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# Технические характеристики на системы очистки воды, аксессуары CCS, AQUAboss компании **B. BRAUN**

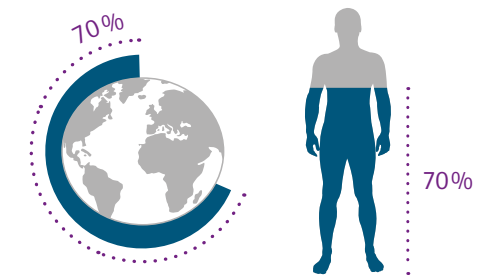
**Виды товаров:** устройства обратного осмоса, дезинфекторы, проточные нагреватели для термического обеззараживания систем водоподготовки, устройства раздачи жидких концентратов кислотного гемодиализа, системы термической дезинфекции, центры медиаобеспечения и др.



# THE ESSENCE OF LIFE

THE COMMON DENOMINATOR OF ALL LIVING THINGS

H<sub>2</sub>O – a simple chemical formula with profound significance. A compound uniquely intertwined with our understanding of life, purity, and vitality, it is the prerequisite for and the common denominator to all life on Earth. Water covers some 70% of the Earth's surface, and almost the same percentage can be found in every single one of us.



## WHY IS PURE WATER SO IMPORTANT FOR DIALYSIS?

During hemodialysis treatment, patients are exposed to large quantities of dialysis fluid, which is 99.3% water, separated from the patient's blood solely by a very thin, semi-permeable dialyzer membrane. Clinical studies have revealed that contaminants in dialysis water are contributory factors for both acute and chronic morbidity and are responsible for serious complications in hemodialysis patients.<sup>1</sup> Consequently, water quality is a key factor in modern dialysis.

Because it's so crucial to your patients' health and wellbeing, there's just no substitute for the highest possible level of water purity for dialysis treatment. At B. Braun, we can look back at over 25 years of experience in dialysis water purification and have evolved over the years into a world leader in this field. Our new AQUAbase reverse osmosis purification unit was designed with the same philosophy of quality, customer value and safety that goes into everything we manufacture.

<sup>1</sup> Cannata-Andia JB, Fernández-Martín JL. The clinical impact of aluminium overload in renal failure. *Nephrol Dial Transplant* 17 [Suppl 2]: 9-12, 2002 | Usuda K, Kono K, Yoshida, Y. The effect of hemodialysis upon serum levels of fluoride. *Nephron* 75:175-178, 1997 | Calderaro RV, Heller L. Outbreak of hemolytic reactions associated with chlorine and chloramine residuals in hemodialysis water. *Rev Saude Publica* 35:481-486, 2001 | Yamagami S, Adachi T, Sugimura T, Wada S, Kishimoto T, Maekawa M, Yoshimura R, Niwa M, Terano Y, Shalton S. Detection of endotoxin antibody in long-term dialysis patients. *Int J Artif Organs* 13:205-210, 1990



# AQUAboss

## DISCOVER THE POSSIBILITIES

AQUAboss RO devices are manufactured to the highest quality using stainless steel. For you, this means enhanced reliability and durability. Thanks to their innovative technology, AQUAboss RO devices reduce water consumption during daily operation and standby periods. This helps reduce costs over the complete system lifetime.

### WATER PURIFICATION AT THE HIGHEST LEVEL

- Available as single- or double-stage reverse osmosis device
- Double stage device performs as a fully redundant system
- Dead-space-free design concept for the entire installation (AQUAstream)
- High water recovery rates up to 85% (geared-to-consumption)
- Impulse backwashing for cleaner and long-lasting membrane modules
- Durable stainless steel design
- Complete heat-on-demand disinfection (Hot Rinse Smart)



