

Product information



SiC flat sheet membranes and modules

Cembrane Introduction



„We produce and develop a new generation SiC ceramic membrane from our facilities in Denmark. We provide OEM & System integrator in more than 20 countries with a unique outside-in flat sheet membrane and module to treat challenging drinking- and waste waters“

- Manufacture Silicon Carbide (SiC) Ceramic UF membranes
- Sell to OEM/Integrated Solutions providers
- Production facilities in Denmark
- Patented membrane technology



SiC FLAT SHEET MEMBRANE

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SiC FLAT SHEET MEMBRANE

DESIGN & SPECIFICATIONS

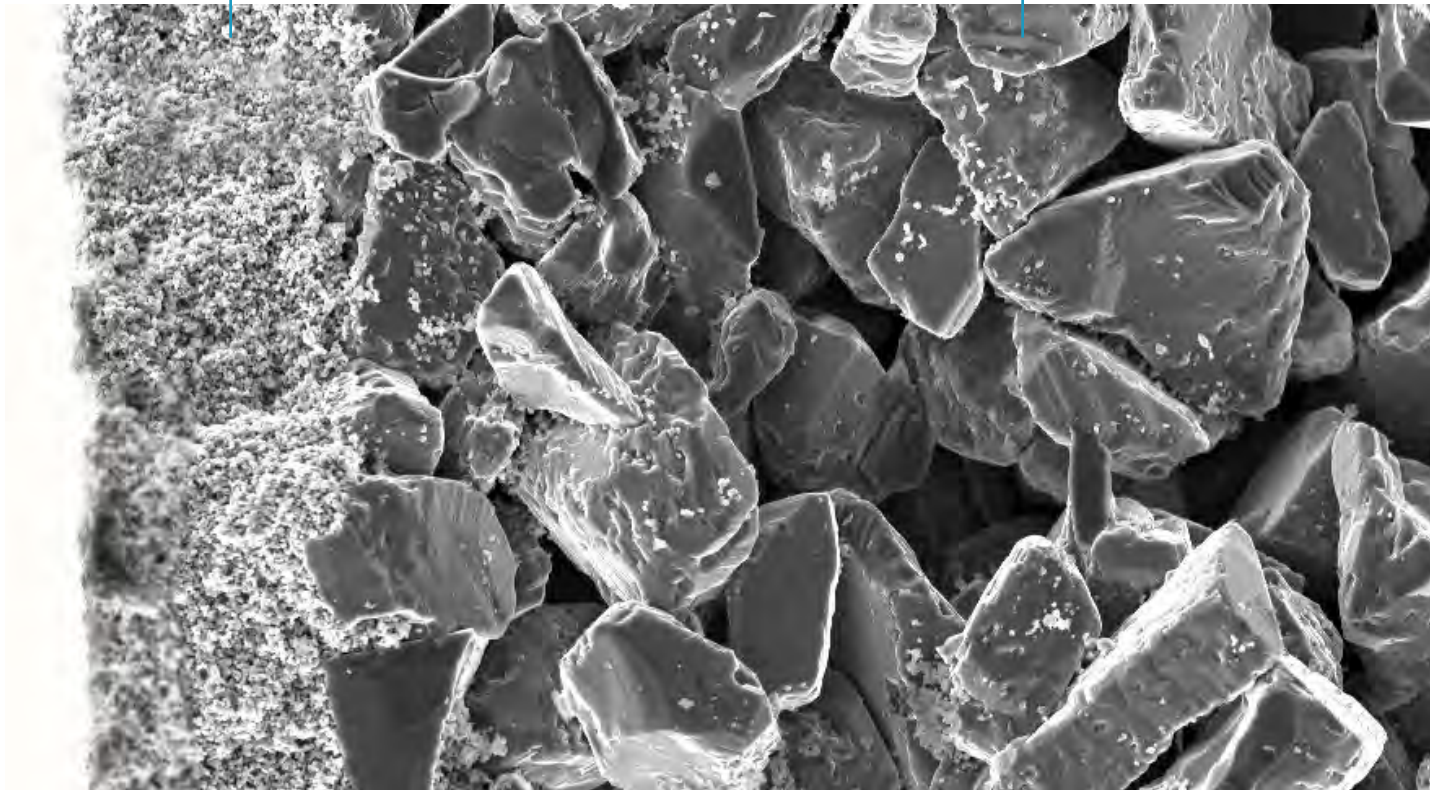
SiC FLAT SHEET MEMBRANE



Membrane material	Silicon Carbide
O-ring material	Viton/EPDM/NBR (NSF61)
End-cap material	Reinforced fiberglass PPS (NSF61)
Active membrane surface	0.1752 m ²
Pore size filter active layer	0.1 micron
pH range	1 - 14
Permeability	5,000 LMHbar @ 20°C
Special features	Double side filtered water outlet for high flux operation Double O-ring connection Self-degassing due to filtered water outlet at the top of the end-cap Chemically inert at any pH Hydrophilic material providing an unmatched high flux operation Repels negatively charged particles, like bacteria, algae, MLSS, TEP and oil Hardest available membrane material

Filter active layer
on the outside of the membrane plate
0.1 micron

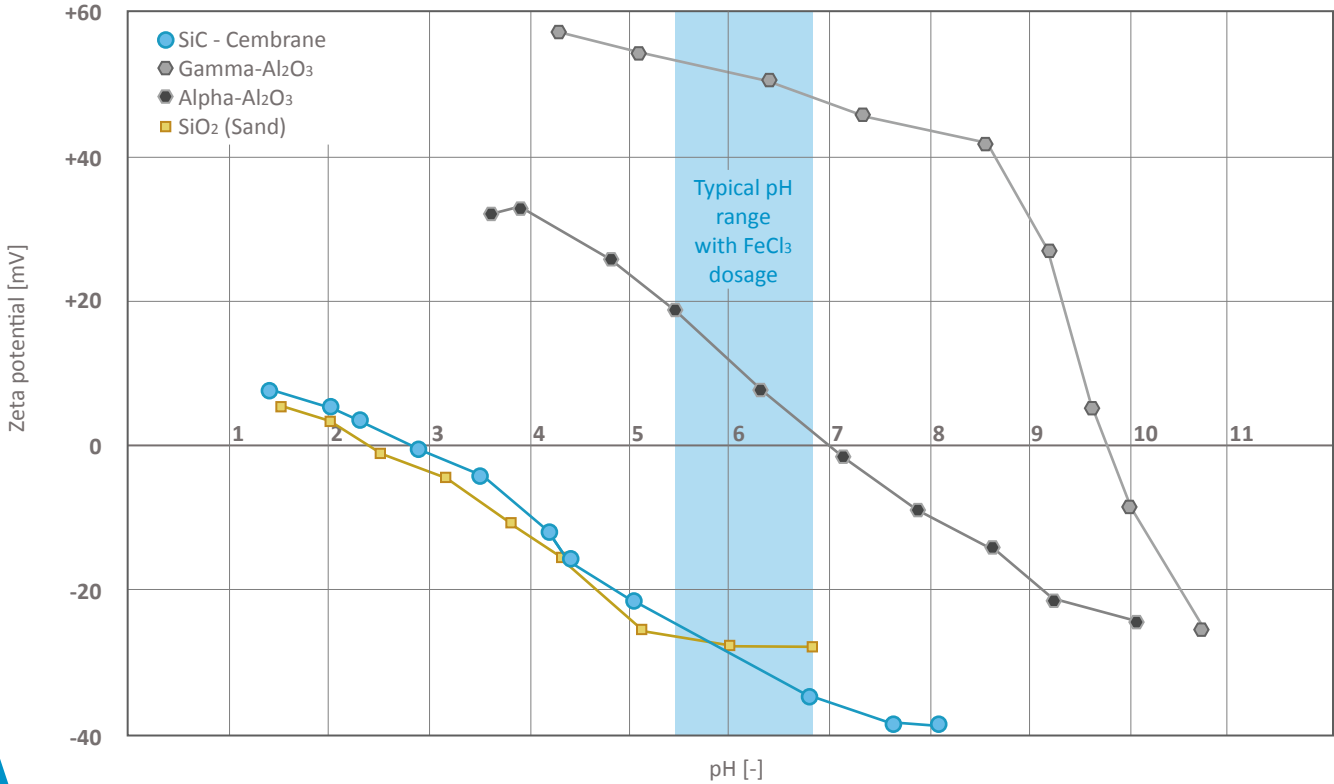
Membrane body (substrate)
with very large pore size
8 micron



