination from the surroundings and the operator is minimized.

Connection to drinking water supply
Water treatment plants treating water from a drinking water supply shall be protected against a backflow from the water treatment plant into the drinking water supply. This can be done with an approved backflow prevention valve or a check valve between drinking water supply and water treatment plant.

4. INSTALLATION INSTRUCTIONS

4.1 General installation requirements

1. The plant must be installed in a dry and frost-free room.

2. A suitable floor drain should be close to the plant.

3. If water hammering can occur, install a water hammer damper, for instance a diaphragm pressure expansion tank that is dimensioned according to the conditions.

4. If the water in the tank can be heated during standstill so that the pressure exceeds the allowable operating pressure of 6 bar, install a pressure release valve.

5. If the inlet water pressure can exceed the allowable operating pressure of 6 bar, provide a pressure reducing valve on the inlet of the plant.

6. **N.B.:** Using the SILEX system, a small and limited discharge of very small particles of ion exchange media cannot be excluded. If such a discharge can harm the subsequent installation in any way, install a suitable filter in the outlet line of the SILEX system, see Fig. 1 pos. 14.

4.2 Installation

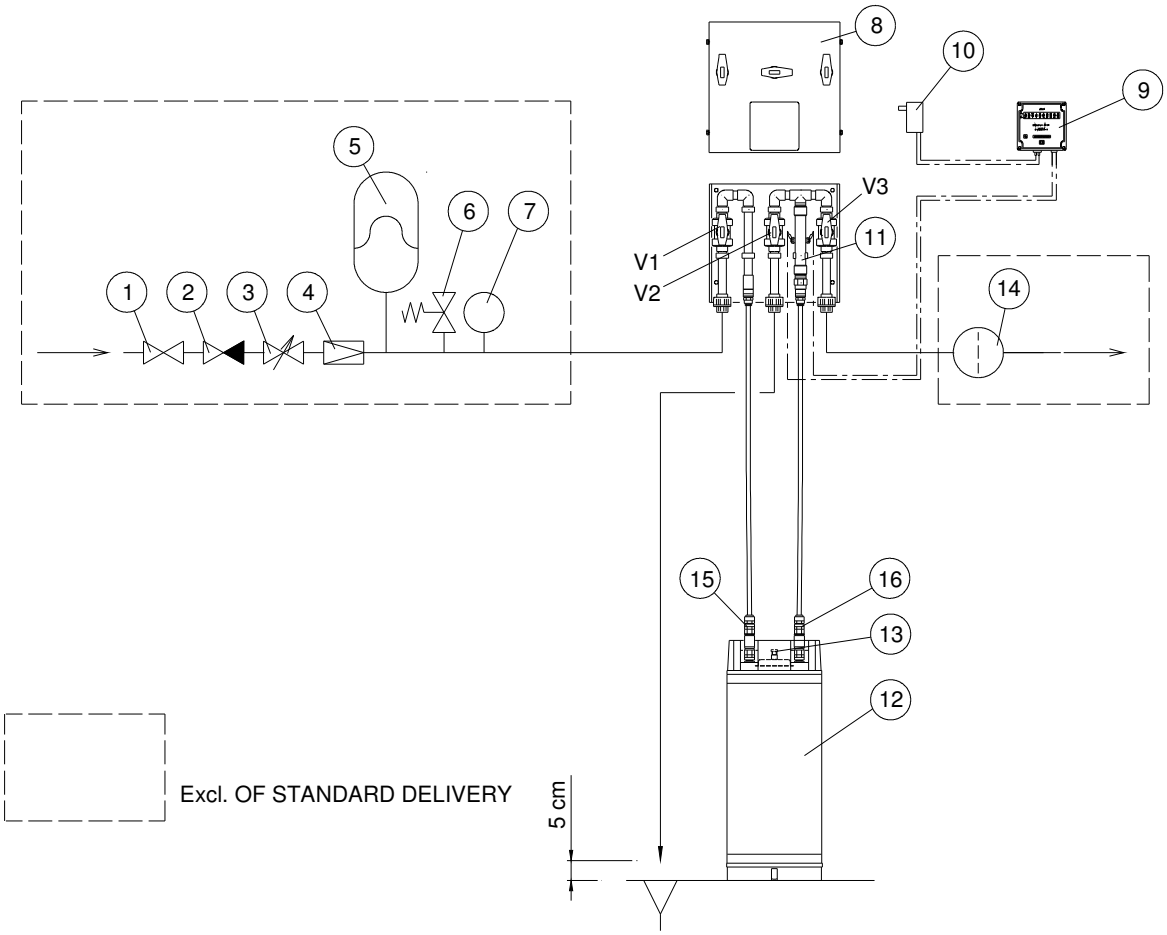
1. Mount the operating unit on the wall or a bracket with the lower edge app. 0.5 m over the tank top. Screw size: 8 mm.

