

Investigation into the Coupling of a Wave Energy Converter with a Reverse Osmosis Desalination Plant

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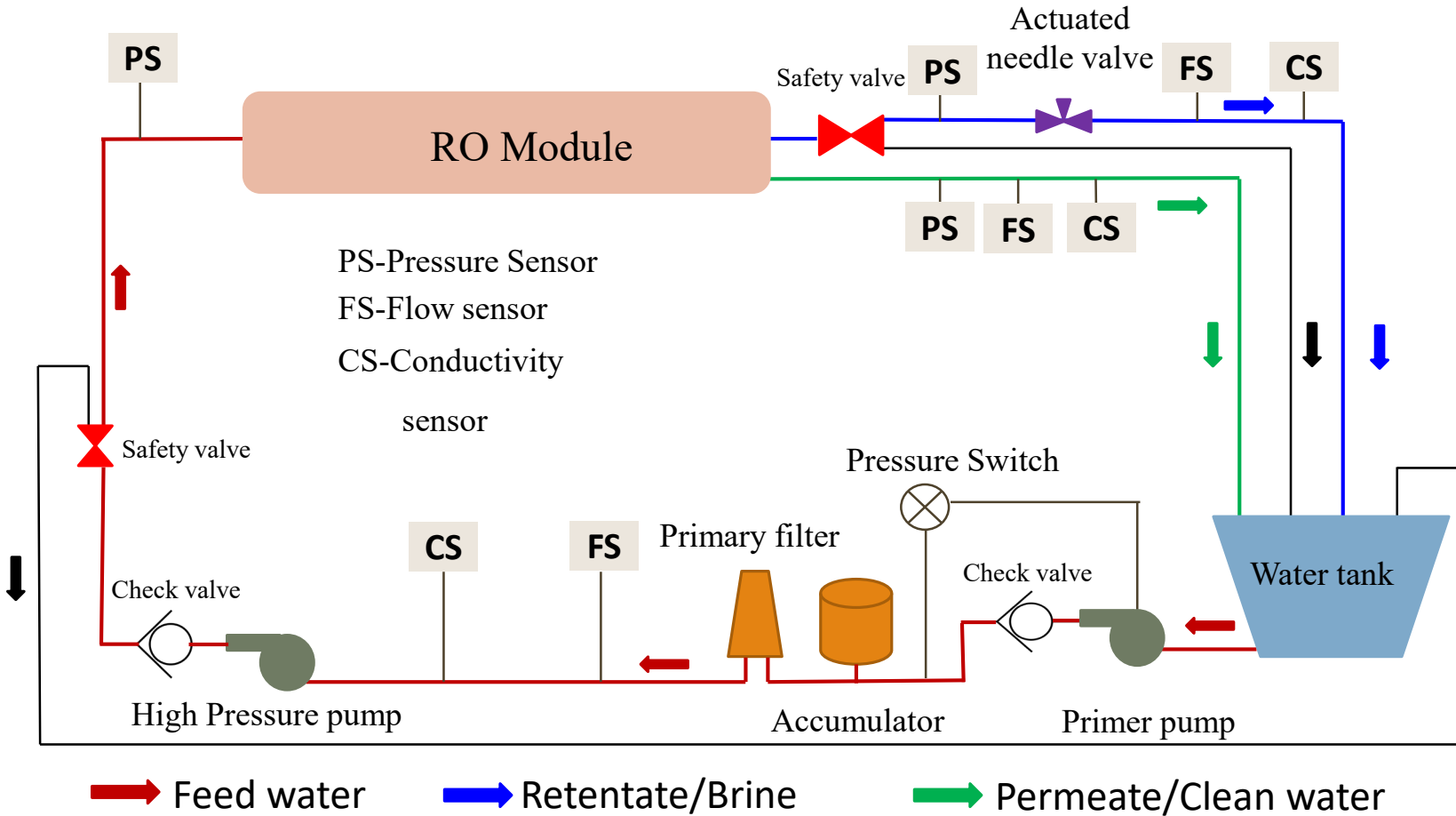
Wave powered desalination:

- Significant interest in the use of wave powered desalination
 - Wave energy technologies are suitable for reverse osmosis desalination plant
 - Coupling hydraulic PTO with reverse osmosis module reduce specific energy consumption

Project Activities and Objectives:

- Experimental
 - Understand how variable pressure/flow impacts RO plant water quality and specific energy consumption.
 - Understand how RO plant water quality and specific energy consumption may vary with membrane life due to variable pressure/flow.
- Numerical
 - Understand how the design of the wave energy technology influences the expected flow into the RO desalination plant.
 - Two wave energy converters selected: a point absorber and a surge converter
- Guidelines
 - Develop guidelines for wave-powered desalination plant design to minimize cost of water.

Schematic of the experiment setup:



Project outcome:

- Develop understanding
- Stimulate interest in deploying WEC technology for desalination
- Create road map for utility scale developments

Specifications:

- Max. feed flow rate: 32 L/min
- Max. pressure: 70 Bar

Controlling parameters:

- Speed of the high-pressure pump-controls the flow as well as pressure
- Position of the needle valve-controls the pressure