- Highly asymmetric membrane structure
- Unique production know-how of coating 0.1 micron layer directly onto large pore sized membrane body without intermediate layer
- Very high membrane porosity of around 43%

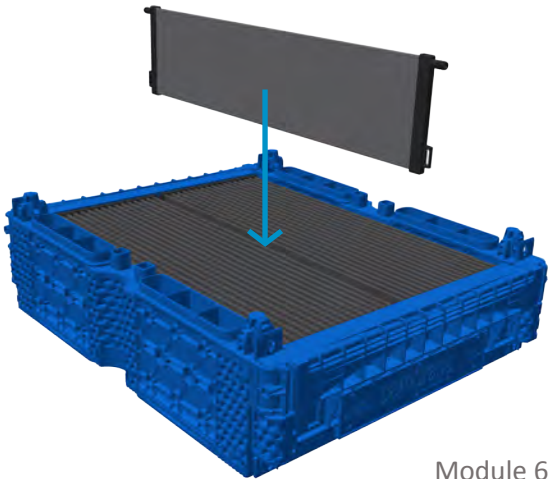
SiC MEMBRANE SURFACE CHARGE

SiC FLAT SHEET MEMBRANE

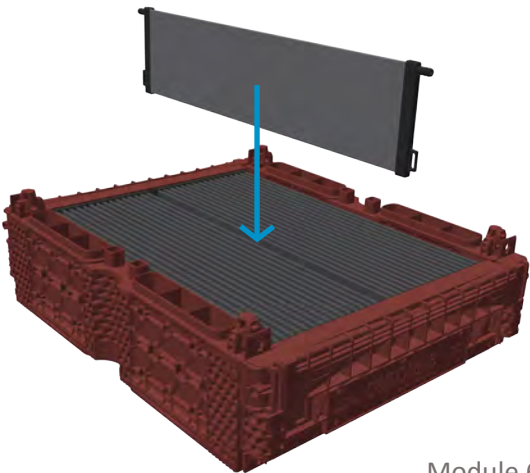


- Highly negatively charged membrane surface
- Always negative Zeta potential for complete operating pH range
- Ensured anti clogging effect - Highest and stable flux operation at pH below 7
- Ideal operation conditions - Ferric Chloride dosage below pH 6 for maximum coagulation and removal of DOC and TEP and still negatively charged membrane surface of -25 to -30 mV
- Easy removal of all negatively charged water contents, like bacteria, algae, MLSS, TEP or oil

MODULE DESIGN



Module 6.0 S

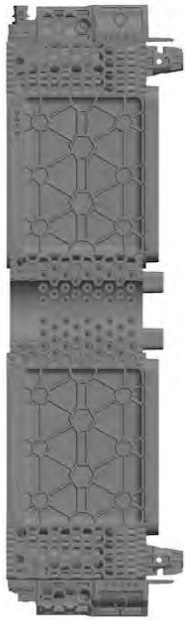
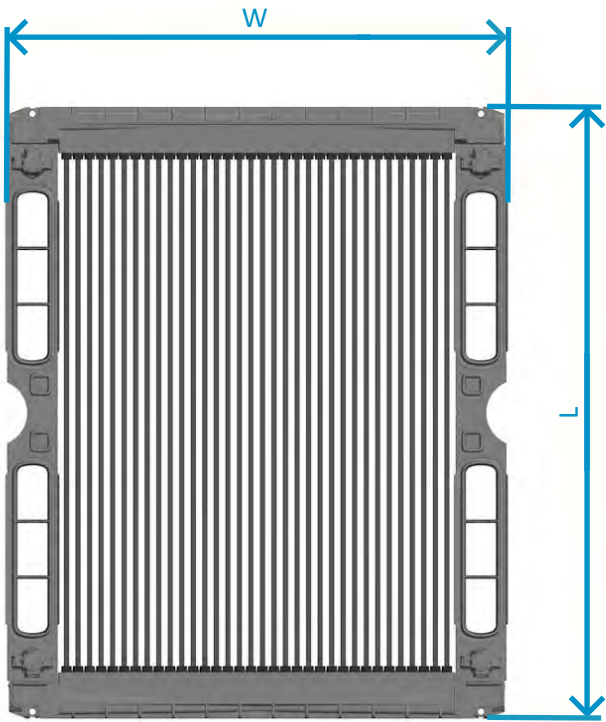
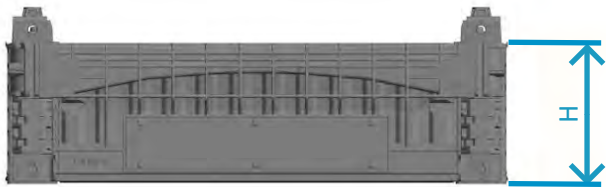


Module 6.0 H

Module housing material	Reinforced fiberglass PPO/PS (NSF61)
O-ring material	Viton/EPDM/NBR (NSF61)
No. of single ceramic plates	34
Avg. distance between ceramic plates	6.7 mm
Active membrane surface	6.0 m²
Max. hydraulic flow	9.0 m³/hr (1,500 LMH)
Max. filtration pressure	-0.7 bar
Max. backwash pressure	2.0 bar
Temperature operating range	5 - 60 °C (Module 6.0 S) 20 - 80°C (Module 6.0 H)
Field of application	Drinking water / waste water / industrial
Special features	Multi ceramic plate configuration with exchangeable single ceramic plates Internally filtered water piping - no additional external piping required Module housing fully made in plastic - free of any steel parts suitable for harsh applications, like ground and seawater or other challenging applications NFC tag system for online membrane performance monitoring

DIMENSION & WEIGHT

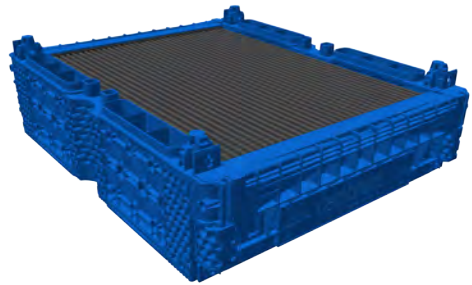
MODULE DESIGN



Length L	700 mm
Width W	576 mm
Height H	160 mm
Weight	Approx. 35.7 kg (dry) / Approx 47.0 kg (wet)