2. Divide the dia. 10 mm plastic hose into two pieces of suitable length in accordance with the distance between the operating unit and the connections on the tank. Mount the hoses in the operating unit and in the supplied couplings. Thrust the hoses into the nipples of the operating unit and pull them in reverse direction (the hoses are secured). The same is done with the loose couplings for the tank. Black coupling to black nipple (inlet to the left). Blue coupling to blue nipple (outlet to the right).

3. Connect the operating unit to SILEX untreated water on the left side, treated water on the right side, and the drain in the middle. Connect the discharge pipe to app. 5 cm over an open floor drain.

4. Place the tank at the installation site and connect with the hose couplings. Seen as front view, the inlet is to the left (black coupling) and the outlet to the right (blue coupling).

5. Connect the conductivity meter to 12 VAC 50 Hz via the supplied transformer, see the section "Conductivity meter type ST3".



1. STOP VALVE.
2. NON-RETURN VALVE.
3. REGULATING VALVE.
4. PRESSURE REDUCING VALVE, IF ANY.
5. DIAPHRAGM PRESSURE EXTENSION TANK, IF ANY.
6. RELIEF VALVE, IF ANY, 6 BAR.
7. PRESSURE GAUGE.
8. OPERATING UNIT (SEE FIG.2.)
9. CONDUCTIVITY METER TYPE ST3.
10. TRANSFORMER FOR ST3 230/12V 50Hz, 6VA.
11. MEASURING CELL.
12. TANK.
13. AIRSCREW.
14. PARTICLE FILTER.
15. INLET (BLACK CONNECTION).
16. OUTLET (BLUE CONNECTION).

ACCORDING TO EN 61010-1 ITEM 1.4 THE PLANT IS INSTALLED UNDER INSTALLATION CATEGORY II.
TRANSFORMER SHALL COMPLY WITH EN 60742.

Fig. 1.

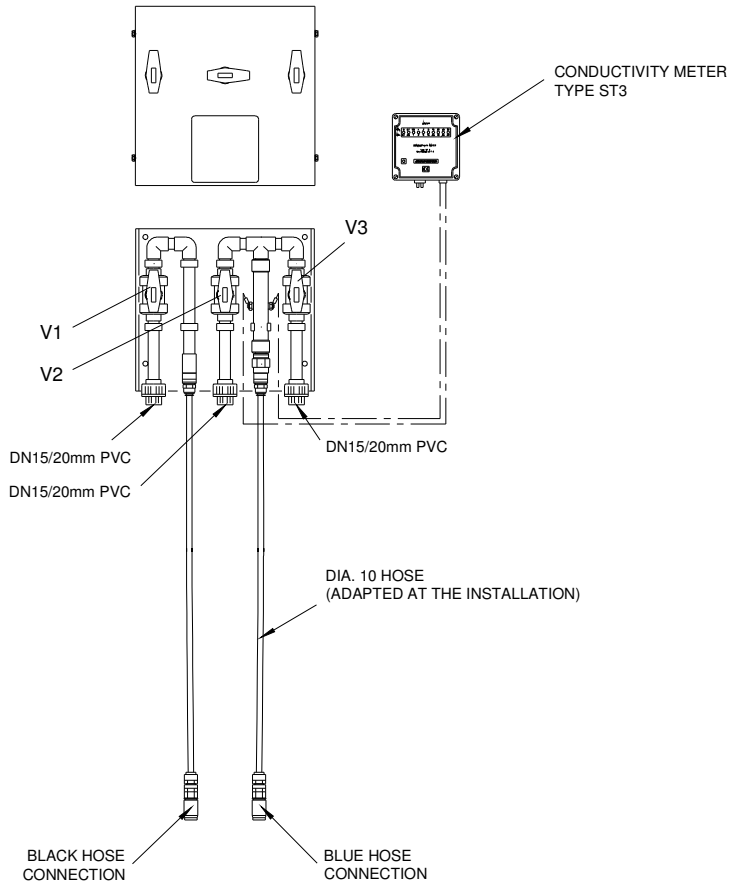


Fig. 2.

5. OPERATION

Table

Phase	Inlet valve (V1)	Drain valve (V2)	Outlet valve (V3)	Airscrew	
Connection/ disconnection				Closed	When the tank is connected, readjust the valves to "filling of water".
Filling of water				Open	When water comes out of the airscrew, readjust the valves to "quality rinse".
Quality rinse				Closed	When the conductivity is satisfactory, readjust the valves to "operation".
Operation				Closed	When the conductivity is unsatisfactory, readjust the valves to "drain phase 1".
Drain phase 1				Closed	When the water runs out of the discharge pipe, readjust the valves to "drain phase 2".
Drain phase 2				Open	When the water stops running in the discharge pipe, readjust the valves to "connection/disconnection" and exchange the used tank for a regenerated tank.