# PREMIUM WATER PURIFICATION

A CLEAN SOLUTION FOR MORE HEALTH

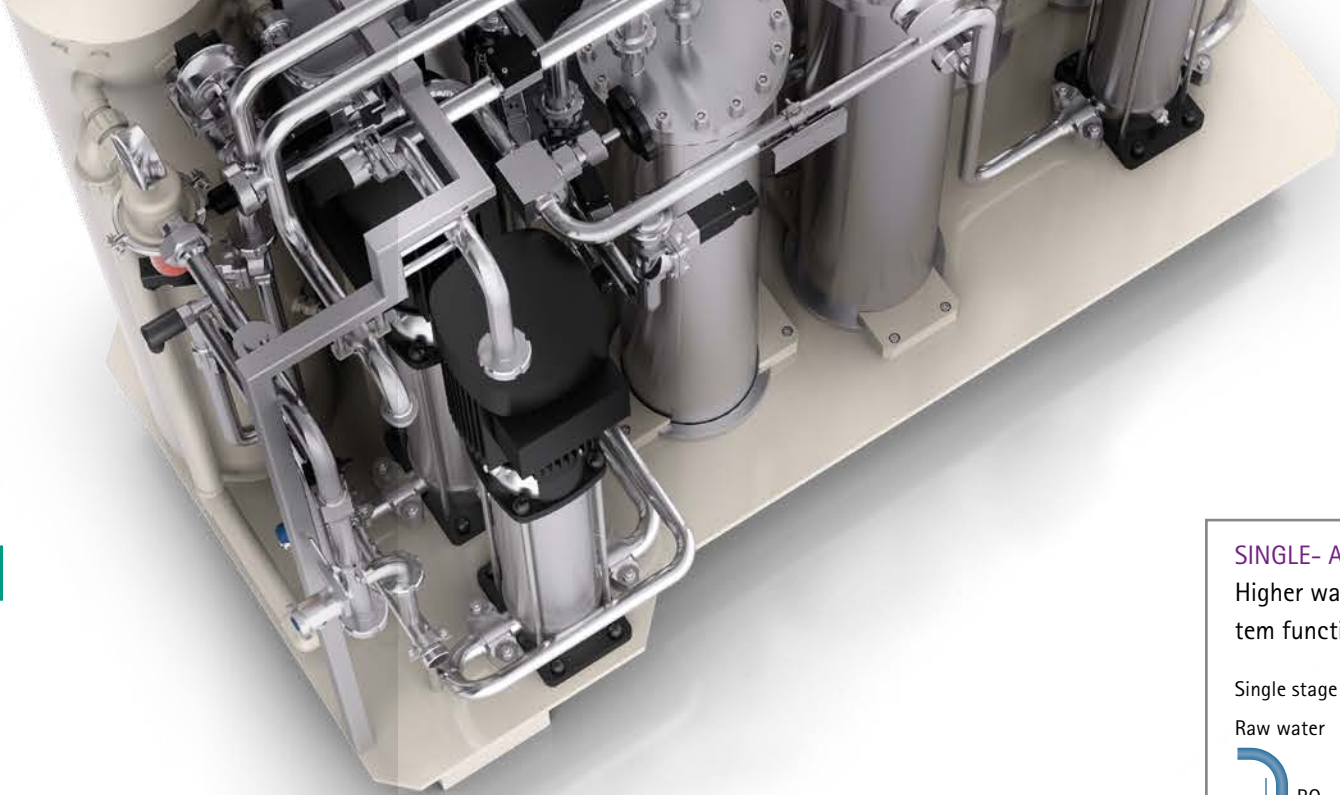
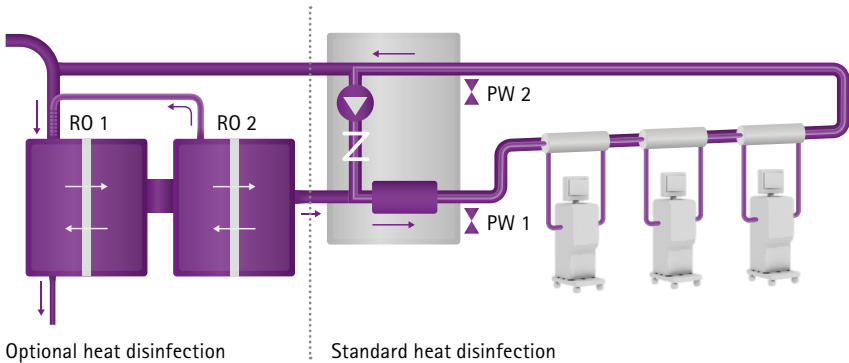
Research has shown that water quality is crucial to the health and wellbeing of dialysis patients. That's why we made every effort to ensure that the AQUAboss gives you just that: pure water.