TOWER-RACK DESIGN

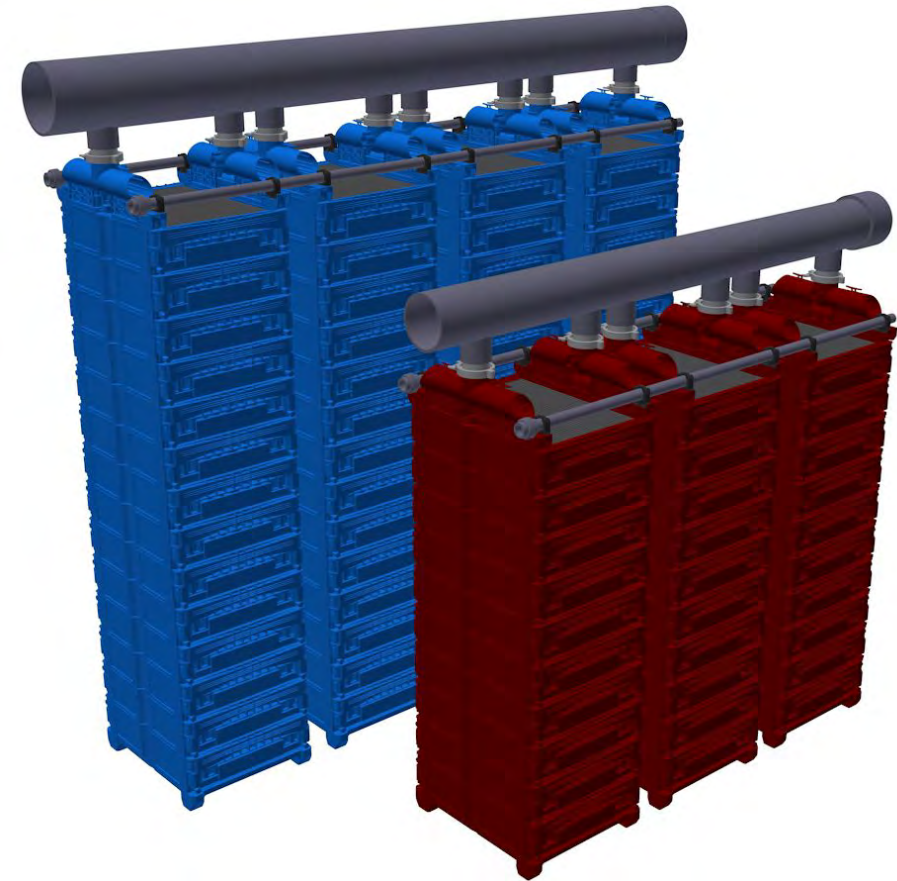
Single module



Single tower



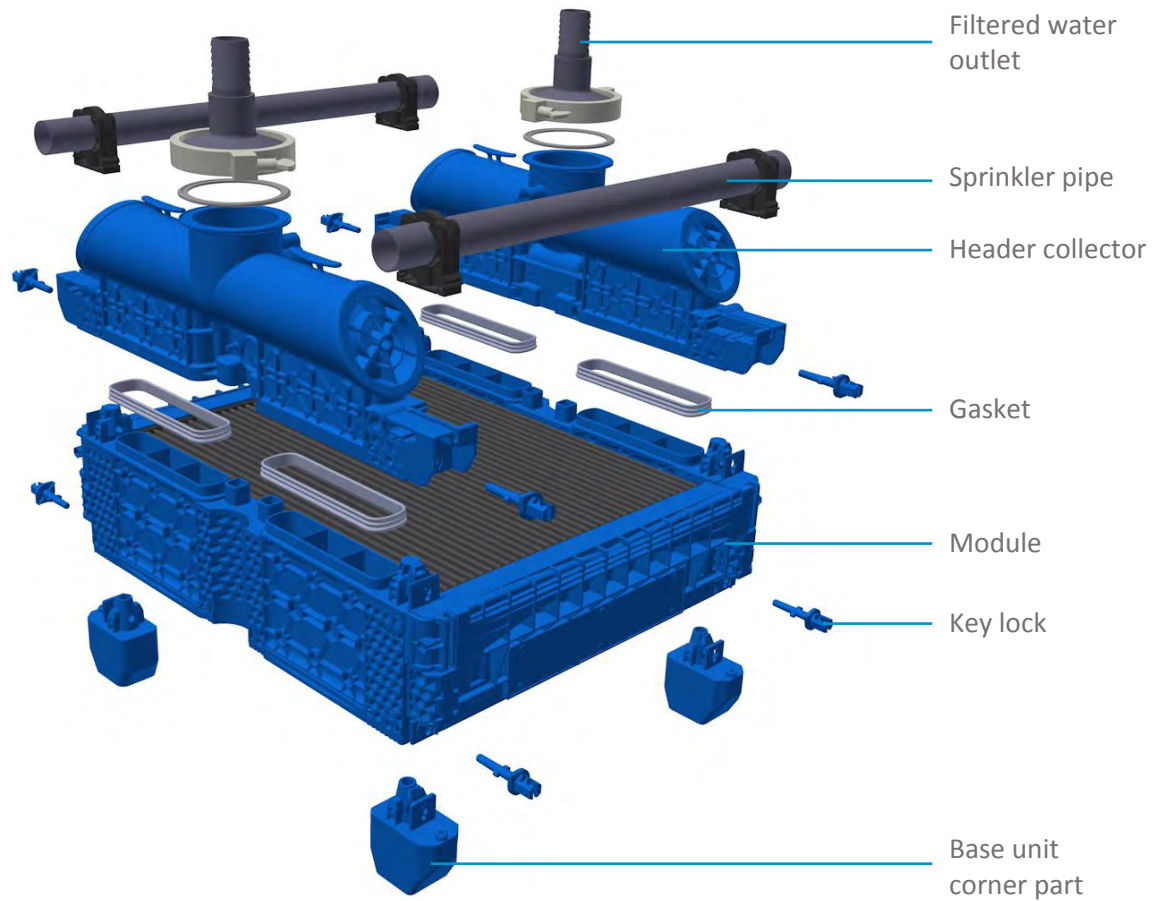
Tower-Rack



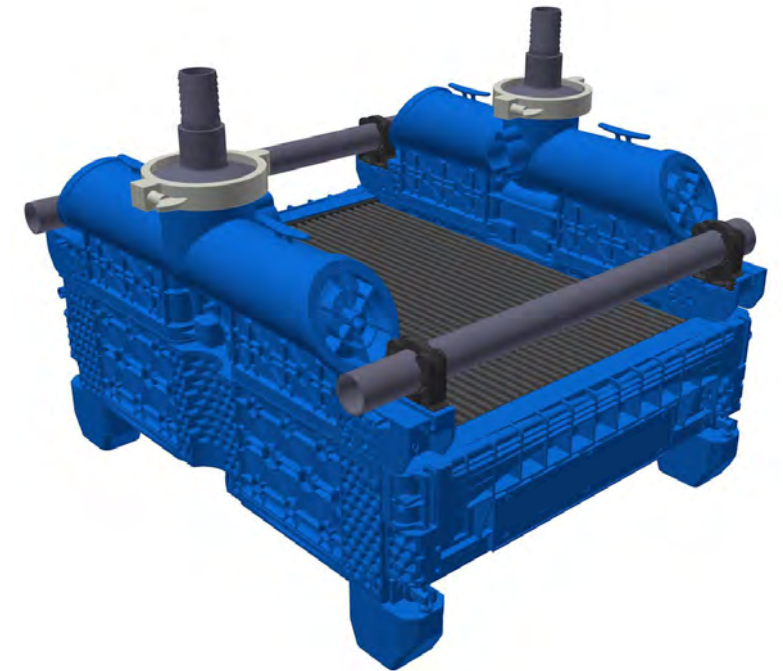
SINGLE TOWER 1-4 MODULES

TOWER-RACK DESIGN

Exploded



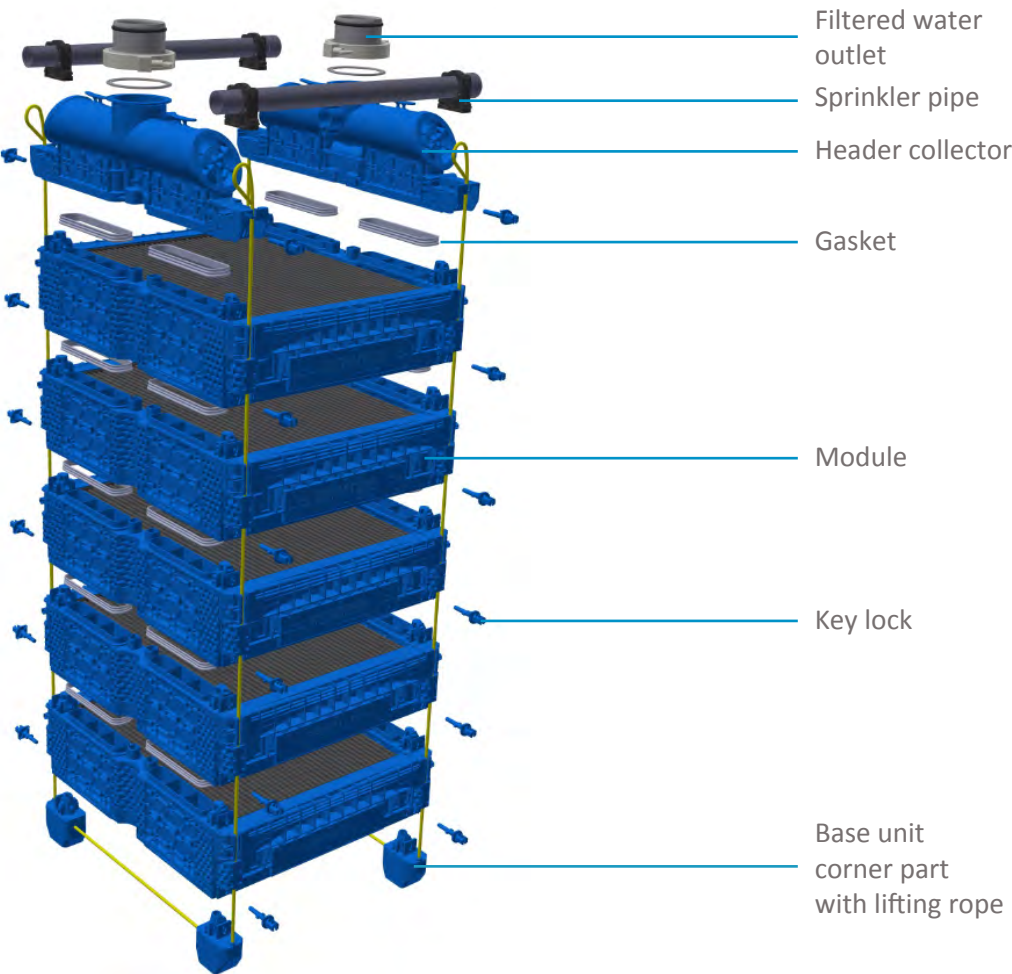
Assembled



SINGLE TOWER 5-15 MODULES

TOWER-RACK DESIGN

Exploded

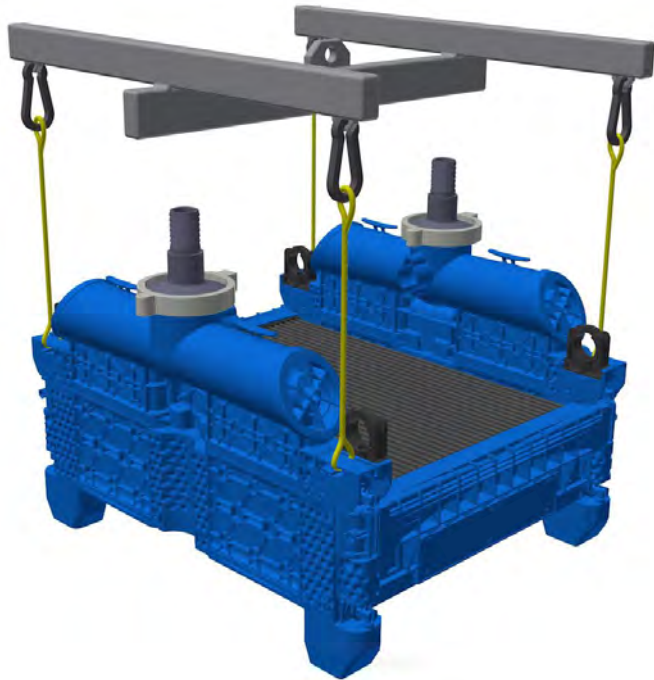


Assembled



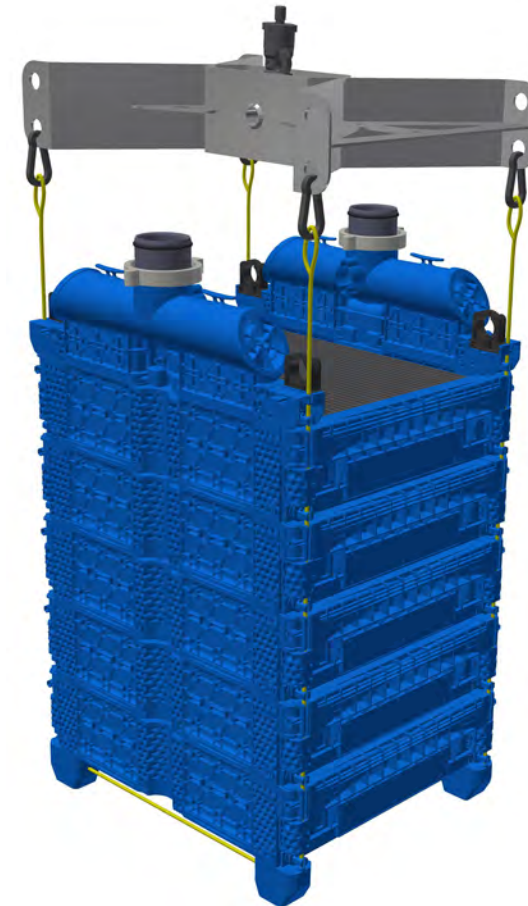
1 - 4 Modules

Simple traverse with direct connection of ropes on both header collectors



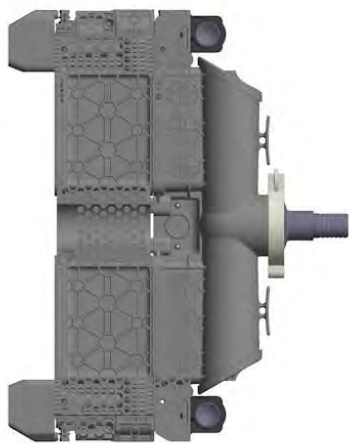
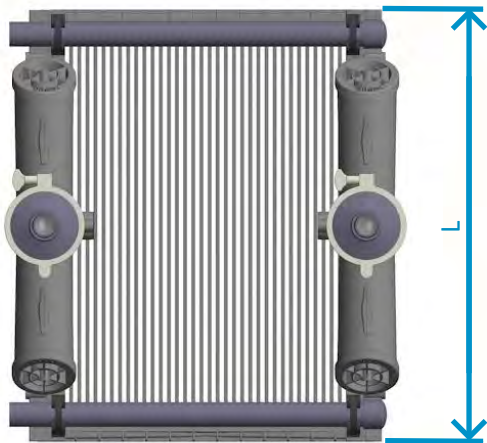
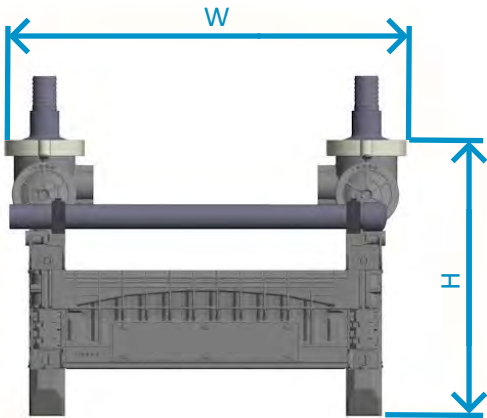
5 - 15 Modules

Compact traverse with connection of rope system with base unit



SPECIFICATIONS, DIMENSIONS & WEIGHT

TOWER-RACK DESIGN

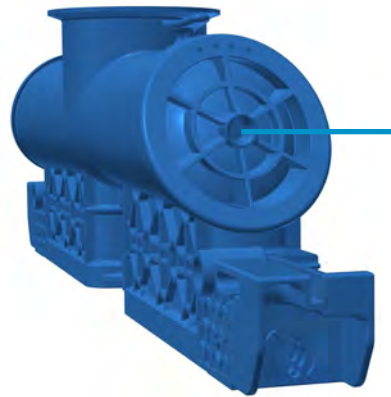


Module type	Module 6.0 S	Module 6.0 H
No. of modules per single tower	1 - 15	1 - 9
No. of single towers per rack	1 - 6	1 - 4
Length L	700 mm	
Width W	655 mm	
Height H (with 1 module)	450 mm	
Extra height per module	160 mm	
Weight (with 1 module)	Approx. 41.0 kg (dry) / Approx. 52.0 kg (wet)	
Extra weight per module	Approx. 35.7 kg (dry) / Approx. 47.0 kg (wet)	
Displacement volume (with 1 module)	32 Liters	
Extra displacement volume per module	25 Liters	
Special features	<p>Maximum flexibility due to fully modular concept with free selection of modules per tower and towers per rack</p> <p>Most compact installation due to frameless rack design</p> <p>Easy tower assembly due to simple key lock connection</p> <p>Lift or removal option for single towers (remaining towers stay in operation)</p> <p>Integrated double sprinkler line for enhanced cake layer removal and chemical spray</p> <p>Header system with option of direct injection of chemicals into header collector or connection of additional instrumentation</p>	

