



## Partial flow filter varioliQ:LB3000/4500 stationary

### Intended use

The varioliQ:LB3000 stationary and varioliQ:LB4500 stationary partial flow filters are used for the partial flow treatment of cooling circuits to maintain water quality in accordance with VDI/BTGA 6044.

The partial flow filters are used for partial flow treatment in closed heating and cooling circuits to produce filtered and fully softened water in accordance with VDI 2035 and AGFW-FW510 (VdTÜV 1466).

### Intended use

- The partial flow filters are designed exclusively for use in industrial and commercial applications.
- The partial flow filters can be used in new or existing systems.

- The partial flow filters are integrated into the return flow of the heating and cooling circuit as a bypass.
- Used in heating networks, CHP units and large buildings. According to the AGFW worksheet, 1-3 % of the circuit volume should be treated daily.
- The field of application is optimal for system volumes > 15 m<sup>3</sup>
- Use for flushing in the circulation process of pipework systems in the bypass flow in accordance with BTGA regulation 3.002



## Mode of operation

The filter module removes all insoluble elements such as scale, rust or dirt particles. Then, the softening module installed downstream fully softens the water. As a result, water quality in accordance with VDI 2035 and AGFW-FW510 (VdTÜV 1466) is achieved without changing the system content.

The fully automatic control electronics monitor all functions, such as the backwashing of the filter module with fresh water after differential pressure measurement and the regeneration of the softening module. Neither the filter material nor the ion exchange resin needs to be changed during the complete cleaning cycle.

### Filtration

The circulation water flows through the various filter layers in the filter module and is filtered. When the filter module is backwashed, the filter layers are flushed and loosened. The retained particles are flushed out to the drain.

### Softening

The filtered circulation water is then freed from the calcium and magnesium hardness formers via the softening module using the ion exchange principle and then returned to the circuit. The exhausted ion exchange resin of the softening module is regenerated using sodium ions via a fully automatic regeneration process.

The regeneration salt in the salt tank with a volume of 80 litres is sufficient for 13 regeneration processes. The salt tank is filled with fresh water to generate the brine. After the regeneration steps of salting, slow rinsing, backwashing, flushing out first filtrate and salt tank filling the partial flow filter starts to operate again.

### Make-up water feed

Leaks, steam diffusion, venting processes or after repairs, lead to water loss in the circuit.

Make-up fresh water feed, which is treated by the partial flow filter and fed into the circuit, can be manual or automatic.

#### Manual make-up water feed:

The make-up feed with fresh water can be switched on and off manually in the system control unit.

Make-up water feed continues until the level of the suction lance in the salt tank has been exceeded. After a delay of 15 seconds, the make-up water feed switches off.

If the level in the salt tank is not exceeded within the monitoring time, a fault occurs and the make-up water feed switches off.

#### Automatic make-up water feed:

A module for an automatic make-up water feed with integrated leakage monitoring is available as an option. A pressure measurement module, which is placed in the circuit, scans the system pressure. The control electronics activates and monitors the make-up water feed until the pre-set system pressure is reached again.

### Pressure booster

If required, an on-site pressure booster pump can be integrated into the fresh water make-up feed system as a bypass. The pressure booster pump can be used to increase the available fresh water pressure to the required pressure in the heating or cooling system.

