

Your partner for water technology



Festo Oy
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Koulutuspäällikkö

Who are we? And what can we offer you?



- **The Festo company**
- **Products, solutions and services for water technology**

**Our
expertise**

**Your
advantage**

Festo – your partner for long-term success



● **Intelligent automation**

- Factory automation
- Process automation
- Didactic = Training Systems & Training
- Products
- Services
- Training

Water Technology - What Festo has to offer?

Electric components

Factory automation

Engineering tools

Online shop

IP69K



Clean design

Safety

Process automation

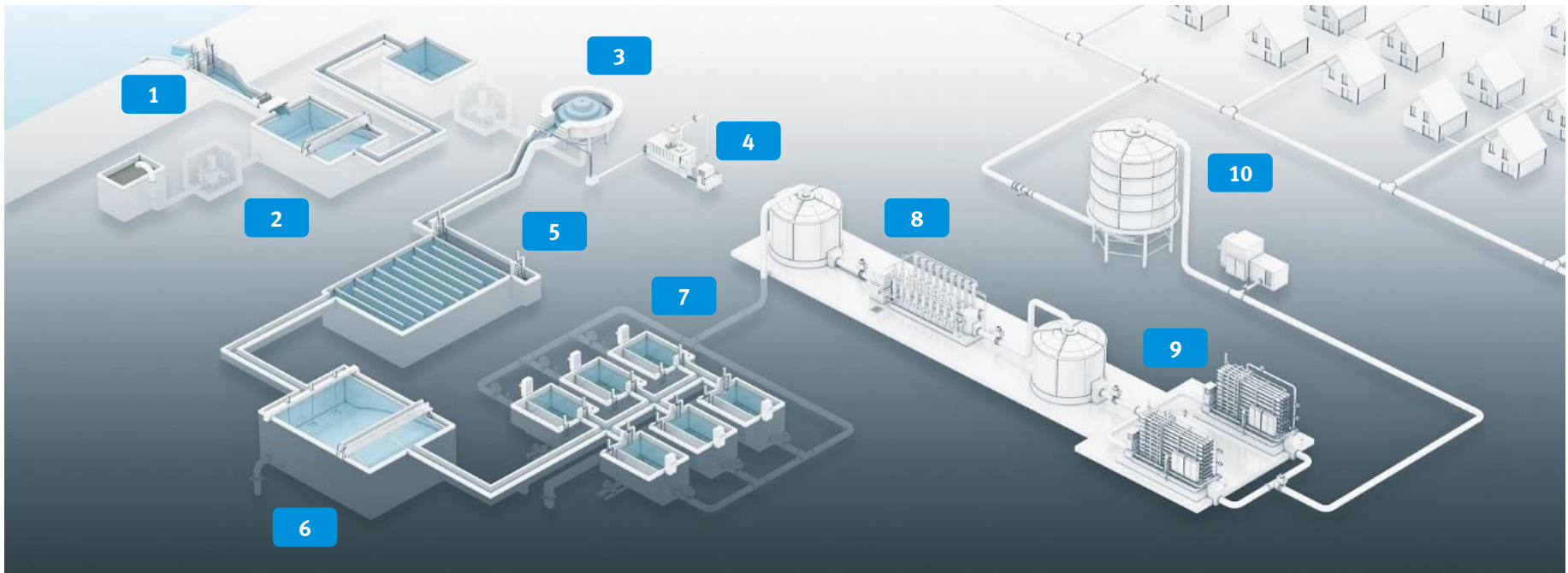
Energy efficiency

Pneumatic components

Corrosion resistance

We support you in the field of municipal water treatment

Exit

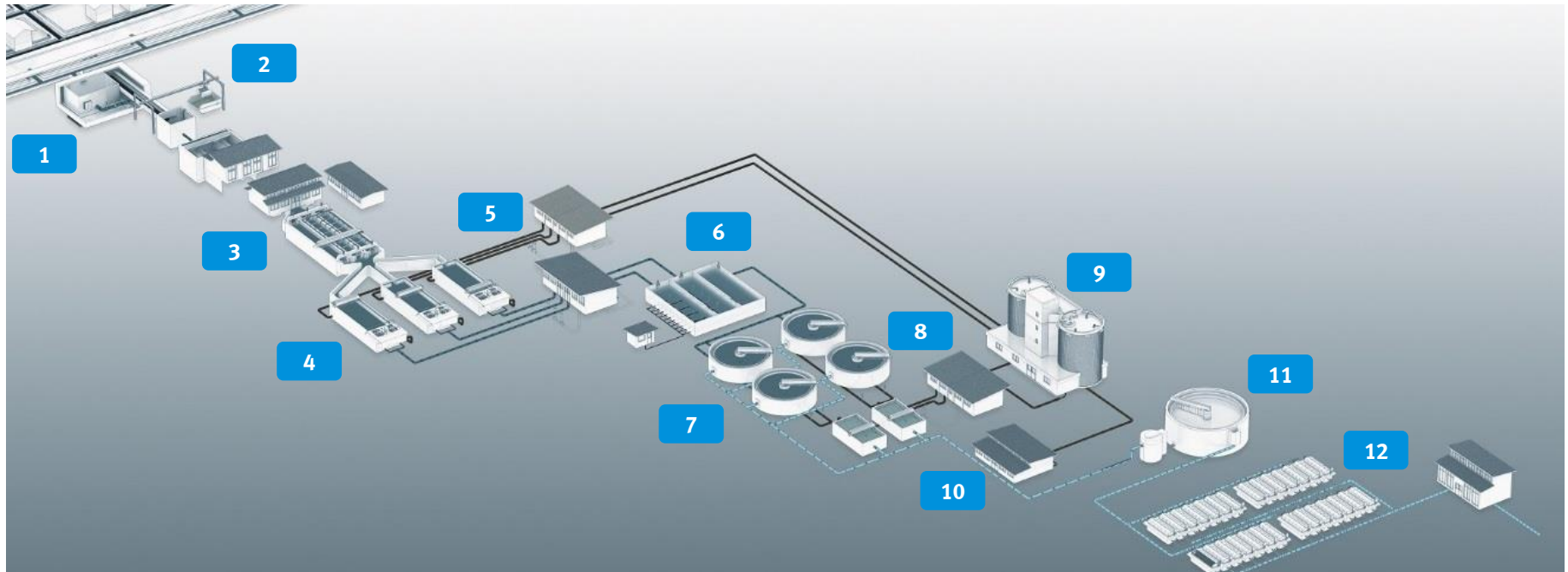


1 Inlet	2 Sludge pumping station	3 Raw water pumping station
4 Mixing/dosing	5 Coagulation-flocculation	6 Sedimentation tank
7 Fixed-bed filtration	8 Ultrafiltration	9 Reverse osmosis
10 Distribution		