HEADER SYSTEM

KEY FEATURES

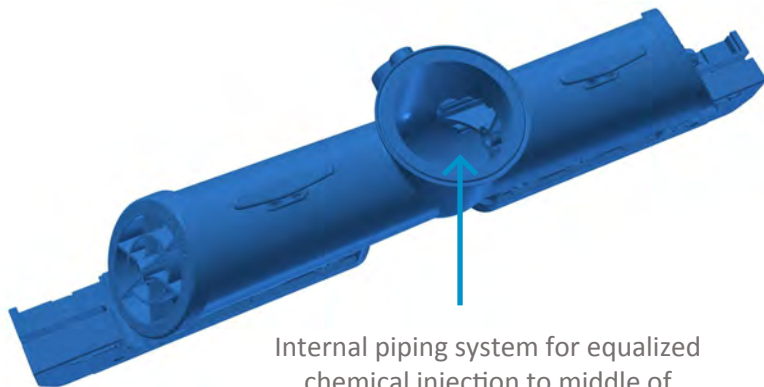
HEADER SYSTEM



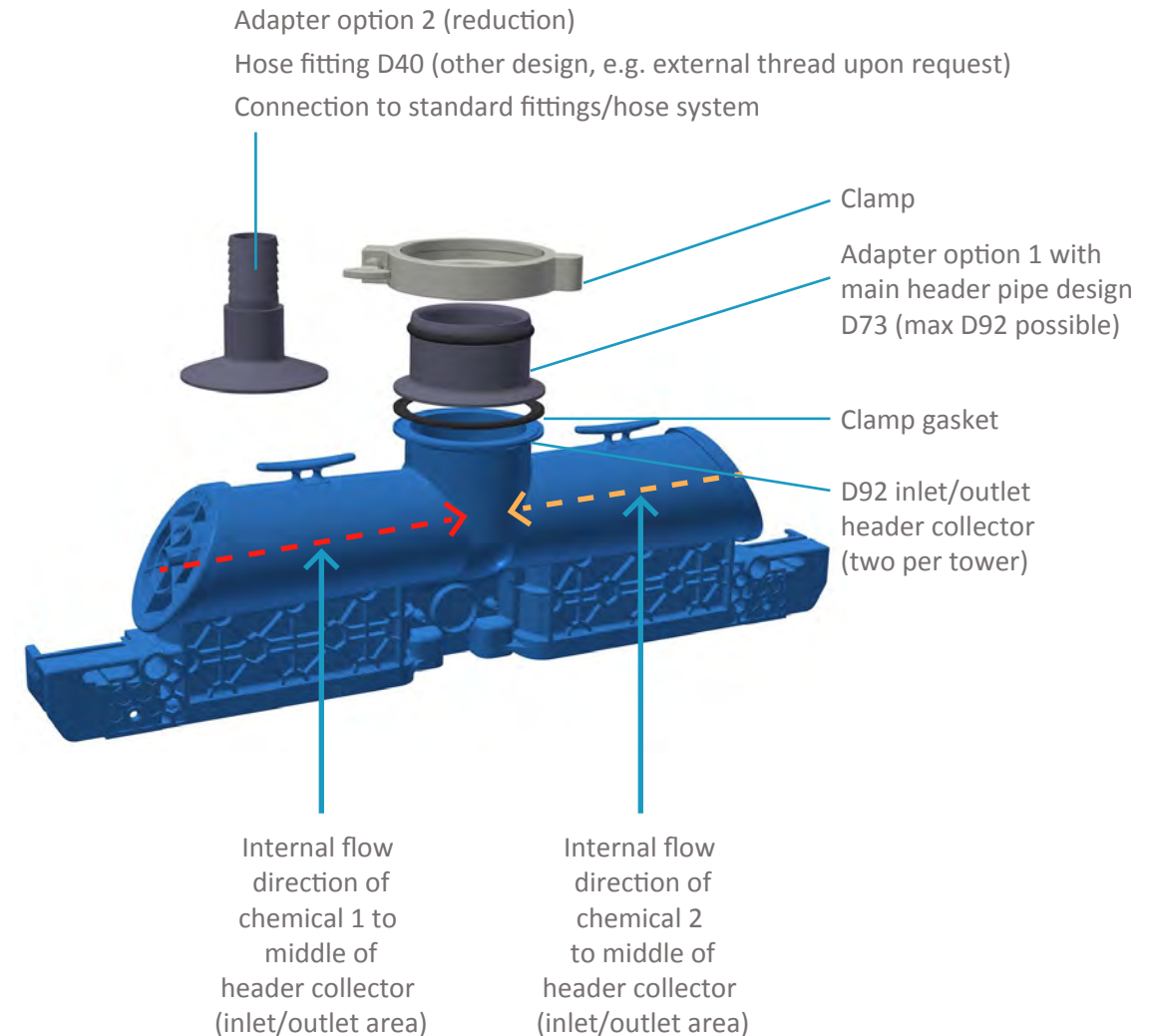
Option of direct connections to header collector for:

- Injection of chemicals
- Single tower instrumentation, like pressure, temperature and other

Two connections on each collector
Closed hole to be opened
(inside thread e.g. G1/4 or M12)



Internal piping system for equalized chemical injection to middle of header collector inlet/outlet



Adapter option 2 (reduction)

Hose fitting D40 (other design, e.g. external thread upon request)

Connection to standard fittings/hose system

Clamp

Adapter option 1 with main header pipe design D73 (max D92 possible)

Clamp gasket

D92 inlet/outlet header collector (two per tower)

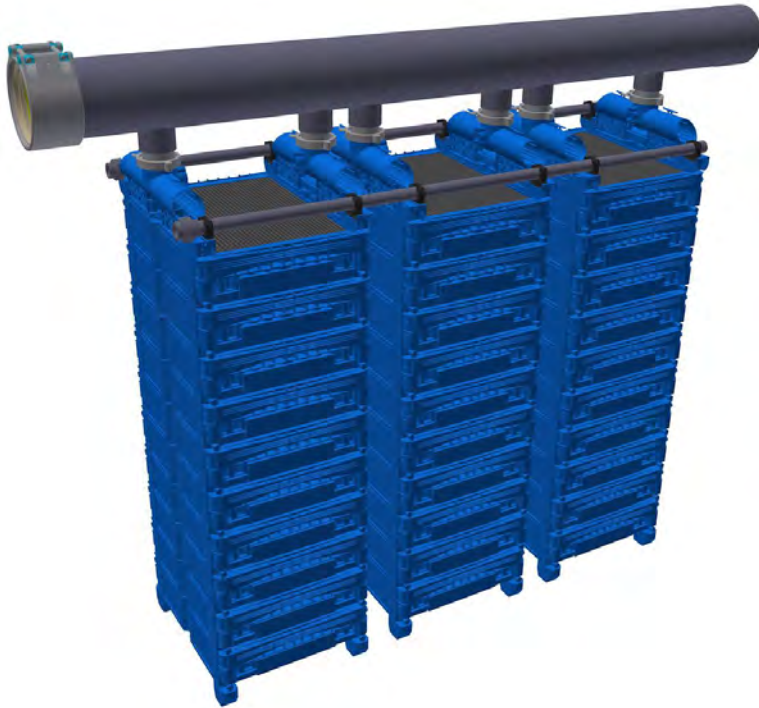
Internal flow direction of chemical 1 to middle of header collector (inlet/outlet area)

Internal flow direction of chemical 2 to middle of header collector (inlet/outlet area)

CONNECTION OPTIONS FILTERED WATER LINE

HEADER SYSTEM

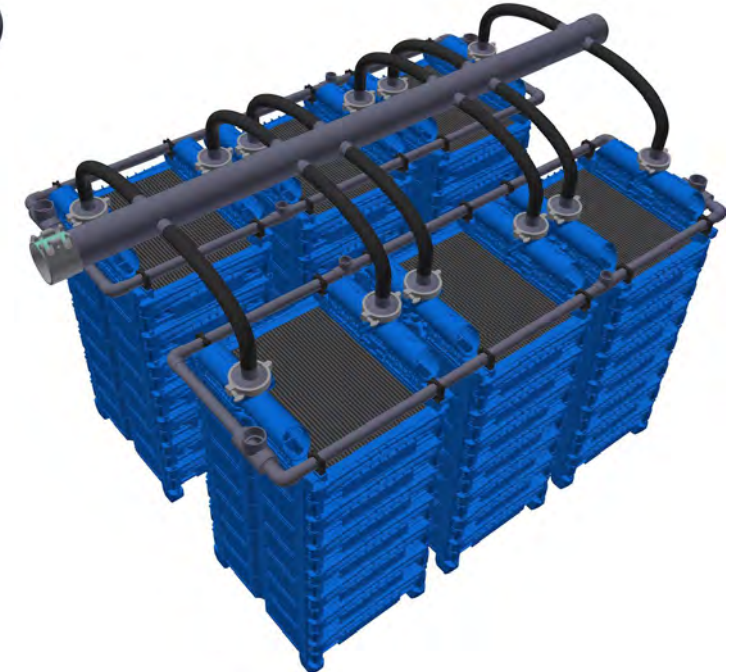
cembrane
clean water for life



Single header pipe for each
Tower-Rack line with
pipe connection to single towers
for new build projects
Typically used for drinking water applications
with high flux of up to 1,500 LMH