The design of the AQUAboss eliminates all dead space within the piping and membrane housing, while an advanced impulse backwashing system inhibits biofilm deposition. In addition, AQUAboss features a highly effective heat disinfection system. Taken together, these state-of-the-art design elements improve the highest level of safety and quality for your patients.

Heat disinfection itself is nowadays often seen as an integral part of modern dialysis systems. However, heat disinfection should cover the whole water treatment system, including the distribution system to the dialysis machine and the RO device. AQUAboss RO single stage and double stage devices use the latest technological developments to also perform heat disinfection on the RO device, including all elements and parts of the system, from the break tank up to the point of use.

### HOT RINSE SMART

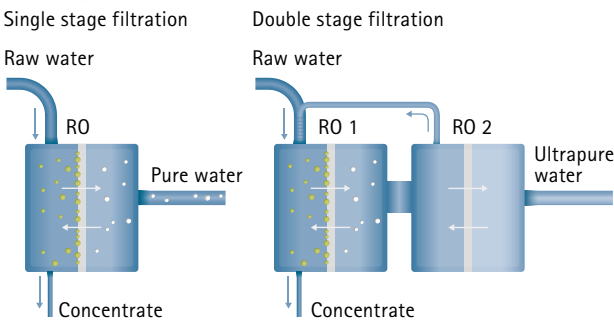
Total heat disinfection (option) using heat-on-demand flow-through heater. No tank with stagnant water. Opportunity to operate chemical-free.



## AQUAboss DETAIL HIGHLIGHTS

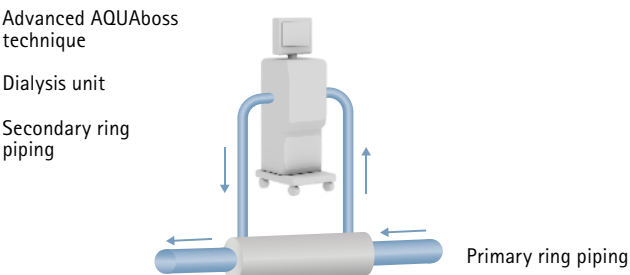
### SINGLE- AND DOUBLE-STAGE FILTRATION

Higher water quality and efficiency plus fully redundant system functionality

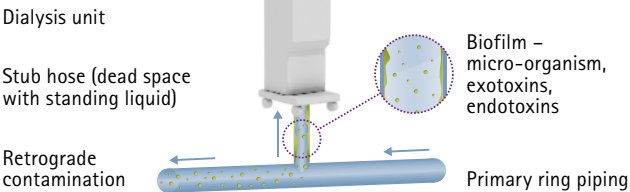


### AQUAstream CONCEPT

Dead-space-free design for the entire ring main installation. Constant flow to dialysis machines using secondary ring piping technology.

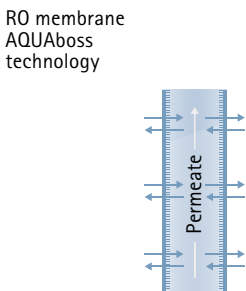


### Conventional technique

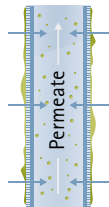


### IMPULSE BACK-WASHING (ECO)

Clean, long-lasting membranes thanks to automated flushing technology

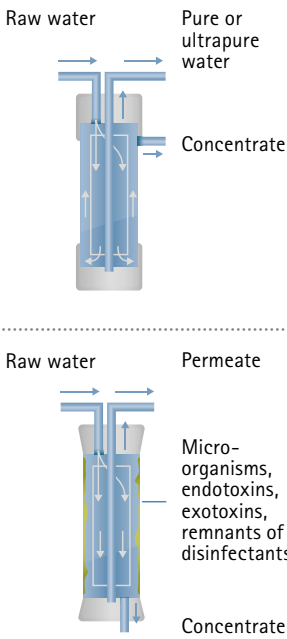


### RO membrane conventional technology



### DEAD-SPACE-FREE

Dead-space-free system design concept including membrane housing





# SPOT ON SUSTAINABILITY

AN ECONOMICAL AND ENVIRONMENTALLY SOUND CHOICE

In addition to achieving the best possible treatment outcomes, healthcare systems all over the world are under pressure to control costs and improve efficiency. Depending on the system configuration, investment costs for water treatment systems make up only about one quarter of the total lifecycle costs.

