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Technical datasheets

Pilot plants

Pilot plants

Cutting-edge technologies

Modular and scalable

Easy integration

The equipment

Apria Systems designs and manufactures fully **customized pilot plants** based on membrane technologies and oxidation and reduction processes.

Our pilot plants are engineered to support process **validation, optimization, and scale-up** under controlled operating conditions, enabling the generation of reliable data for further development and industrial evaluation.

Each system is tailored to specific client requirements and can integrate advanced automation, enabling reliable **operation under a wide range of conditions**.

Installation, commissioning, training, and technical support services can also be provided to ensure proper implementation and operation.

The technology

Our pilot plants allows to select and combine different technologies, offering maximum versatility in the operation.

Membranes

Oxidation & reduction

One equipment, multiple possibilities

Selectable features

Technology	Membrane: electrodialysis, forward osmosis, gas permeation, membrane distillation, microfiltration, nanofiltration, pressure retarded osmosis, reverse electrodialysis, reverse osmosis, reversible electrodialysis, ultrafiltration Oxidation and reduction: electrochemistry, ozone, photochemistry, photoelectrochemistry, photothermochemistry
Operation mode	Continuous, recirculation
Flowrate (m^3/h)	1 – 100*
Pre-treatment	Activated carbon, disinfection, filtration
Post-treatment	Activated carbon, decantation, degassing, disinfection, ionic exchange
Hydraulic components	Manual or automatic valves, pipping, pumps, and tanks
Instrumentation and sensors	Conductivity, dissolved O_2, flow, ORP, pH, pressure, radiation*, and temperature
Temperature control system	Coil, heat cartridge, heat exchanger, heating mantle, jacketed tank, thermostatic bath
Chemical dosing system	Antifouling, general, pH adjustment
Control and automation	Data acquisition, electrical cabinet, PLC, remote supervision and operation
Assembly	Aluminum or stainless steel skid with wheels. Possibility to be installed in a container
Safety	ATEX-rated components under request

*Depending on the technology

For more information: comercial@apriasystems.es

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MEMBRANES

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The technology

We provide versatile membrane facilities on the following technologies:

Pressure

- Microfiltration
- Nanofiltration
- Reverse osmosis
- Ultrafiltration

Concentration

- Forward osmosis
- Gas permeation
- Pressure retarded osmosis
- Reverse electrodialysis

Electric potential

- Electrodialysis
- Reversible electrodialysis

Temperature

- Membrane distillation

Selectable features

Module configuration	Hollow fiber, plate and frame, spiral, tubular
Membrane area (m^2)	Up to 300*
Membrane material	Ceramic, polymeric
Operation mode	Continuous, recirculation
Flowrate (m^3/h)	1 – 5*
Pre-treatment	Activated carbon, disinfection, filtration
Post-treatment	Activated carbon, decantation, degassing, disinfection, ionic exchange
Hydraulic components	Manual or automatic valves, pipping, pumps, and tanks
Instrumentation and sensors	Conductivity, dissolved O_2, flow, ORP, pH, pressure, and temperature
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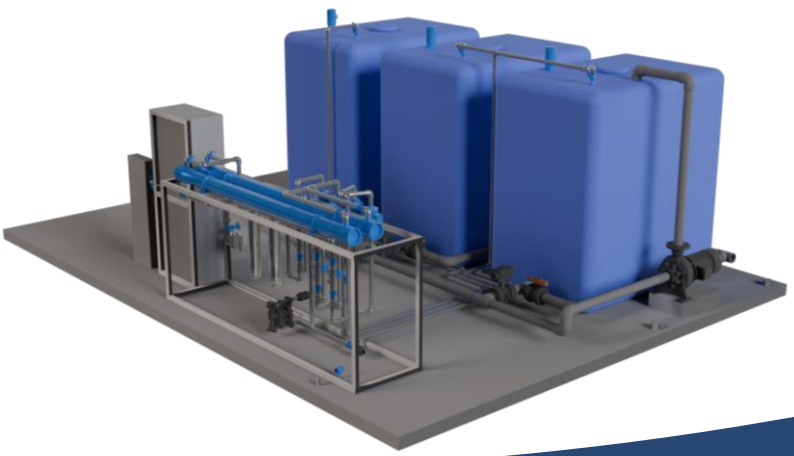

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OXIDATION & REDUCTION

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Installation, commissioning, training, and technical support services can also be provided to ensure proper implementation and operation.

The technology

We supply flexible pilot plants that can combine the following technologies:

Photochemistry

Electrochemistry

Photoelectrochemistry

Photothermochemistry

Ozone

Selectable features

Configuration*	Annular, cell, compound parabolic concentrator
Flowrate (m^3/h)	Up to 100*
Pressure (bar)	Up to 2.5*, photothermochemistry allows up to 15
Temperature (°C)	Up to 50, photothermochemistry allows up to 450
Operation mode	Continuous or recirculation
Pre-treatment	Activated carbon, disinfection, filtration
Post-treatment	Activated carbon, decantation, degassing, disinfection, ionic exchange
Hydraulic elements	Manual or automatic valves, pipping, pumps, and tanks
Instrumentation and sensors	Conductivity, dissolved O_2, flow, ORP, pH, pressure, radiation, and temperature
Temperature control system	Coil, heat cartridge, heat exchanger, heating mantle, jacketed tank, thermostatic bath
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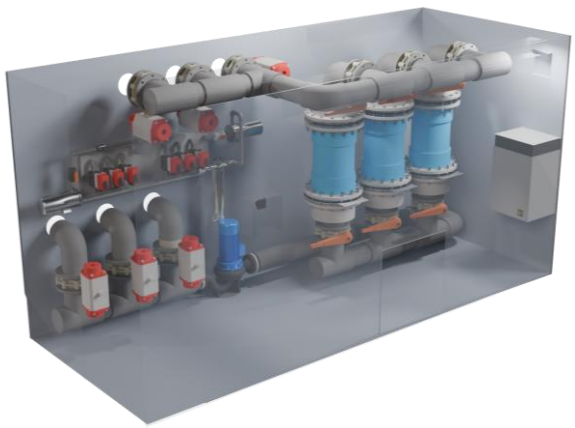

- Photochemical systems use **LED technology** with adjustable intensity and selectable wavelengths
- Electrochemical processes allow to work with a wide range of **areas, electrode materials, and geometries**
- Photothermochemical operation is possible under **elevated temperature** and/or **pressure** (up to 450 °C and 15 bar)

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