Next >>>

Exit

We support you in the field of municipal wastewater treatment

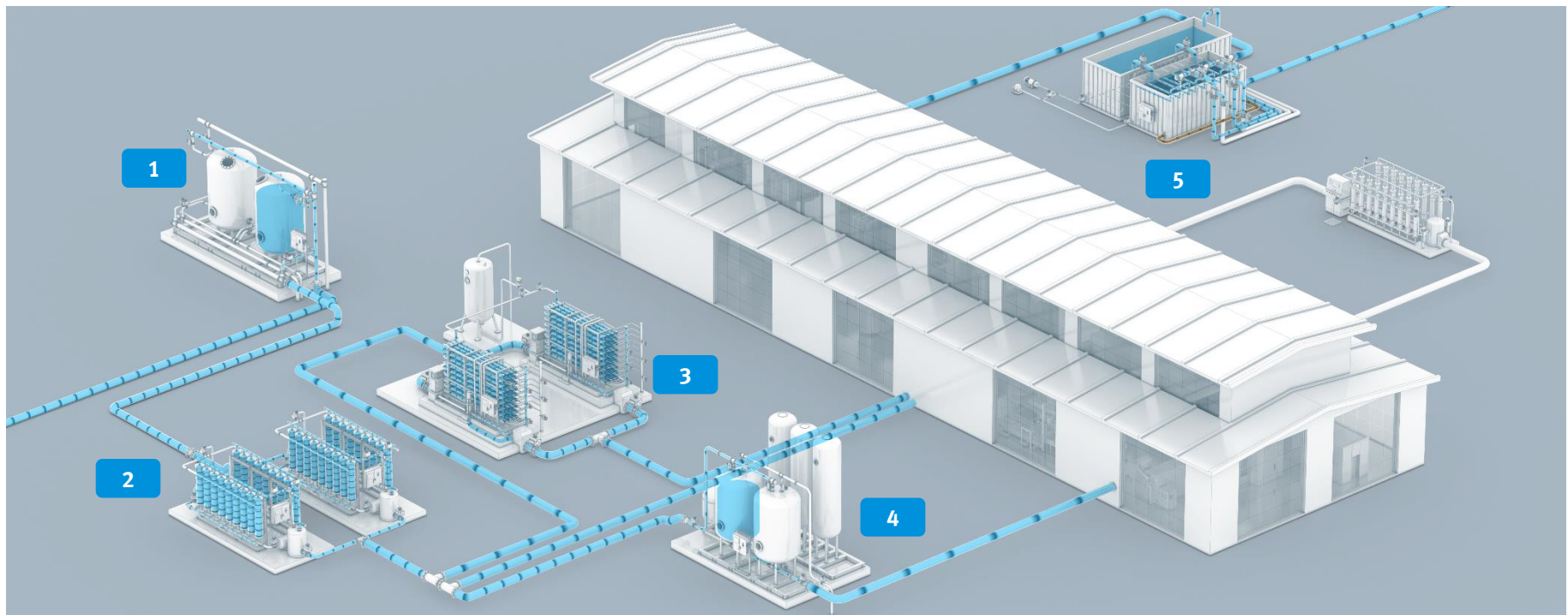


1 Rainwater overflow basin	2 Grit trap	3 Sand/grease trap
4 Primary sedimentation tank	5 Wastewater pumping station	6 Aeration tank
7 Secondary sedimentation tank	8 Sludge pumping station	9 Digestion tower
10 Sludge dewatering	11 Activated carbon treatment	12 Micro-strainer/sand filter

Next >>>

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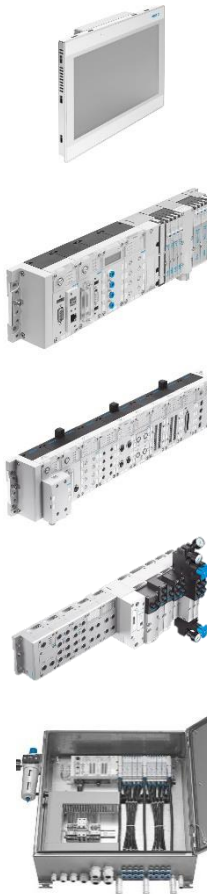
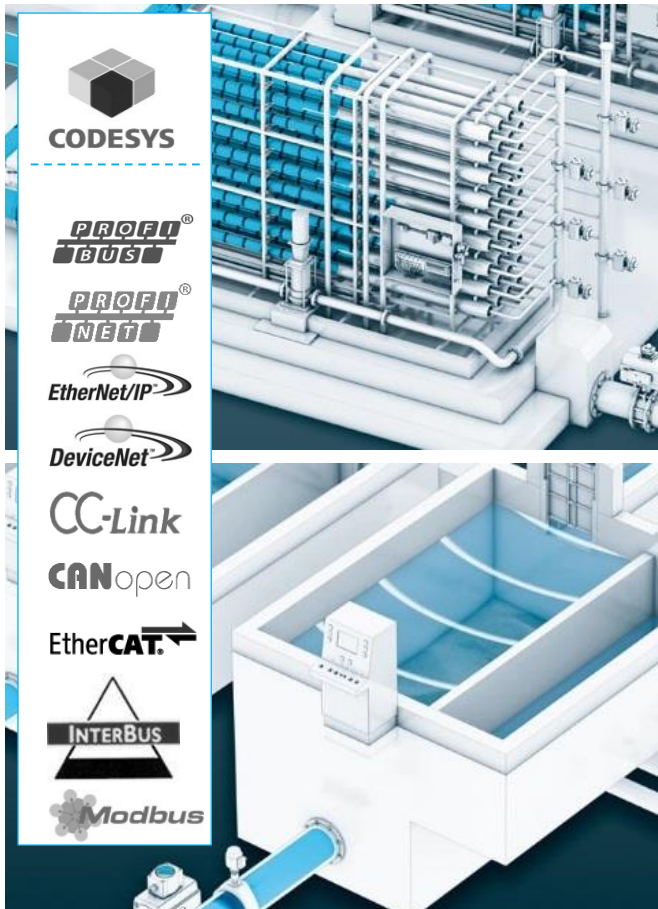
We support you in the field of industrial water treatment



- | | | |
|---------------------------|---|--------------------------|
| 1 Fixed-bed filter | 2 Micro-, ultra- and nano-filtration | 3 Reverse osmosis |
| 4 Ion exchanger | 5 Membrane bioreactor | |

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Examples of products for water technology – operating and control levels



Front-end display CDPX (touch)