That's why it's so important to strive for reliable, innovative and flexible solutions to reduce the total lifecycle costs and ensure cost-effective dialysis.

AQUAsystem technologies are designed to consume only the minimum amount of valuable fresh water and electricity during dialysis and standby operation.



### TOTAL COSTS OF OWNERSHIP

Water costs	24%
Energy costs	25%
Service and maintenance	24%
Capital costs for RO and heat disinfection system	27%



It's geared-to-consumption principle and its on-demand thermal technology contribute to the system's efficiency. With the AQUAsystem, you can save more than 40% on water consumption alone as compared to conventional water purification systems.

Automated impulse backwashing cleaning and heat disinfection functions maintain consistently high system performance levels. We also offer steam sterilization (AQUAclav) for stainless steel distribution systems. This gives you a water purification system that complies with pharmaceutical industry standards.

The easy to use and long-lasting technology "made in Germany" will provide you with many years of reliable service with a reduced amount of maintenance. Nevertheless, our global service network is there for you whenever the need should arise.



AQUAboss PACKAGES

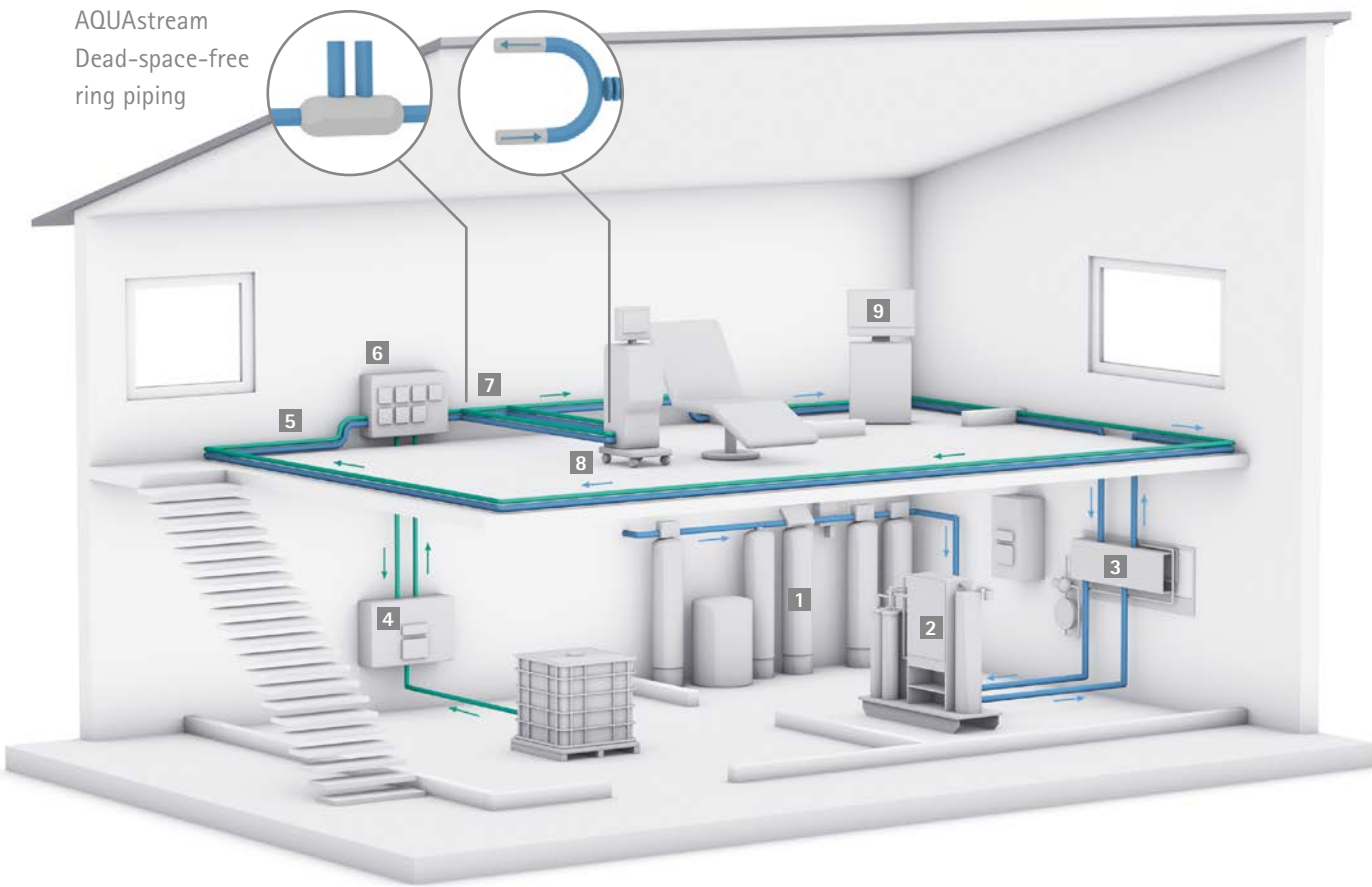