## Structure

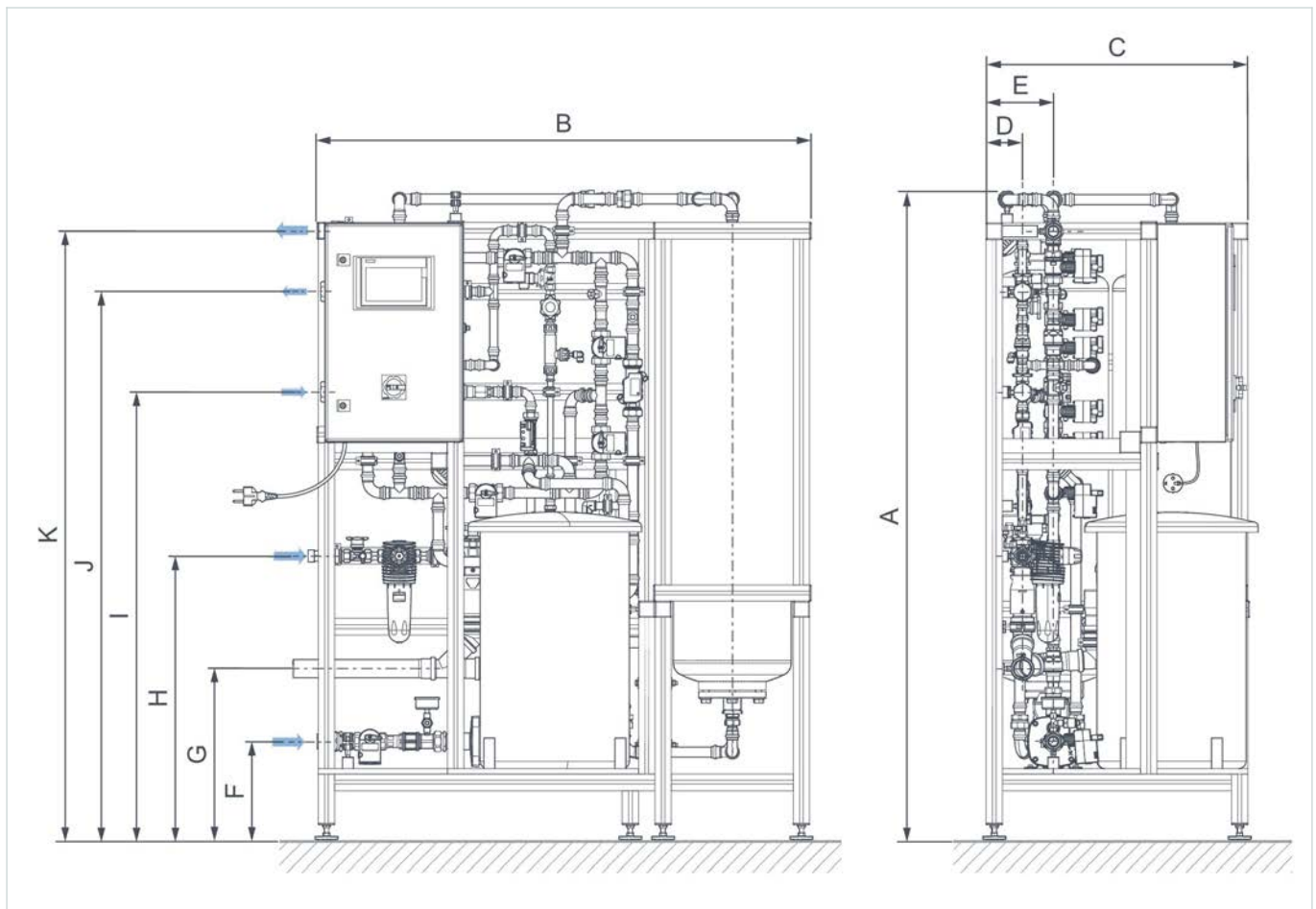
- Partial flow filter varioliQ:LB pre-assembled on a rack
- Operating circulation pump
- Fine filter for raw water
- Euro system separator
- Stainless steel filter module
- Stainless steel softening module
- Salt tank (80 litres) with light sensor for salt volume detection
- Switch cabinet with S7 PLC control unit and 7" LCD touchscreen
- Schuko plug with 3 m power supply cable
- Internal piping as a stainless steel press system
- Motorised ball valves to control the process steps within the system
- Inlet and outlet connections for heating and cooling circuits, raw water and optional pressure booster pump

## Scope of supply

- Partial flow filter varioliQ:LB
- Filter material
- Ion exchanger filling



## Technical specifications



Dimensions and weights			varioliQ:LB3000	varioliQ:LB4500
A	Height	mm	1780	1780
B	Width	mm	1350	1350
C	Depth	mm	720	720
D	Depth of waste water, raw water connection to the pressure booster pump	mm	100	100
E	Depth of heating/cooling circuit connection	mm	185	185
F	Height of heating/cooling circuit inlet connection	mm	270	270
G	Height of waste water connection	mm	470	470
H	Height raw water connection	mm	780	780
I	Height of pressure booster pump connection	mm	1230	1230
J	Height of connection to the pressure booster pump	mm	1480	1480
K	Height of heating/cooling circuit drain connection	mm	1670	1670
Operating weight		kg	620,0	630,0



Connection data		varioliQ:LB3000	varioliQ:LB4500
Nominal diameter raw water		DN 25	DN 25
Connection diameter raw water		1"	1"
Nominal diameter heating/cooling circuit		DN 25	DN 32
Connection diameter heating/cooling circuit		1"	1 ¼"
Nominal diameter of drain connection		≥ DN 50	≥ DN 50
Mains connection voltage	VAC	230	230
Mains connection frequency	Hz	50	50
Electrical power input operation	W	1000	1250
Electrical power input operation	kW	1	1,25
Protection		IP44	IP44
Protection class		I	I