Single header pipe for each
Tower-Rack line with
intermediate hose connection to single towers
for retrofit/rehabilitation/replacement projects
(larger/existing tolerances can be compensated)
Typically used for drinking water applications
with high flux of up to 1,500 LMH



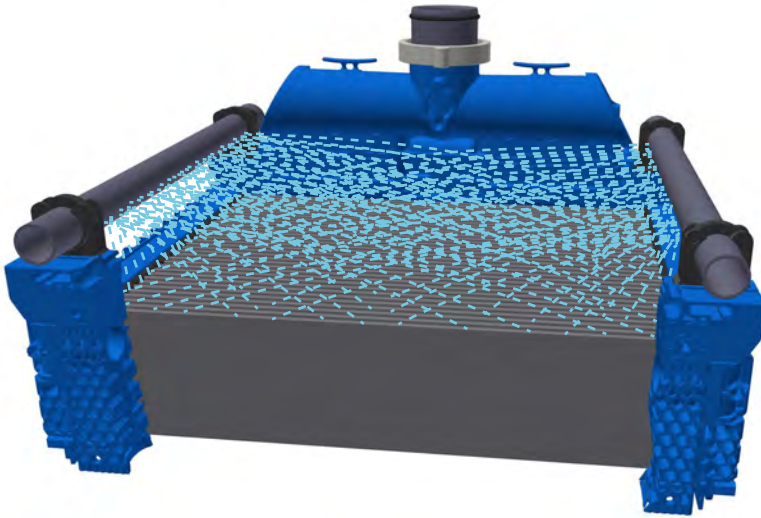
Common header pipe connection
through hoses
Typically used for applications
with low flux of up to 200 LMH,
e.g. MBR systems

SPRINKLER SYSTEM

HOW IT WORKS

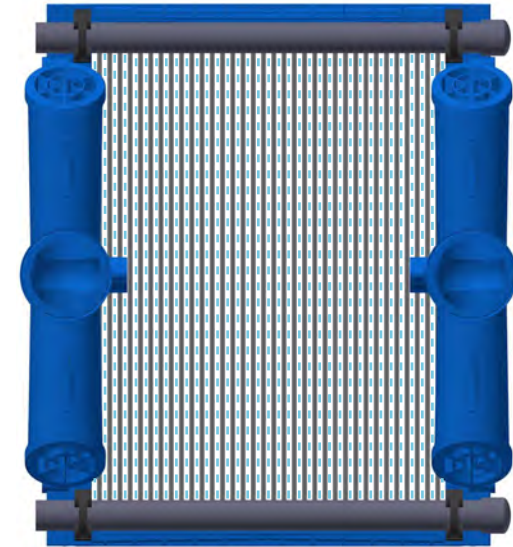
SPRINKLER SYSTEM

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clean water for life



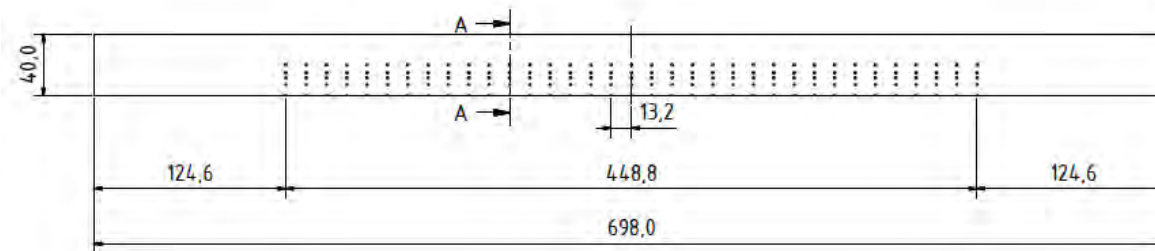
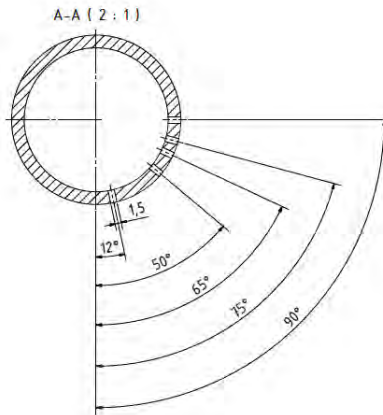
2 perforated pipes each with 175 holes lead to a comprehensive spray over the complete module area

- Novel double line sprinkler for optimized distribution
- Sprinkler to be used for mechanical cleaning, e.g. cake layer removal, as high-pressure water jet with a maximum spray flow of up to 20 m³/hr @ 2 bar
- Efficient chemical cleaning option (CapClean) by spray of concentrated chemicals at low quantity directly on the membrane surface (on-air cleaning) with a maximum spray flow of up to 8 m³/hr @ 1 bar



Hole positions are designed to spray between each single ceramic plate

Sprinkler Pipe Dimensions



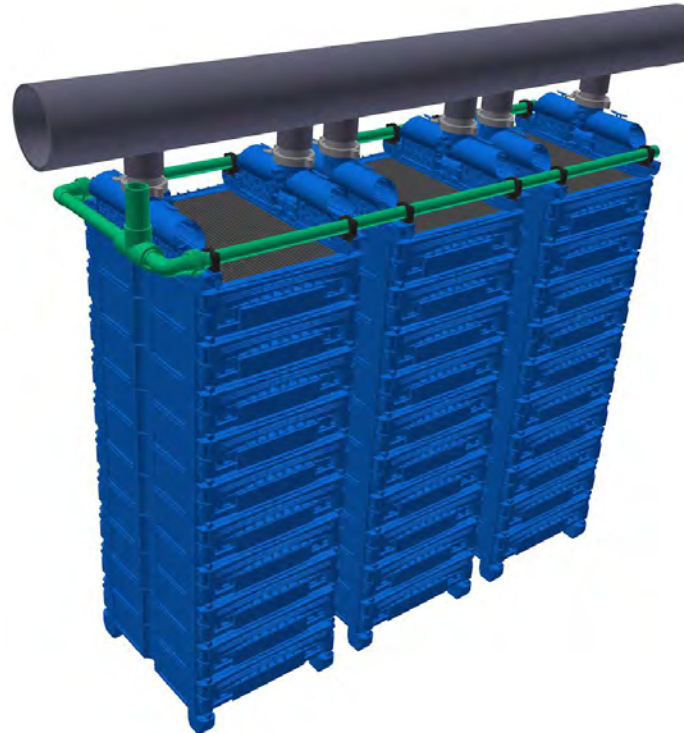
CONNECTION OPTIONS SPRINKLER/CAPCLEAN LINE

SPRINKLER SYSTEM

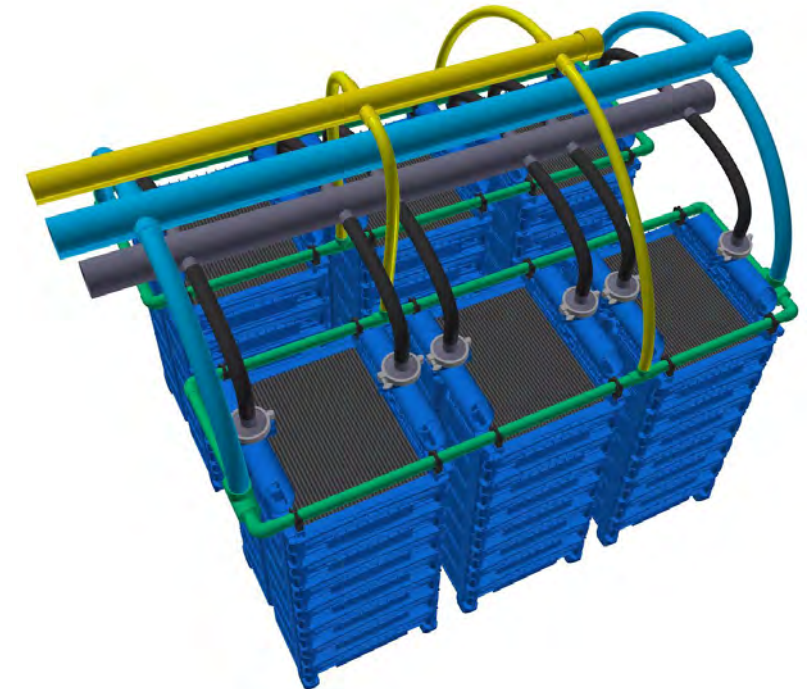
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clean water for life