AQUAboss	AQUAboss Classic	AQUAboss Comfort	AQUAboss Premium
	Standard Package	Advanced Package	Full Package
Pretreatment equipment	Pending on raw water conditions	Pending on raw water conditions	Pending on raw water conditions
RO device series	<ul style="list-style-type: none"><li>AQUAboss single stage</li></ul>	<ul style="list-style-type: none"><li>AQUAboss single- or double-stage</li><li>Impulse backwashing (eco)</li></ul>	<ul style="list-style-type: none"><li>AQUAboss double stage</li><li>Impulse backwashing (eco)</li></ul>
Disinfection (other than chemical)	-	<ul style="list-style-type: none"><li>Hot Rinse Smart Ring Disinfection</li></ul>	<ul style="list-style-type: none"><li>Hot Rinse Smart Ring Disinfection</li><li>Hot Rinse Smart RO Disinfection</li><li>Premium PLUS: AQUAclav</li></ul>
Ring main supply	<ul style="list-style-type: none"><li>PEX</li><li>AQUAstream</li></ul>	<ul style="list-style-type: none"><li>PEX</li><li>AQUAstream</li></ul>	<ul style="list-style-type: none"><li>Stainless steel</li><li>AQUAstream</li></ul>
Process visualization	-	<ul style="list-style-type: none"><li>AQUAvision</li></ul>	<ul style="list-style-type: none"><li>AQUAvision</li></ul>
Media supply center	Wide range of supply centers available	Wide range of supply centers available	Wide range of supply centers available