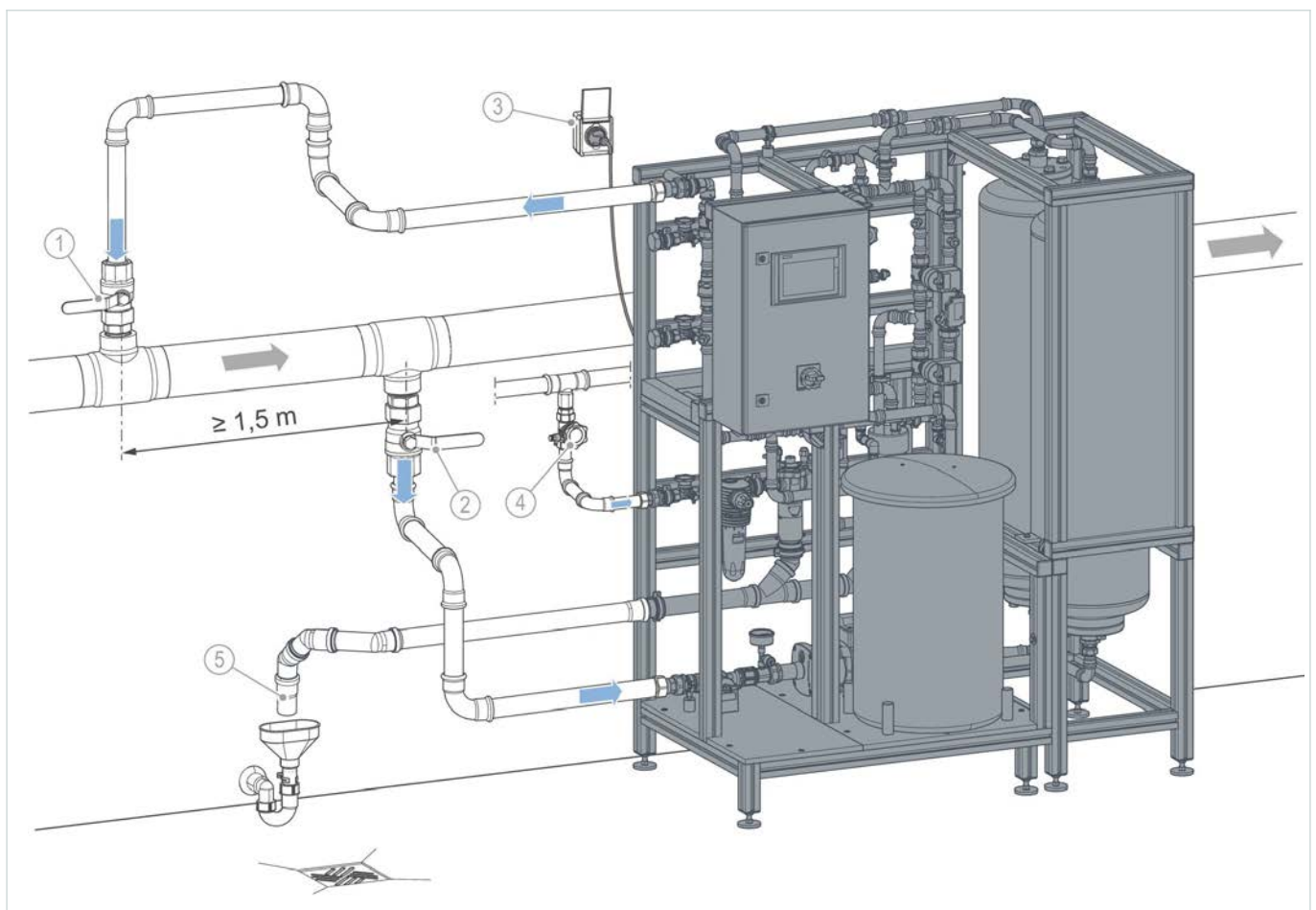
Performance data		varioliQ:LB3000	varioliQ:LB4500
Nominal pressure		PN 16	PN 16
Operating pressure raw water	bar	4 - 8	4 - 8
Operating pressure heating/cooling circuit	bar	2 - 14	2 - 14
Nominal flow	l/h	3000	4500
Nominal capacity variable per m <sup>3</sup> and °dH per exchanger	m <sup>3</sup> x °dH	140,0	140,0
Nominal capacity variable in mol per exchanger	mol	25,0	25,0
Regeneration time for a complete regeneration	min	50	50