Combined Sprinkler & CapClean
single connection to hose



Combined Sprinkler & CapClean
single connection to hose or piping
Typically used for drinking water applications



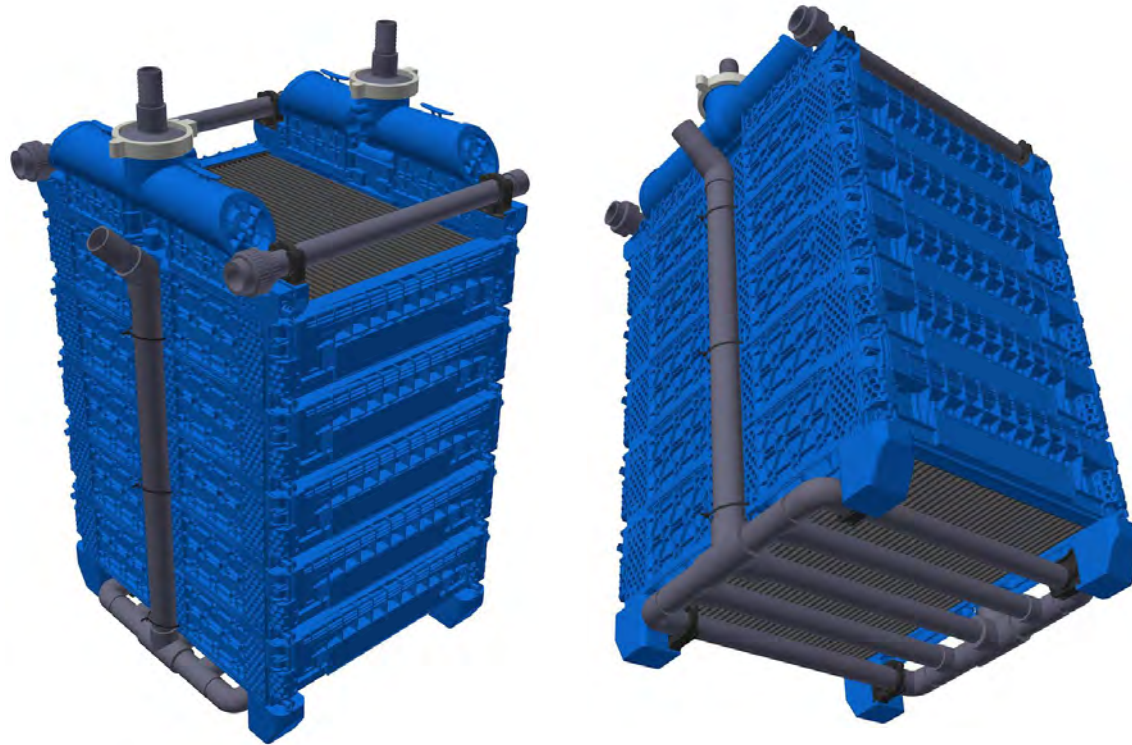
Separate Sprinkler & CapClean
connection with ring line
Typically used for sewage applications
or connection to more than 4 towers