ALL PACKAGE COMPONENTS CAN BE COMBINED INDIVIDUALLY.



IN A PERFECT FLOW

AQUAsystem – A COMPREHENSIVE SOLUTION FOR DIALYSIS WATER TREATMENT



- 1

Pretreatment
- 2

AQUAboss/AQUAbase reverse osmosis device
- 3

Heat disinfection solutions
- 4

Central concentrate supply
- 5

Ring piping solutions
- 6

Media providing centers
- 7

Pressure differential bulb
- 8

Secondary ring piping
- 9

Process visualization

Perfection is when everything fits together flawlessly. With the AQUAsystem, B. Braun Avitum strives to offer the best possible system solution by always focusing on the customer's key needs: increasing the quality of life of the patient and reducing the total cost of ownership.

This complete system can handle even the most demanding requirements. With its dead-space-free, closed circuit system, intuitive process visualization and monitoring software, it's much more than just the sum of its parts.

Together with the AQUAsystem, we offer comprehensive planning and maintenance services, as well as individually tailored service models from a single source. As always, you can rely on our years of experience in the field of dialysis, certified production processes and quality "made in Germany".

AQUAboss PACKAGES

AQUAboss	AQUAboss Classic	AQUAboss Comfort	AQUAboss Premium
	Standard Package	Advanced Package	Full Package
Pretreatment equipment	Pending on raw water conditions	Pending on raw water conditions	Pending on raw water conditions
RO device series	<ul style="list-style-type: none"><li>AQUAboss single stage</li></ul>	<ul style="list-style-type: none"><li>AQUAboss single- or double-stage</li><li>Impulse backwashing (eco)</li></ul>	<ul style="list-style-type: none"><li>AQUAboss double stage</li><li>Impulse backwashing (eco)</li></ul>
Disinfection (other than chemical)	-	<ul style="list-style-type: none"><li>Hot Rinse Smart Ring Disinfection</li></ul>	<ul style="list-style-type: none"><li>Hot Rinse Smart Ring Disinfection</li><li>Hot Rinse Smart RO Disinfection</li><li>Premium PLUS: AQUAclav</li></ul>
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Process visualization	-	<ul style="list-style-type: none"><li>AQUAvision</li></ul>	<ul style="list-style-type: none"><li>AQUAvision</li></ul>
Media supply center	Wide range of supply centers available	Wide range of supply centers available	Wide range of supply centers available

ALL PACKAGE COMPONENTS CAN BE COMBINED INDIVIDUALLY.



AQUAsystem REVERSE OSMOSIS DEVICE SERIES

Liters/hour	200	750	1700	2650	3600
AQUAbase	250-900 l/h				
AQUAboss single stage	500-3000 l/h				
AQUAboss double stage	500-3600 l/h				
Machine supply	6	25	55	85	120





# AQUAsystem – OVERVIEW

## AQUAbase

The AQUAbase is our basic, single stage water treatment system.

## AQUAboss

AQUAboss offers the choice of single- or double-stage water treatment systems, our premium device series.

## AQUAstream

This system offers highly hygienic, dead-space-free ring piping solutions. The unique design concept ensures constant flow to the dialysis machine connection and incorporates unique welding technology for its stainless steel tubing.

## AQUAsupport

We offer customized service and support packages for planning, construction, training, service and maintenance.

## AQUAvision

AQUAvision is our specially developed, network-capable process visualization and monitoring software. This intuitive user interface is designed to simplify operation, documentation and error analysis.

## AQUAclav

With our steam sterilization services for stainless steel distribution systems, your water purification system complies with pharmaceutical industry standards.

# AQUAsystem – CHARACTERISTICS

- Over 25 years of experience in dialysis water purification
- Medical device standard
- Durable stainless steel design
- Redundant double stage technology
- Global service and support network
- Expert pre- and post-sale consulting

## SAVINGS

- High water recovery rates
- Geared-to-consumption during operation and standby
- Efficient cleaning and disinfection technologies
- Heat-on-demand
- Chemical-free disinfection solutions
- Easy service

## WATER QUALITY

- Constant flow throughout the entire water treatment system
- Double stage filtration technology
- Automated membrane flushing feature (impulse backwashing)
- PLUS: AQUAclav sterilization services for water purification systems to pharmaceutical standards



# AQUAbase® nX

## Essential water purification



The AQUAbase® nX series was developed to offer the essentials of dialysis water purification without compromising on quality or reliability. Combining stainless steel piping construction, highly efficient water consumption and the option of constructing with fully automated heat disinfection the AQUAbase® nX series represents an economical solution.

### A reasonable investment

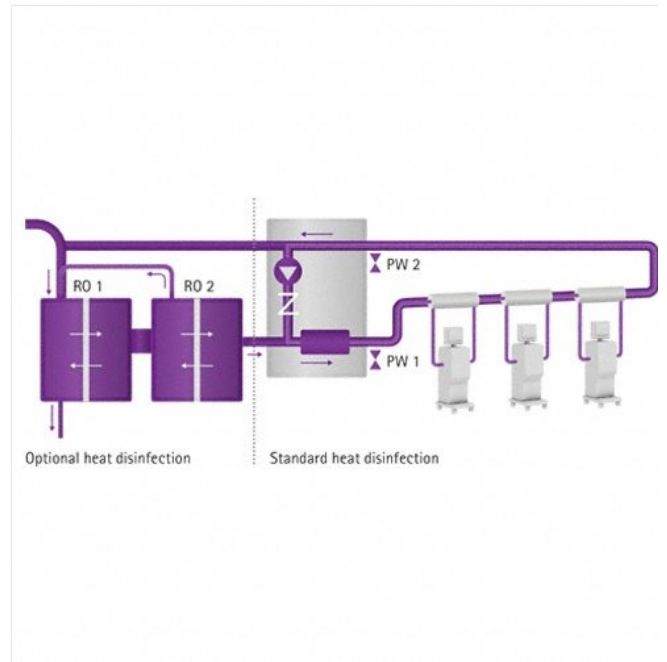
- Available as a single stage reverse osmosis device
- Improved usability by 7" touchscreen display
- Medical device standard (Medical Device Directive 93/42/EEC and other guidelines)
- High water recovery rates of up to 75 % (geared to consumption)
- Durable stainless steel design
- Small footprint
- Heat disinfected by integrated flow through heater (option)

# AQUAboss® Hot Rinse Smart 10-50

## Flow-through heater for heat disinfection of water treatment systems



Hot Rinse Smart 50



Hot Rinse



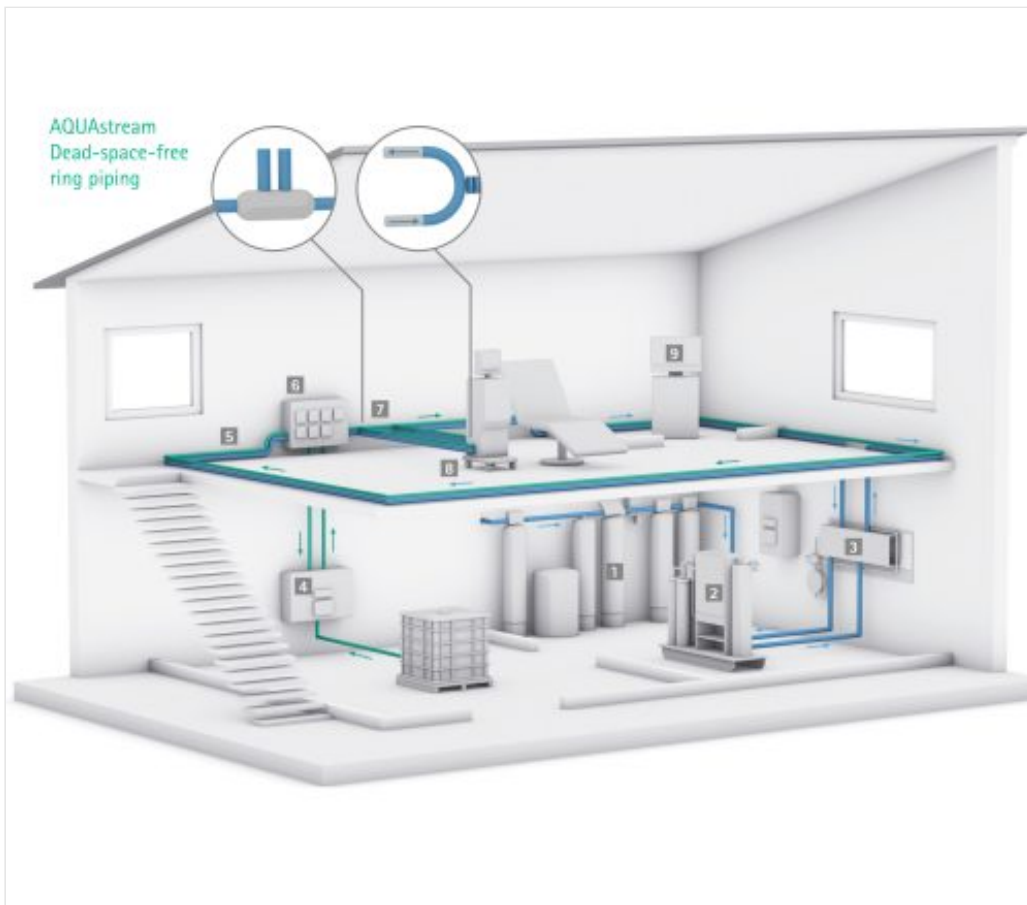
Worldwide, a trend toward total heat disinfection of entire water treatment systems can be observed.

The AQUAboss Hot Rinse Smart accomplishes this using well-established flow-through heater technology.

The high-performance device allows a complete, dead-space-free flow of hot water to permeate the entire loop and reverse osmosis system (optional). Making it especially efficient, hot water is only produced if requested for the heating cycle. The complex and costly maintenance of a conventional hot water reservoir is no longer necessary – a significant contribution to reducing the total cost of ownership over the system's lifetime.