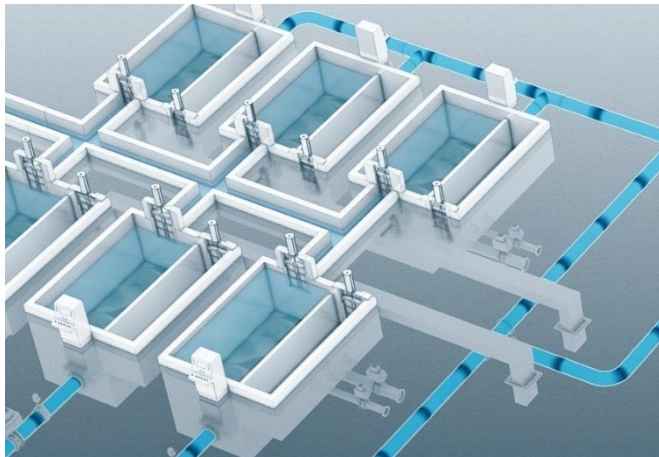
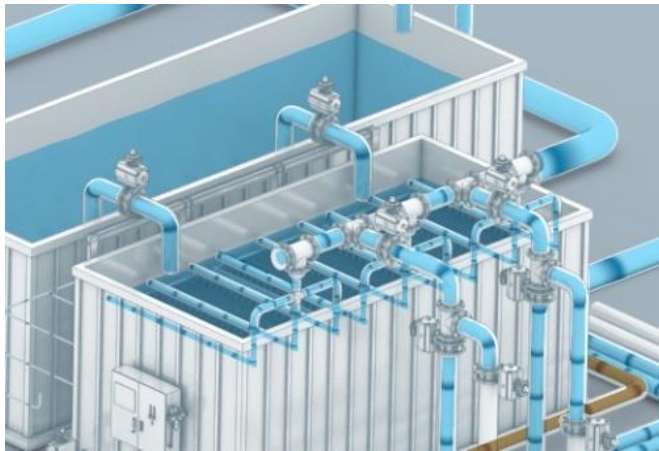
Integrated controller, e.g. CPX-CEC

Automation platform CPX

Valve terminal CPX/VTSA

Control cabinets

Examples of products for water technology – process level (1/2)



Positioner CMSX



Sensor box SRBC



Solenoid valve VSNC

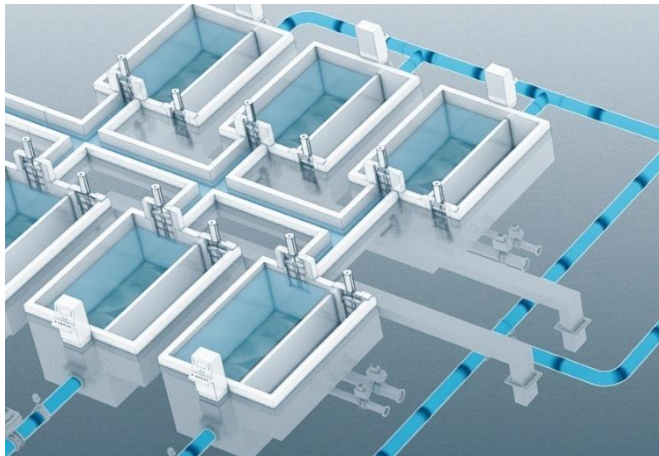
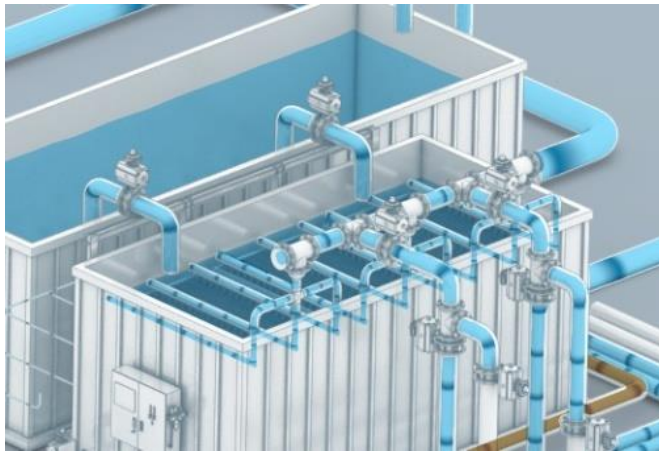


Linear actuators DFPI, DLP



Quarter turn actuators DFPB/DAPS

Examples of products for water technology – process level (2/2)



