

Enapter Service Bulletin

25.08.2023

Water Requirements

Dear Customers,

We would like to share the results of our most recent study on our AEM devices. After conducting a comprehensive analysis, we observed that improving water quality is crucial to reducing maintenance frequency and costs while ensuring a consistent performance of the system.

Therefore, we are updating the minimum input water purity requirements for all our AEM Electrolysers. The current water purity input (<20 $\mu\text{S}/\text{cm}$ conductivity) will be replaced to comply with ASTM standard D1193-06 (Type IV or lower). In Addition to this standard, minimum requirements for Total Organic Carbon (TOC), Silica and Acidity are now set for our AEM electrolysers.

Below you will find a visual interpretation of the current change:

Measurement (Unit)	Type I	Type II	Type III	Type IV	Previous Enapter Requirements
Conductivity ($\mu\text{S}/\text{cm}$)	< 0.056	< 1	< 0.25	< 5	< 20
Resistivity (M Ω -cm)	> 18	> 1	> 4	> 0.2 (200K Ω)	-
Total Organic Carbon (TOC) ppb or $\mu\text{g}/\text{L}$	< 50	< 50	< 200	< 1000*	-
Sodium (ppb or $\mu\text{g}/\text{L}$)	< 1	< 5	< 10	< 50	-
Chloride (ppb or $\mu\text{g}/\text{L}$)	< 1	< 5	< 10	< 50	-
Silica (ppb or $\mu\text{g}/\text{L}$)	< 3	< 3	< 500	< 500*	-
Acidity (meq/l) <i>according to ASTM D1067</i>	< 0.1*	< 0.1*	< 0.1*	< 0.1*	-

*Not part of ASTM D1193-06 standard but required by Enapter devices.

Standards used from [ASTM](#):

- ≡ ASTM D1193-06 (water types)
- ≡ ASTM D1067 (acidity)

Our documentation (datasheets, manuals, handbook.enapter.com etc.) will be updated to reflect these new requirements within the next weeks.

Warranties for all AEM Electrolysers for which a purchase order has been received on or before the date of this communication shall not be impacted by the updated minimum input water purity requirements. However, wherever possible, it is strongly recommended to adhere to the updated minimum input water purity requirements.

Q&A

How can we expect this change to impact our maintenance requirements?

After a thorough experimental campaign to assess the impact of several chemical elements and compounds that could be found in purified water, Enapter has verified that the electrolyte lifetime can be extended if the de-ionized water respects the ASTM types and the additional requirements listed in the user manual. The electrolyte replacement is still planned to be performed once a year.

If you have not experienced the necessity to replace the electrolyte before the planned yearly maintenance, it probably means that your water purification system is already respecting the new water requirements.

Do you have any advice for sizing and selecting an appropriate water purification system, and what kind of monitoring should be used to ensure the water quality stays within specification across an EL lifecycle?

- Before choosing a water purification system (WPS), it's essential to assess your local water supply for potential contaminants.
- For a reliable solution, a combination of reverse osmosis (RO) and resin filtration is commonly recommended. To enhance robustness, opting for RO along with two resin filters in series is advisable.
- To prevent the sudden release of large amounts of adsorbed CO₂, it's recommended to incorporate conductivity monitoring between the two resin filters. When the conductivity between the filters surpasses 5 µS/cm, it's time to switch the filters and replace or regenerate the original resin filter.