AIR-SCOURING SYSTEM

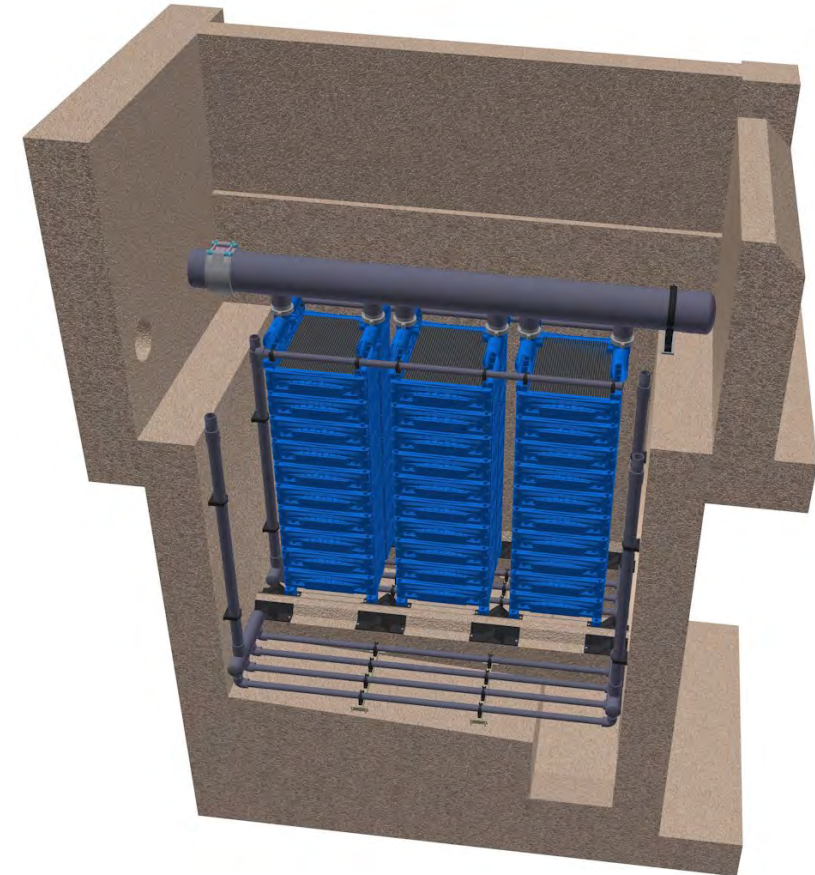
CONNECTION OPTIONS AIR-SCOURING

AIR-SCOURING SYSTEM

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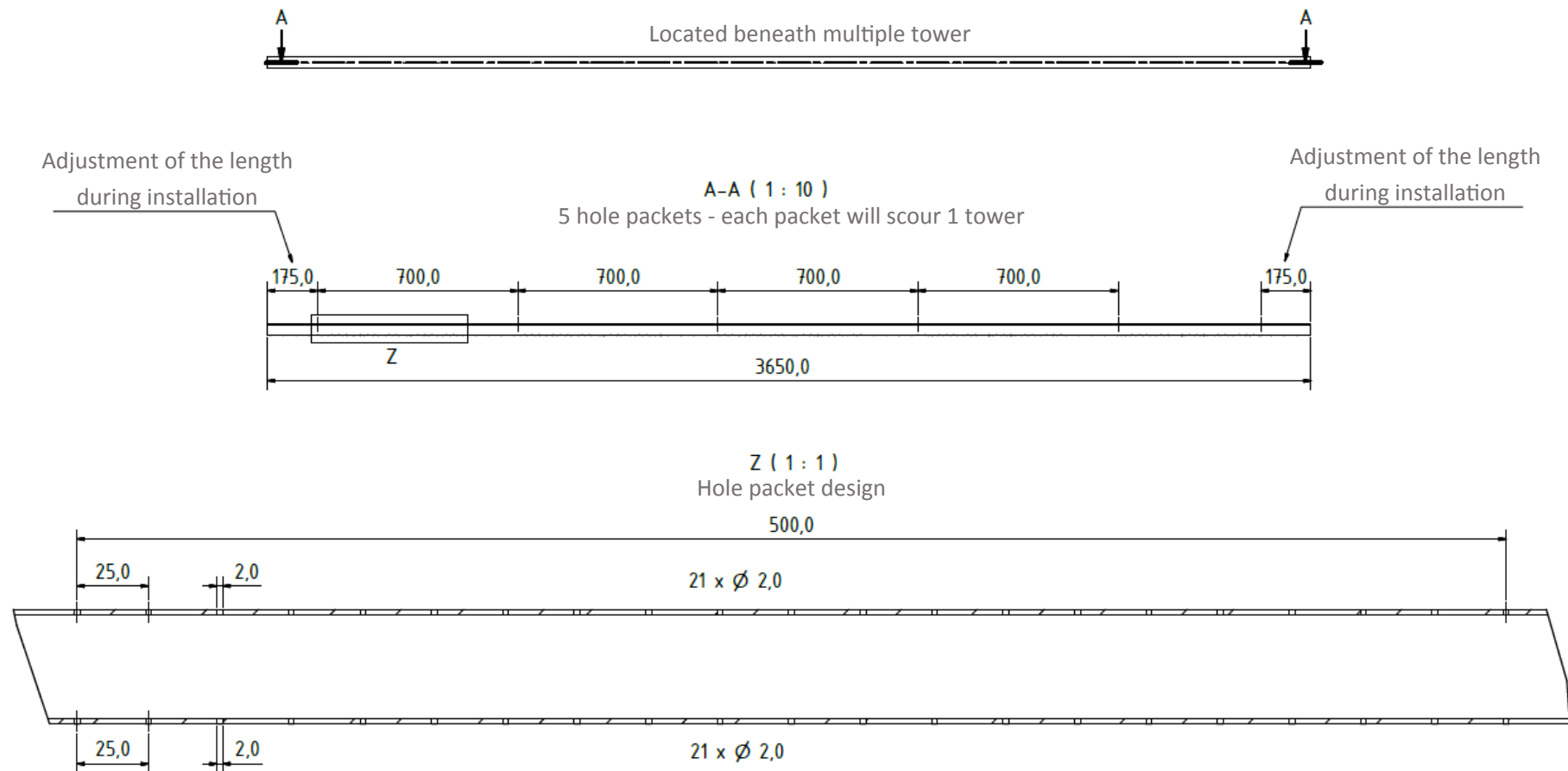


Direct connection on base unit for single tower



Separate installation on the bottom of the filtration tank
Typically used for Tower-Rack to keep option of single tower
lifting and operation of remaining towers

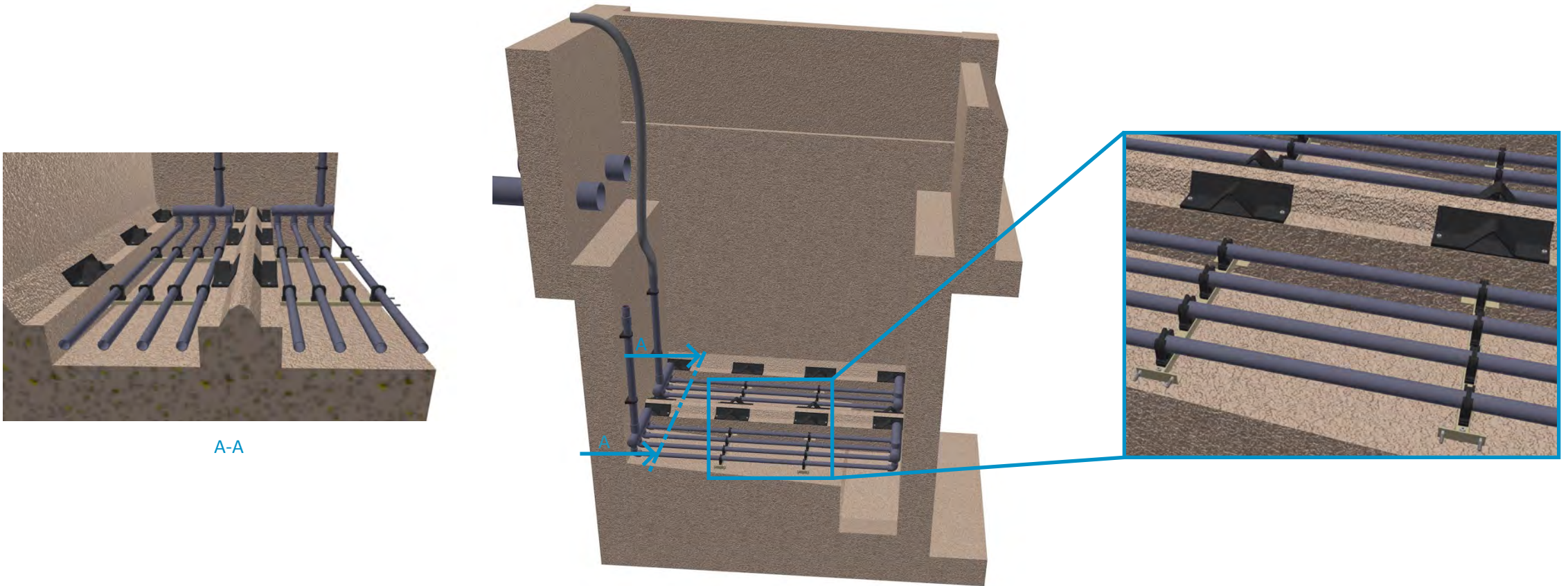
5-Tower Air-Scouring Pipe Example



HOW TO INSTALL

INSTALLATION EXAMPLE TOWER-RACK

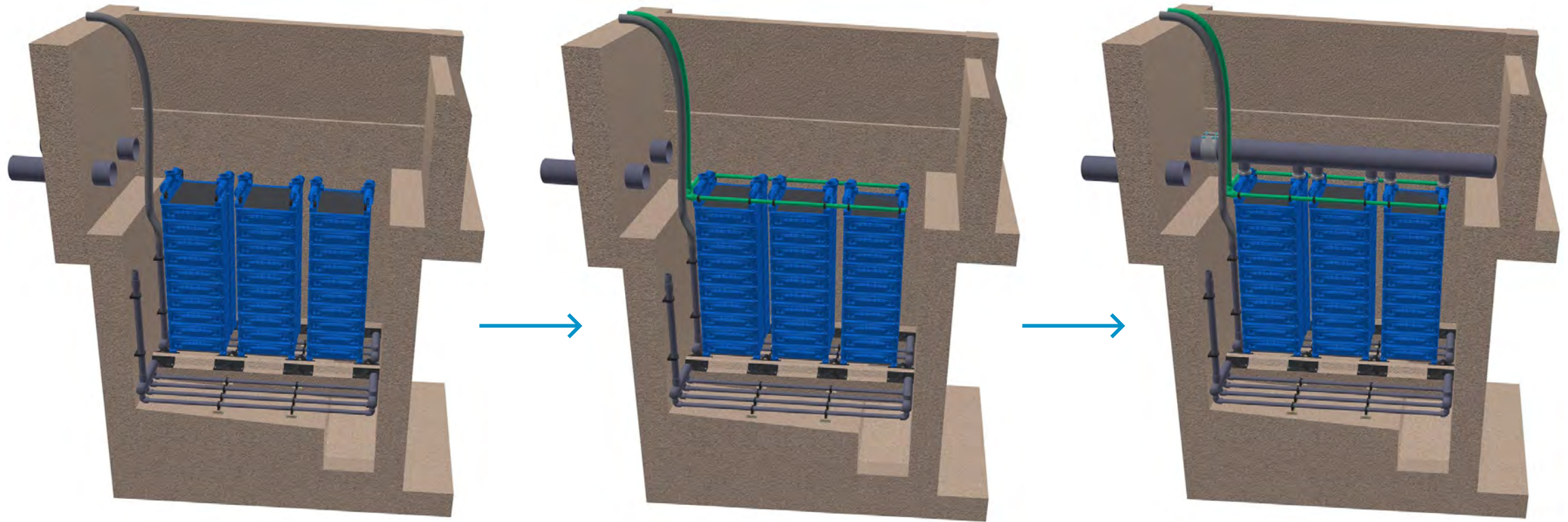
HOW TO INSTALL



Step 1: Installation of air-scouring system and single tower position supports on the bottom of the concrete tank

INSTALLATION EXAMPLE TOWER-RACK

HOW TO INSTALL



Step 2: Installation of single towers

Step 3: Installation of sprinkler system

Step 4: Installation of filtered water header line

Process Flow Diagram

HOW TO INSTALL