Service units, tubing and connection technology



Pre-assembled process valve units

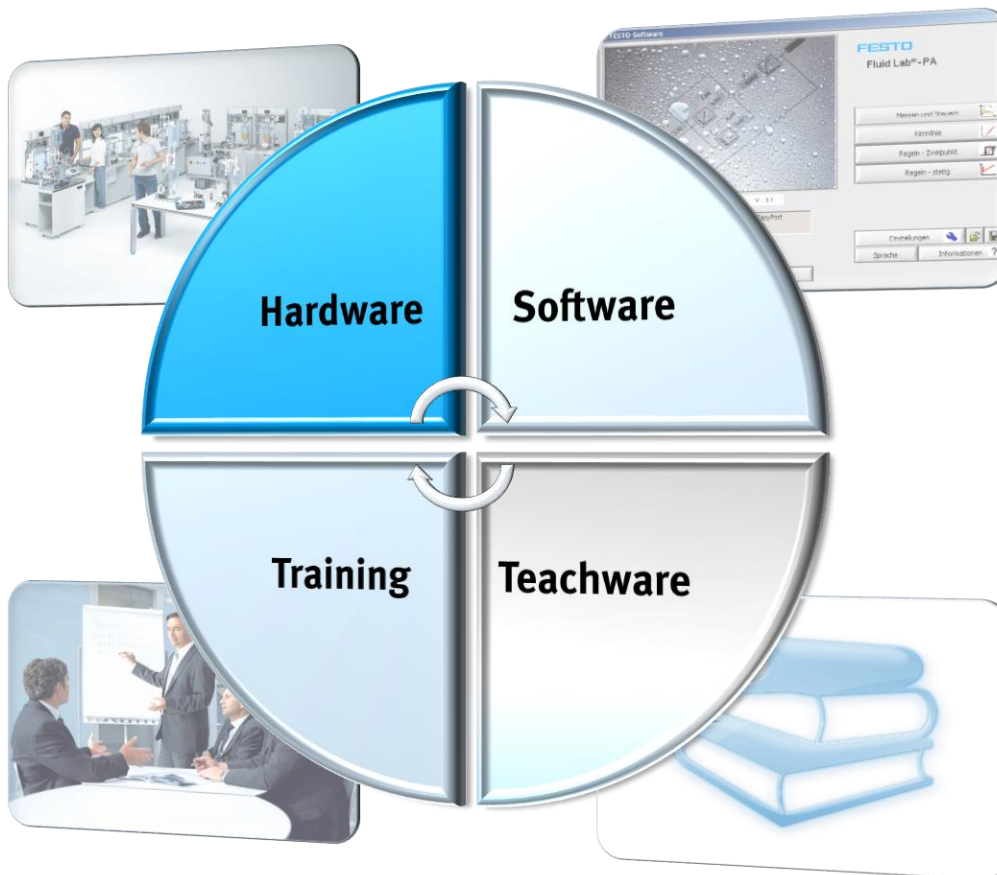
Oppimisympäristöt



Environmental
Discovery
System
Water Management

Festo Didaktikka toimittaa kokonaisen oppimisympäristön

Modulaarinen
teollisuusprosessien
harjoittelulaitteisto



Ohjelmisto
järjestelmän
seurantaan,
ohjaukseen ja
tulosten arviointiin

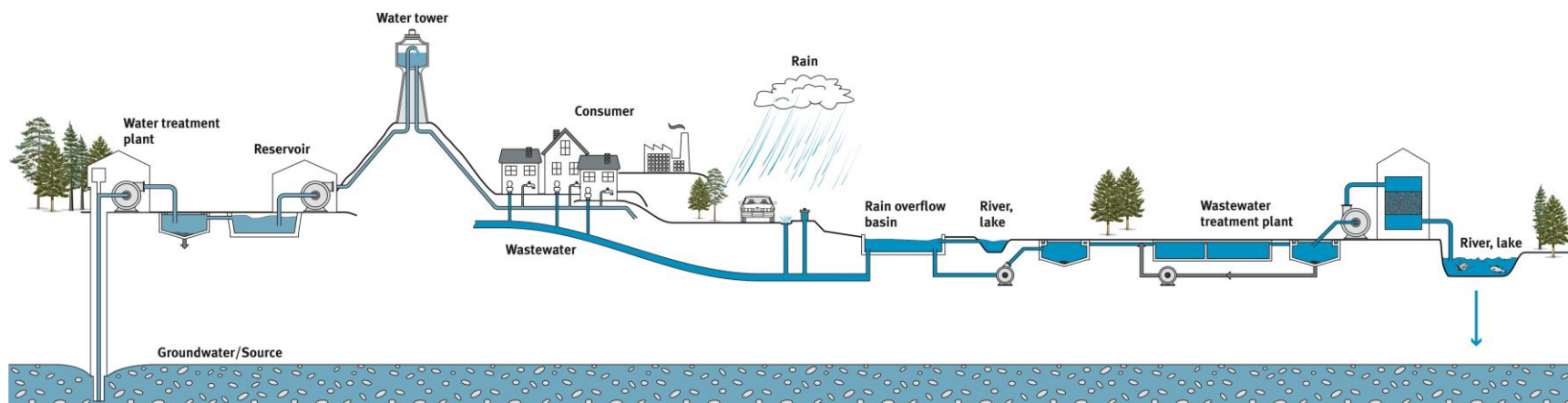
Käyttäjäkoulutus
ja laitteiston
ylläpito

Harjoitusmateriaali
opettajalle ja
oppilaille

Core Competencies based on the German curricula:



The EDS[®] – Environmental Discovery System for Water Management

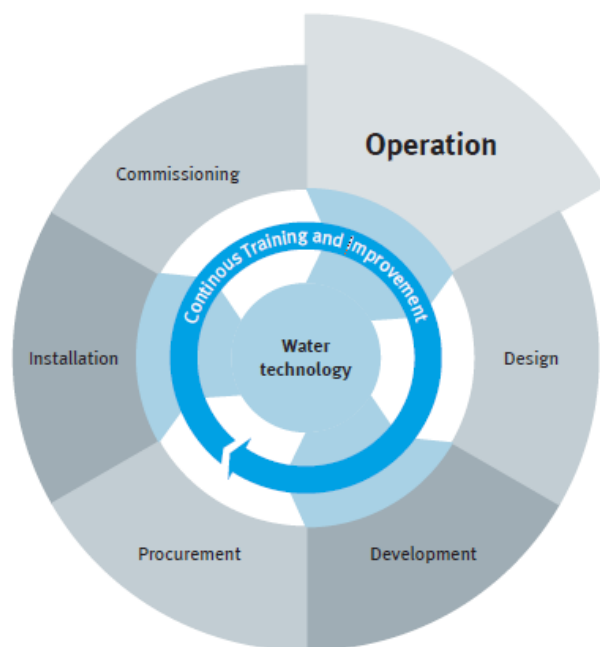


The EDS[®] – Water Management

simuloi ja mallintaa pääprosessit veden ja jäteveden käsittelyyn.

Järjestelmän avulla voidaan kouluttaa käytännön läheisesti kuinka vesi ja jätevesi kerätään, kuljetetaan ja käsitellään.

EDS[®] – Water Management koulutusjärjestelmän edut



Järjestelmä

- on modulaarinen ja joustava eri opetustilanteisiin
- on suunniteltu teollisten standardien mukaan
- simuloi veden tuotannon ja jäteveden käsittelyn pääprosessit
- perehdyttää opiskelijat myös prosessiautomaatioon ja säätötekniikkaan
- mahdollistaa käytännön harjoitusten ja kokeiden suorittamisen
- vastaa ja mallintaa toiminnaltaan ja suunnittelultaan todellisia teollisia laitteistoja ja prosesseja

6 opetusmodulia, opetustavoitteet (1/3)

Module 1:

Veden puhdistus



The trainee is able to

- handle the basic processes of precipitation, flocculation and sedimentation
- deal with chlorine dosage and measurement of free chlorine concentration
- name problems with too high or too low chlorine dosage

Module 2:

Veden toimittaminen, pumppaaminen



The trainee is able to

- name the characteristics of different pump types and operate the pumps
- understand the influences on pump performance during water supply
- work with the relationship between pressure and volume flow rate in a piping system
- control water supply by different valve types
- control the fill level of a high tower while simultaneously water is withdrawn
- describe the significance of pressure zones in a water distribution area
- identify water loss and name the basic problems involved in detecting leaks in water distribution networks

6 opetusmodulia, opetustavoitteet (2/3)

Module 3:

Jäteveden kuljetus



The trainee is able to

- handle the transport of solids in sewers with varying flow rates in a combined sewage sewer
- name the effects of exceeding the hydraulic capacity
- deal with the sedimentation and the impact of a blockage in a sewer
- name the basic mechanisms that lead to a first flush
- describe the role of a rain overflow basin and his components
- line out the basic mode of operation of a through-flow basin with regard to retention of solids

Module 4:

Jäteveden käsittely ja puhdistus



The trainee is able to

- simulate and explain basic processes related to the sedimentation of sludge
- analyse the behaviour of flocs under different flow rates and solids load
- name the consequences of hydraulic overload of a wastewater treatment plant
- describe the basic function of aerobic water purification and the role of sludge recirculation
- describe the significance of oxygen injection into the activation tank
- measure the amount of dissolved oxygen and explain the benefits of constant measuring

6 opetusmodulia, opetustavoitteet (3/3)

Module 5:

Järjestelmän ohjaus,
monitorointi ja optimointi



The trainee is able to

- differentiate between linear and non linear system characteristics
- control the fill level using a two-step controller and a continuous controller
- control the flow using a proportional-integral controller
- describe the characteristics of different controllers and their relevant settings
- explore the impacts of controller settings on energy consumption
- adjust the volumetric flow by using different controller settings for the proportional media valve
- evaluate the best control strategy for the aeration process

Module 6:

Laitoksen energiakulutuksen
seuraaminen ja energiatehokkuus

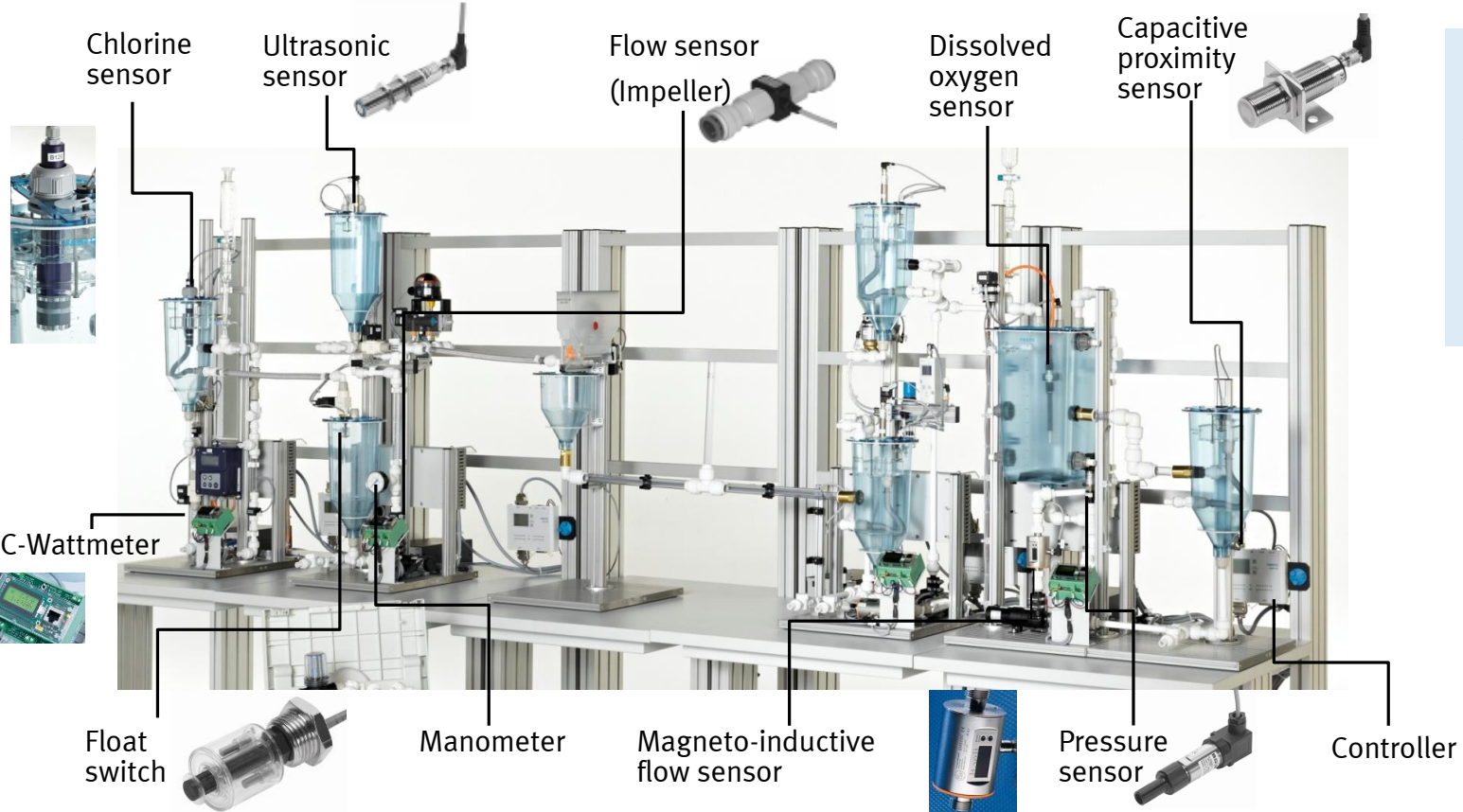


The trainee is able to

- identify the difference in energy consumption between the free and the narrowed piping system
- find out potentials for energy saving and energy conversion in water- and wastewater treatment processes
- measure energy consumption and calculate efficiency of pumps and valves
- compare different control strategies regarding their energy demand to optimise efficiency
- estimate and calculate costs of different controller strategies
- describe the structure and methods of energy management

Anturit ohjaukseen ja monitorointiin

Typical water-related process variables, such as fill level, flow and pressure are constantly measured.



Pumput ja venttiilit toimilaitteiden opetukseen



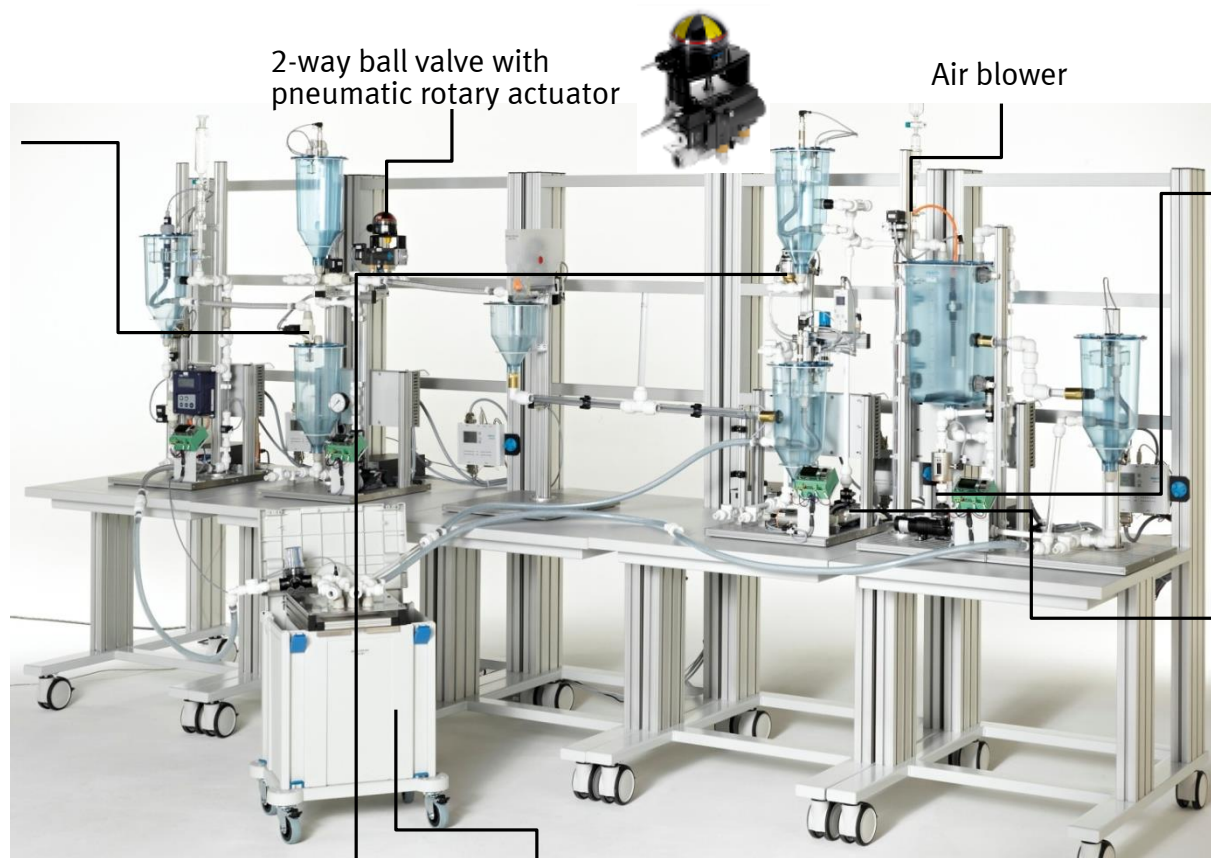
2-way ball valve with pneumatic rotary actuator

