There are 5 containers that each contain a water treatment technology. The containers are modular and thus can be operated as a stand-alone unit or connected to each other in a treatment train. A UV disinfection unit can be connected to each of the containers. Also, there is the option to connect the effluent to a final buffer tank (2 m³ on a skid + mixing + sensors), which can regulate the effluent flows to a certain ratio or conductivity.

The experimental setup of the containers allows remote operation and continuous monitoring of critical parameters, including temperature, pH, conductivity, turbidity, and chloride. The robust local PLC-based control level is complemented with an IIoT Edge gateway with a double purpose: it enables secure remote access to all HMIs from a central operating system and makes reliable data acquisition towards the cloud possible.

An overview of the power supply and electrical data that is the same for all the containers is given beneath.

|  |  |
| --- | --- |
| Power supply and electrical data (all containers) | |
| Power supply voltage | 400 Vac |
| Power supply frequency | 50 Hz |
| Power supply phases | 3P + N + PE\* |
| Power supply connection | CEE 5 pin male 32A |
| Power supply net type | TN-S |
| Short circuit current rating | 10 kA |
| Control voltage | 24 Vdc |
| Max power supply cable length (10 mm²) | 60 m |
| Max power supply cable length (16 mm²) | 89 m |

\*3 fasensysteem, neutral draad en beschermende aarde



MMF



UF

In/out

Out/in



dNF

+ cfUF



ACF



RO + CCRO

### Ultrafiltration (UF-3-2)

|  |  |
| --- | --- |
| Power supply and electrical data (specific for UF) | |
| Total installed power | 11.57 kW |
| Full load current | 25.74 A |

##### Description

Ultrafiltration is a type of membrane filtration that separates particulate matter, colloids, (part of) microorganisms and virus from soluble compounds. It does not remove dissolved solids. UF has pore sizes in the range of 0.001 to 0.1 micron, with a 0.03 nominal micron rating being typical. Ultrafiltration is a good separation technology for desalination pre-treatment, RO pre-treatment, and wastewater reclamation, as well as for producing potable water. In this pilot two types of UF membrane configuration can be tested, IN/OUT or filtration OUT/IN filtration, depending on the water stream characteristics. They are operated **separately**.

##### A room with several cylinders Description automatically generatedConnections

* Inlet: service water, compressed air, feed water
* Outlet: waste out non-chemical (pressurized), waste out chemical (pressurized), draining feed tank, product water out 1.
* Chemicals:
  + Acid: H2SO4 50%, H3PO4 30% or C6H8O7 50%
  + Base: NaOH 30%
  + Oxidant: NaOCl

##### Monitoring parameters

* Prefilter: inlet & outlet pressure
* Feed: pH, temperature, tank level, turbidity, conductivity, CIP heater temperature.
* Filter: filtration flow, backwash flow, trans-membrane pressure.
* Filtrate: turbidity, temperature, conductivity, chloride, tank level, transfer pressure, product out flow.

##### Dimensions and weight

|  |  |
| --- | --- |
| Size container (L x W x H) | 610 x 244 x 289 cm |
| Weight container | 4500 kg |

##### Process data

|  |  |  |
| --- | --- | --- |
|  | Unit | Value |
| OUT/IN membrane module: DuPont Integraflux SFD-2860XP | | |
| Membrane area | m² | 51 |
| Feed flow rate | m³/h | 1 – 3.5 |
| Design recovery | % | 80 – 95 |
| Net filtration flux | LMH | 15.7 – 55.9 |
| Design TMP | Bar | 0.3 – 2.1 |
| Backwash air scour flow | Nm³/h | 12 |
| Backwash flux | LMH | 100 |
| IN/OUT membrane module: Inge dizzer 5000plus WR | | |
| Membrane area | m² | 50 |
| Feed flow rate | m³/h | 1 – 3.5 |
| Design recovery | % | 80 – 95 |
| