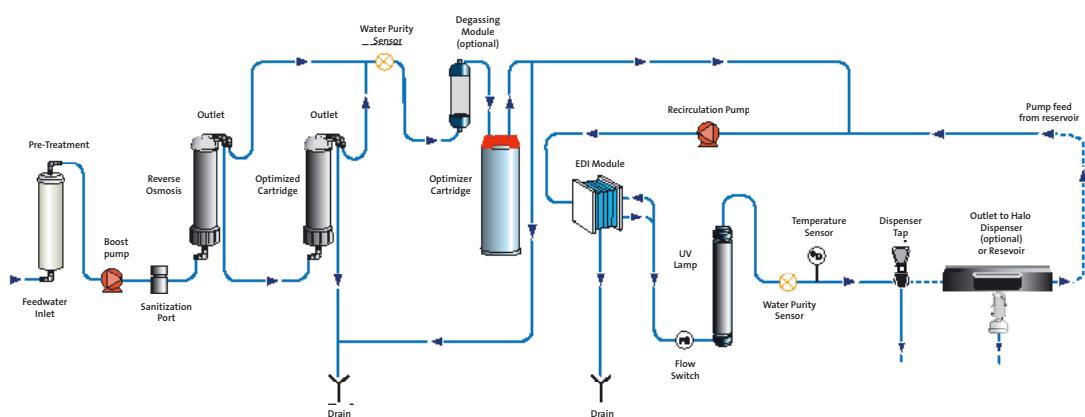


Technology Note 33

EDI Technology within the PURELAB[®] Chorus 2⁺ (RO/EDI/UV)

Electrodeionization (EDI) is an electrically-driven water purification process that involves Ion Exchange (IX) resins and Ion Permeable Membranes. Water enters the EDI module, where an applied current forces ions to move through the resins and across the membranes. These ions are collected into concentrated streams which can then be put to drain or be recycled. The deionized product water can then be used directly or undergo further treatment.

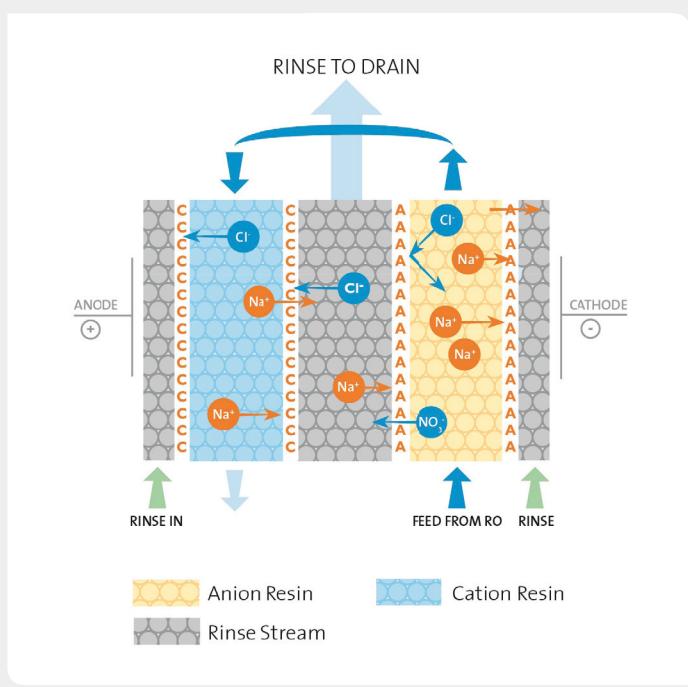


PURELAB Chorus 2⁺ (RO/EDI/UV)

The PURELAB Chorus 2⁺ (RO/EDI/UV) unit is equipped with patented recirculating EDI technology. The unit provides Type II⁺ purified water directly from a potable source. Feed water to the unit is pretreated through an activated carbon bed to remove Cl₂ and then is semi-purified by passage through reverse osmosis cartridges.

The water flows through the optimizer to remove any residual hardness before passing through the EDI module and the UV lamp. Water is then ready to be dispensed through a tap on the unit or is recirculated via a reservoir. Water from the reservoir is recirculated through the Pulse and the UV lamp to ensure high purity is maintained.

The features of ELGA's EDI module combined with those of the process in the unit give the best results for purifying and maintaining water purity.



Benefits of the PURELAB Chorus 2⁺ process

- During normal operation mode, the water from the reservoir is recirculated through the stack then through the UV lamp to guarantee purity. The unique position of the EDI module in the recirculation loop avoids the need to use a final deionization pack. The unit specification is $>10 \text{ M}\Omega\text{.cm}$ but the product water from the unit can easily reach $>15 \text{ M}\Omega\text{.cm}$.
- The dilution of feed-water (RO permeate) with water from the reservoir as it recirculates through the purification technologies ensures that the EDI module always operates under optimum conditions and enables it to effectively deionize short-term episodes of poorer quality feed-water without significantly reducing product purity.
- An optional degasser within the unit will ensure the suitability of PURELAB Chorus 2⁺ even in areas with very high CO_2 in the feedwater
- As a result of the nature of an EDI device and the continually regenerated resins, the environmental footprint is greatly reduced as less consumables are sent to waste.
- Lower running costs than conventional systems using disposable resin cartridges.
- There is no need for a point-of-use microfilter due to the combined technologies in PURELAB Chorus 2⁺ (RO/EDI/UV) which deliver a bacterial specification of $<1 \text{ CFU/ml}$.

Benefits of the EDI Module

- The unique internal design and process features a series of anion, cation and mixed bed resin compartments that (well known in the industrial water purification industry) is an optimum arrangement to produce ultrapure water.
- Due to the intrinsic nature of an EDI device, resins are continuously regenerated by the current and are never exhausted. The benefit is the absence of the adverse effects given by exhaustion of a resin bed, such as silicon, boron or organic breakthrough. Water purity is always consistent and maintained.
- The EDI module within the PURELAB Chorus 2⁺ (RO/EDI/UV) is energy efficient, typically operating at less than 14VA (14 watts).

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