Air blower

Recirculating Pump



Proportional media valve



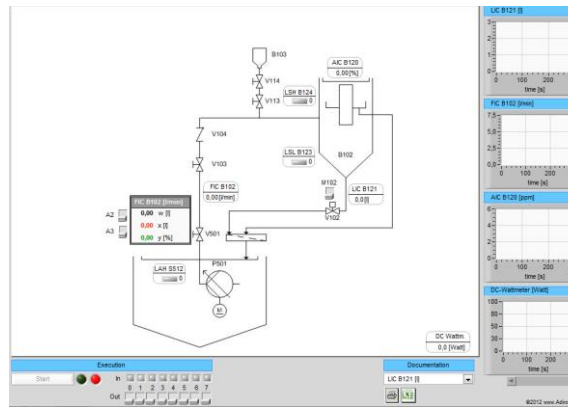
Gate valve with pneumatic actuator

Submersible pump

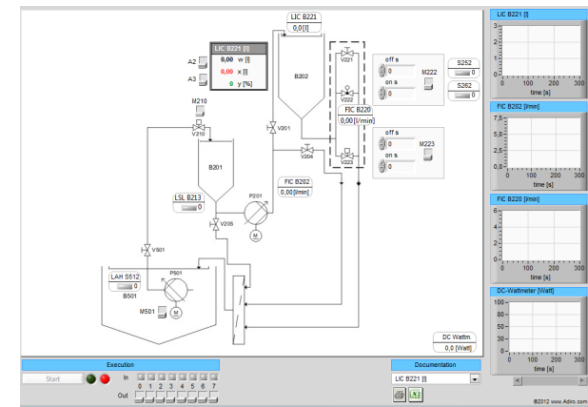


Ohjelmistojen toiminnallisuus integroitu opetustavoitteisiin

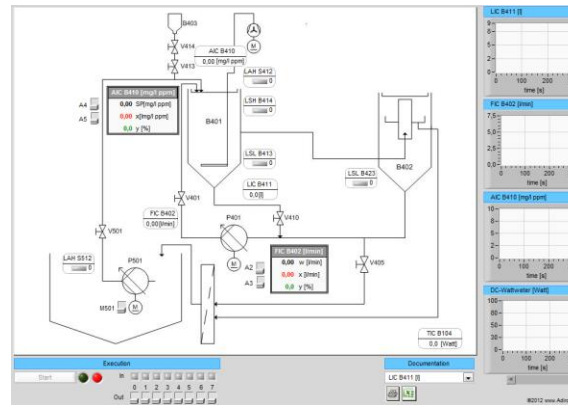
A Windows-based PC tool depicts the equipment modules and processes. A clear menu structure and the simple graphical interface meet the didactic demands of instructors and trainers. All exercises can be selected for various levels. From beginner to expert.