For a full end-to-end heat disinfection approach, Dialog+ hemodialysis machines can be integrated into the central heat disinfection cycle.

# AQUAstream CONCEPT



Ring main supply

Lauer water purification systems follow a unique design philosophy. To ensure high permeate quality, continuous flow in the entire water treatment system is absolutely crucial.

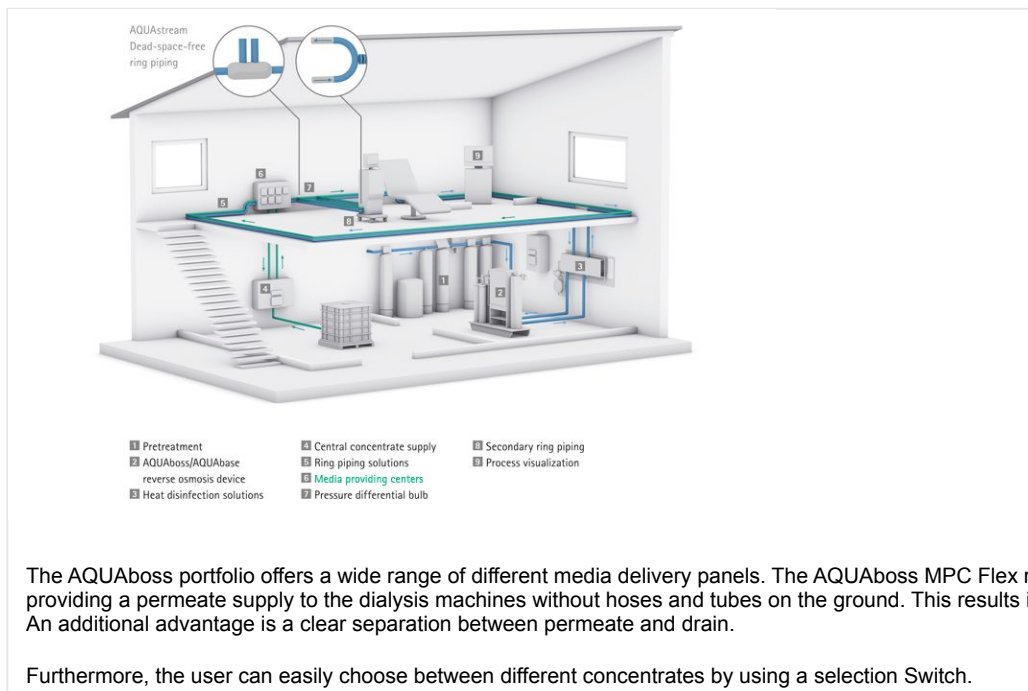
The AQUAstream design concept avoids stagnant permeate (dead spaces) and prevents microbiological contamination where it originates. This is the foundation for reliable day-to-day operation, ensuring high quality outcomes while reducing the need for time-consuming cleaning and disinfection. The thermal based disinfection system eliminates the need for chemical additives, making it safe for patients and easy on the environment. Together with its highly economical reverse osmosis technology that conserves both water and electricity, the AQUAstream reduces operative costs substantially over the complete system lifetime. As full system provider for hemodialysis applications, B. Braun Avitum brings together the technologies and know-how needed to provide uncompromising and individualized products and services to customers around the world.



# AQUAboss® Media Providing Center

## Media providing centers for an increased hygiene of renal care units

## Media providing centers for an increased hygiene of renal care units

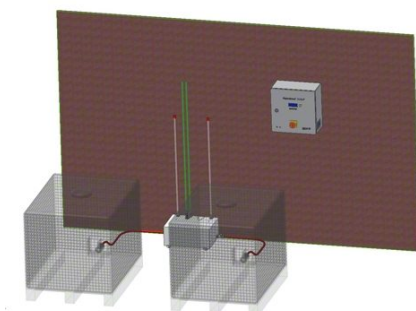


## CCS

## Central Concentrate Supply

Set up plan  
CCS

The intended use is the pumping and distribution of liquid acid hemodialysis concentrates.



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