Valve position: Open

Valve position: Closed

6. CAPACITY CALCULATION

The volume of mains water that a tank can demineralize is calculated based on the basic capacity of the tank. The basic capacity is shown in the table in "Plant data".

The tank capacity is calculated by dividing the total salt content of the saline water converted into °dH into the basic capacity.

Example:
SILEX 21 has a basic capacity of 22,700 litres °dH.
The total salt content of the water corresponds to 20 °dH.
Calculated capacity:

22,700 divided by 20 = 1,135 litres.

N.B.: If the system is to polish demineralized water to obtain the lowest possible conductivity and silica content, the capacity must be calculated by one of our technicians.

7. CONDUCTIVITY METER TYPE ST3

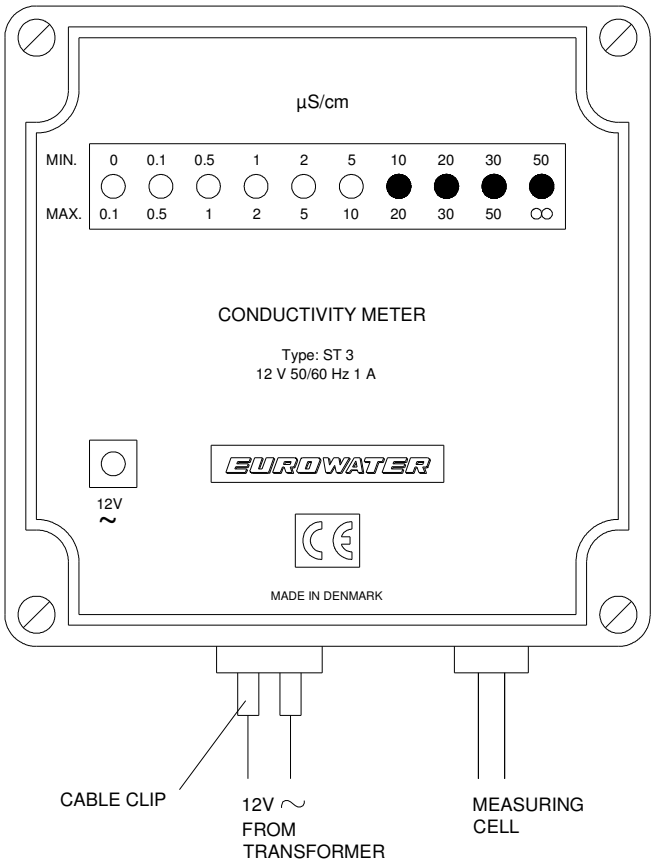


Fig. 3.

1. Connect the supplied transformer 230/12 VAC to the conductivity meter by means of the two red spade-shaped plugs. Plug the transformer into a 230 VAC wall socket. If the transformer wire shall be lengthened or shortened, use the supplied additional spade-shaped plugs.

2. Connect the wire with the two cable clips to each of the two terminals on the measuring cell. If the wire is to be lengthened or shortened, use the additional cable clips mounted on the measuring cell.

3. The meter is in operation when the green 12 VAC lamp is on. The conductivity of the water is continuously indicated by one of the ten light emitting diodes. A flashing of the diode every two seconds indicates a new measuring and the light stops at the light emitting diode for actual conductivity.

4. The scale indicates the min. and max. values of the conductivity. If for instance light emitting diode 4 from the left is on, the conductivity of the water is between 1 and 2 µS/cm.

5. At conductivities under 10 µS/cm, the light emitting diodes are yellow. At conductivities over 10 µS/cm, the light emitting diodes are red.

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Spare Parts

We offer a wide range of spare parts, service kits, and consumables. Our service cars are equipped with a broad range of spare parts, mainly of our own make. We continuously supply spare parts for more than 25-year-old plants.

Consumables: Water-softening salt. Test kits for periodical hardness control after the softening plant. Filter media for pressure filters. Ion exchange resins. Membranes for reverse osmosis plants. Filter bags. UV lamps.

Temporary Needs

In case of emergency or temporary needs, we offer a wide range of rental units. All units are ready for immediate installation and operation.

Contact

EUROWATER is an international group with subsidiaries in 12 countries servicing our customers through 19 local offices. Moreover, the company is represented in most of the other European countries through dealers that all are water treatment specialists.

In order to find your local sales and service office, please visit our international website.

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