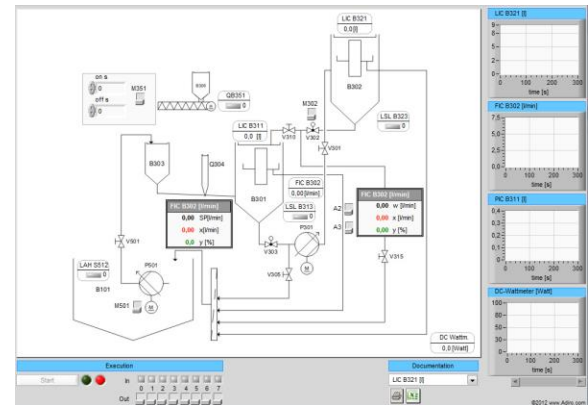
Water purification



Water supply



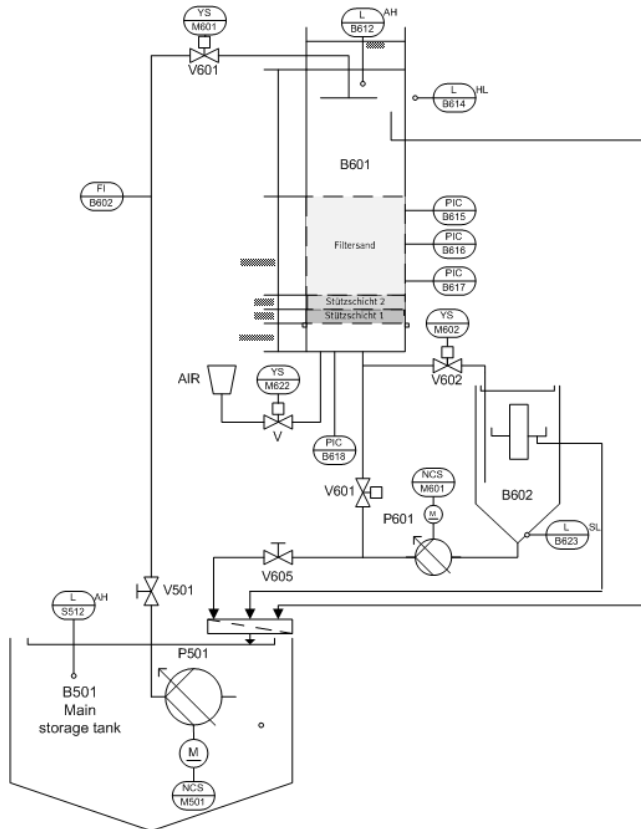
Wastewater treatment



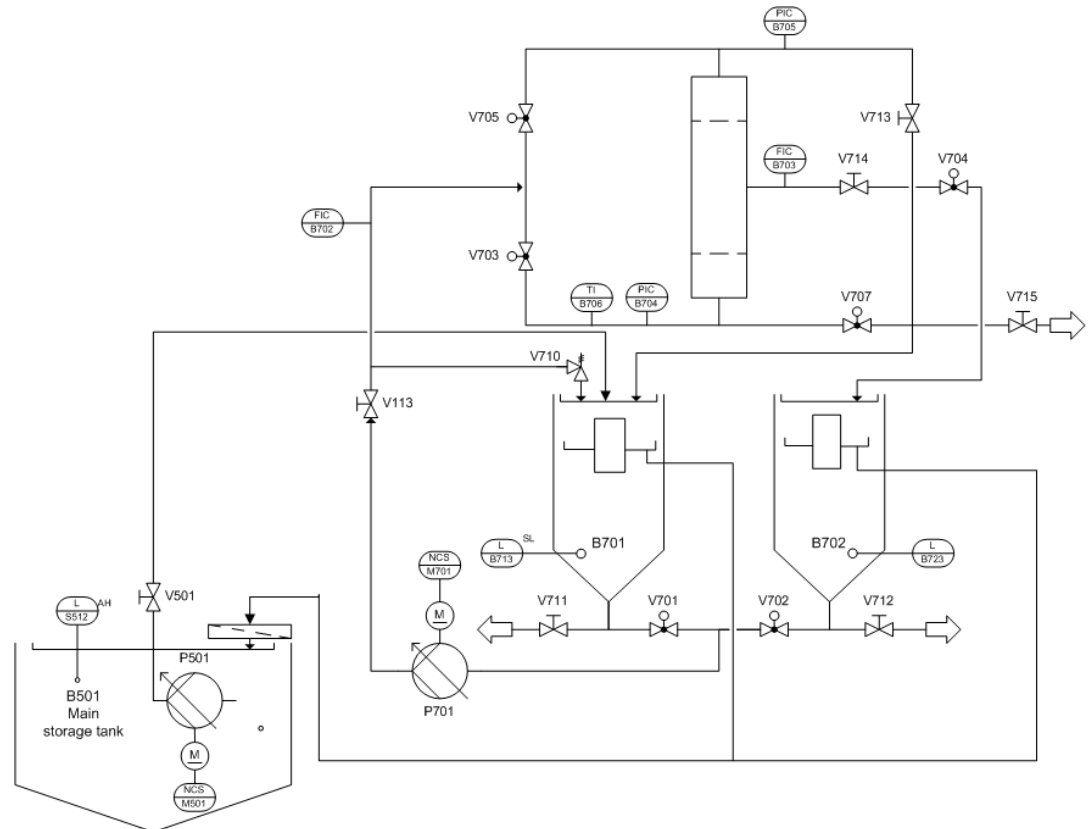
Wastewater transport

Laajennusosat suodatukseseen

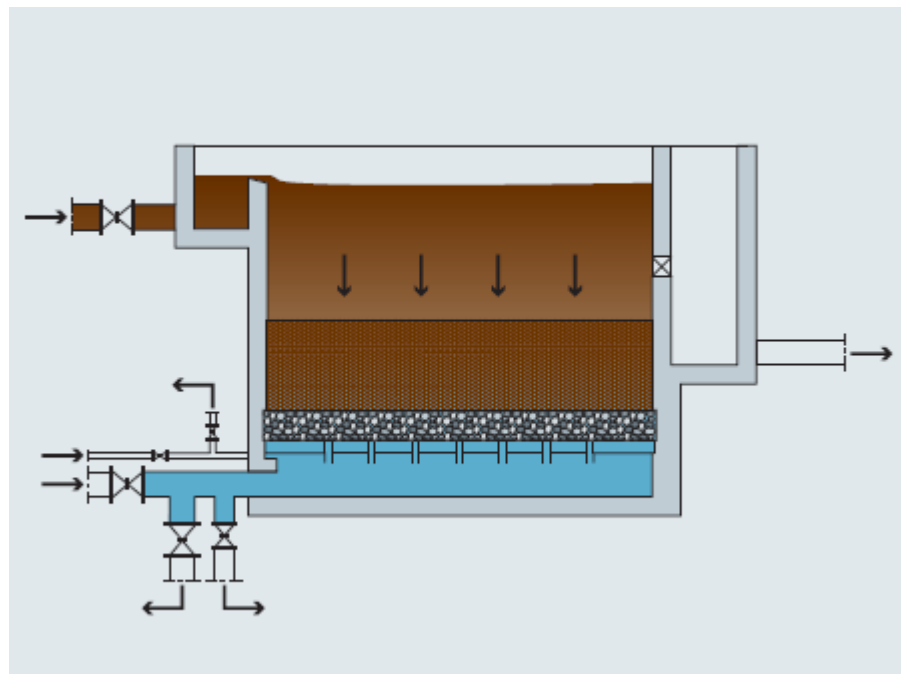
Sand filtration



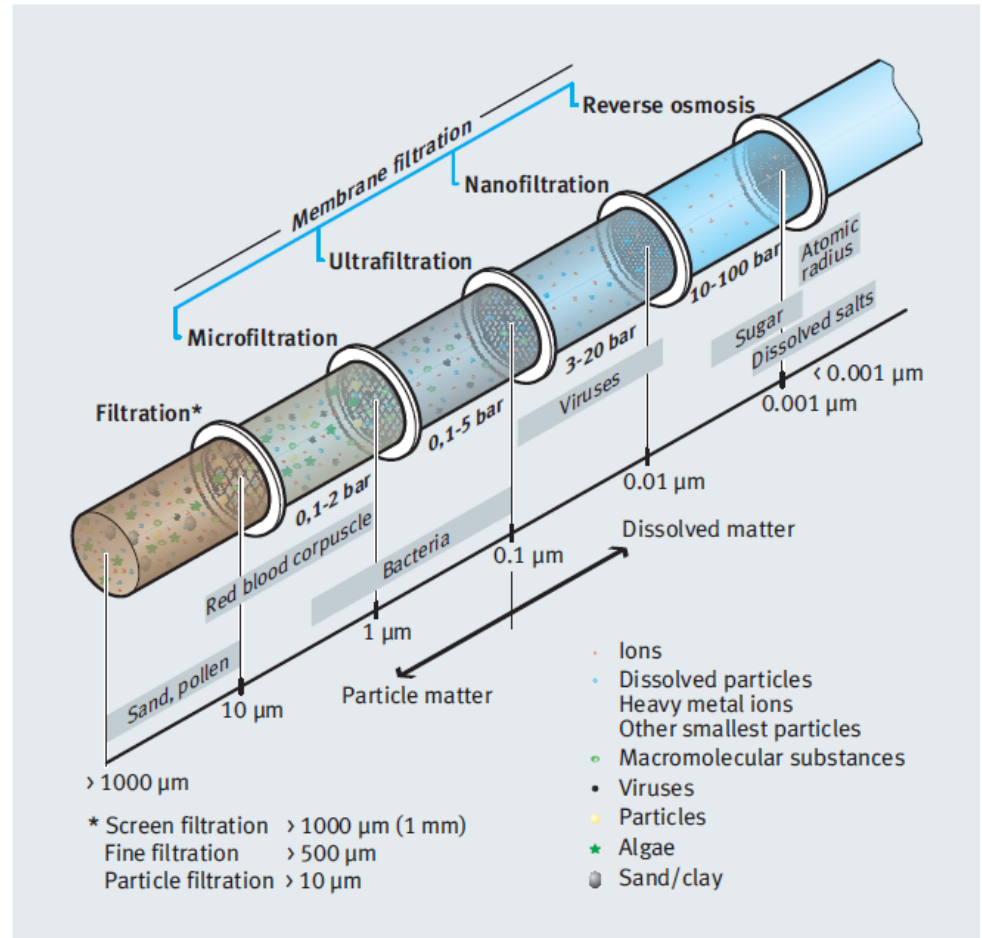
Membrane filtration



Hiekkasuodatus, 1mm – 10µm



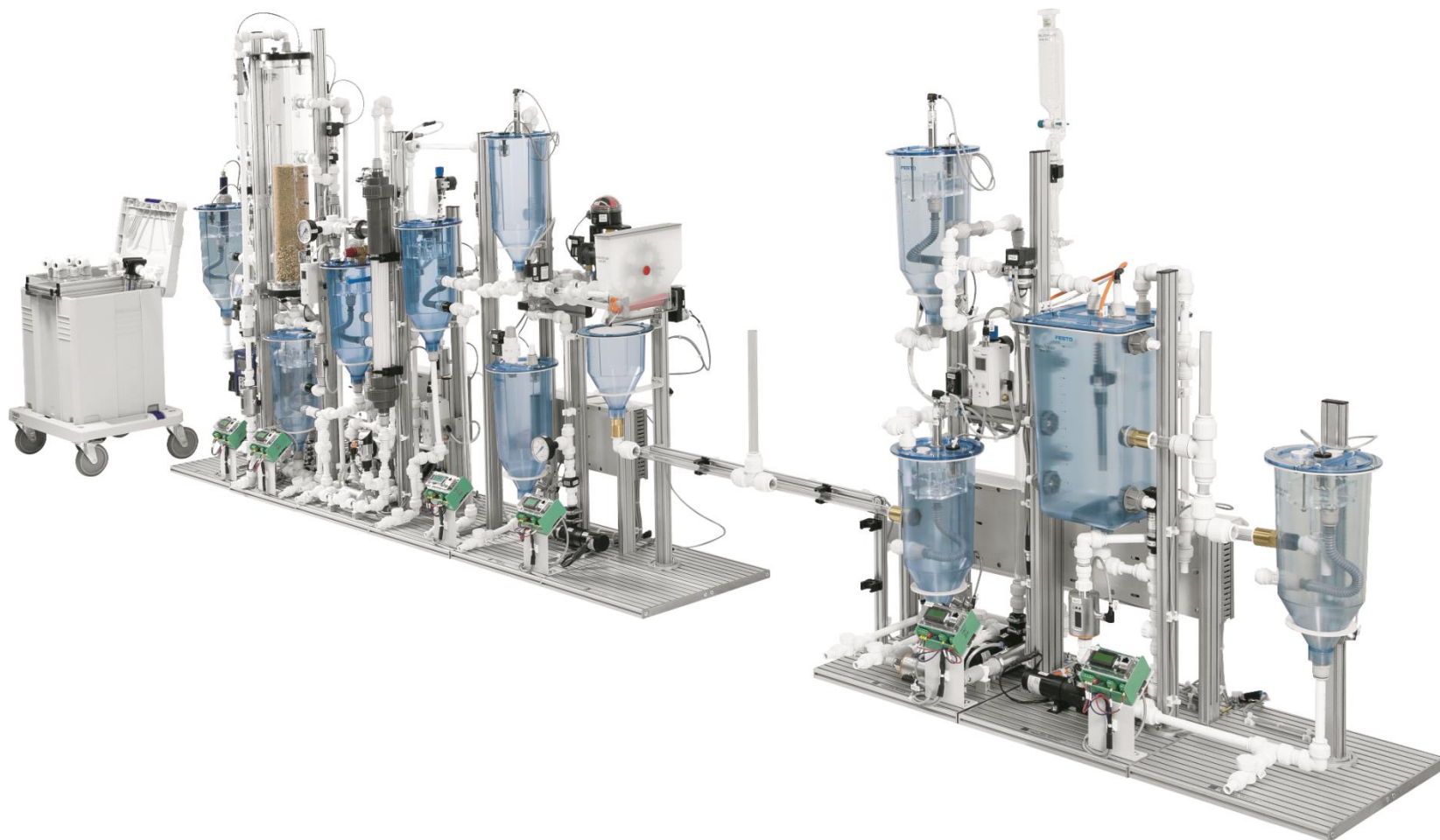
Kalvosuodatus, 10µm – 0,01µm



4 asemaa + molemmat suodatukset, esimerkki 1



4 asemaa + molemmat suodatukset, esimerkki 2



VR simulaattori jätevesilaitoksen toiminnan & haasteiden ymmärtämiseen

Immersive training for water and wastewater professionals



Learn faster, remember longer, make better decisions

With the VR simulator, participants can learn by doing, which increases understanding and retention of the newly acquired knowledge. Training in a VR environment is very realistic and participants can make mistakes without being subjected to any real danger.

Currently included scenarios

- Cleaning and reinstalling a sensor
- Manually actuating bypass sluices
- Recovering a water pump with the help of a crane
- Analysing/eliminating errors for an oxygen sensor
- All exercises are completed in combination with the control room



VR simulaattori jätevesilaitoksen toiminnan & haasteiden ymmärtämiseen

Immersive training for water and wastewater professionals



Stationary / Mobile solution

The software is preinstalled and tested on a high-performance desktop PC / Laptop*. The PC and all VR components (currently: HTC VIVE set consisting of VR glasses, two wireless controllers and two base stations which permit 360° motion tracking within a predefined space) are supplied in a hard case.



* Computer brands may vary (subject to availability)

Your partner for water technology. Aika kysymyksille..

Lisätiedot, Festo Oy

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