Filling volumes and consumption data		varioliQ:LB3000	varioliQ:LB4500
Resin volume	l	50	50
Salt consumption at complete regeneration	kg	5	5
Regeneration salt supply	kg	≤ 65	≤ 65
Flushing water flow rate softening module	m <sup>3</sup> /h	≤ 0,8	≤ 0,8
Total waste water volume per complete regeneration	l	71	71
Quartz gravel 3.0 – 5.6 I	kg	12,5	12,5
Quartz gravel 1.0 – 2.2 II	kg	25	25
Quartz gravel 0.4 – 0.8 III	kg	50	50
Flushing water flow filtration module	m <sup>3</sup> /h	≤ 2,1	≤ 2,1
Total waste water volume per backwash	l	437	437



General data		varioliQ:LB3000	varioliQ:LB4500
Medium temperature (raw water)	°C	5 - 30	5 - 30
Medium temperature (heating/cooling circuit)	°C	5 - 90	5 - 90
Ambient temperature	°C	5 - 50	5 - 50
Air humidity (non-condensing)	%	≤ 70	≤ 70
<b>Order no.</b>		<b>707000070000</b>	<b>707000090000</b>

## Installation example



### Designation

- 1 Outlet connection to the heating/cooling circuit
- 2 Inlet connection from the heating/cooling circuit
- 3 Schuko socket

### Designation

- 4 Inlet connection raw water/make-up water
- 5 Drain connection DN 50



## Requirements for the installation site

Obey the local installation directives, general guidelines and technical specifications.

- Protection from frost, severe heat exposure and direct sunlight
- Protection from chemicals, dyes, solvents and their vapours
- Ambient temperature and radiation temperature in the immediate vicinity  $\leq 50\text{ °C}$
- Access for maintenance work (take required space into consideration)
- Sufficiently illuminated as well as aerated and ventilated
- Horizontal installation surface with sufficient load-bearing capacity to support the operating weight of the product

### Water installation

- coarse dirt filter installed upstream for heavy coarse dirt build-up


- Floor drain or corresponding safety device with water stop function (e. g. Safety device protectliQ)
- Salt water resistant lifting system in case the drain connection is located at a higher level
- Drain connection  $\geq \text{DN } 50$
- Shut-off valves and possibility of sampling upstream and downstream of the product

### Electrical installation

- Schuko socket (type F, CEE 7/3) with continuous power supply (max. 3.0 m from the control unit).
- The socket must not be coupled with light switches, emergency heating switches or the like.






## Accessories

Availability may vary depending on the country.

	varioliQ:LB3000	varioliQ:LB4500
 <p><b>Water sample cooler for hot water 40 bar</b> Order no.: <b>160460</b> Stainless steel water sample cooler for cooling hot water samples</p>	✓	✓




Consumables

	varioliQ:LB3000	varioliQ:LB4500
 <p><b>GENO-SW 2010 container: 20 kg</b> Order no.: <b>180415</b> Alkaline liquid phosphate product for residual hardness precipitation and alkalisation in hot water circuits and steam generation systems.</p>	✔	✔
 <p><b>Comb. measuring device pH and conductivity incl. accessories</b> Order no.: <b>170000010000</b> for analysing heating water, cooling water and swimming pool water</p>	✔	✔
 <p><b>Neutralising agent FNK, 20 kg</b> Order no.: <b>180300</b> Diluted alkaline solution for reducing carbonic acid and the pH value for technical purposes.</p>	✔	✔
 <p><b>Regeneration salt 25 kg sack</b> Order no.: <b>127001</b> Regeneration salt in tablet form according to EN 973 type A for the regeneration of ion exchangers.</p>	✔	✔
 <p><b>Water test kit for total hardness type B, 100 determinations</b> Order no.: <b>170149</b></p>	✔	✔

Recommended products

Availability may vary depending on the country.

	varioliQ:LB3000	varioliQ:LB4500
 <p><b>Analysis case for pH value+conductivity, total hardness</b> Order no.: <b>707192</b> Metal case for determining the heating water or boiler water parameters.</p>	✔	✔



## Options

Availability may vary depending on the country.

	varioliQ:LB3000	varioliQ:LB4500
<b>Dosing system pH value increase installed in varioliQ</b> Order no.: <b>707000150000</b> Dosing system for varioliQ to increase the pH value to the desired value	✓	✓
<b>Automatic make-up water feed optional module to varioliQ:LB</b> Order no.: <b>707000170000</b> Module for the automatic make-up water feed with integrated leakage monitoring.	✓	✓
<b>pH value measurement and documentation for varioliQ</b> Order no.: <b>707000160000</b> pH value measurement with measuring transducer for documentation built into varioliQ	✓	✓
<b>First filtrate flushing device for varioliQ</b> Order no.: <b>707000180000</b> for inserting into circuits with low-salt operation to avoid salination in the circuit	✓	✓

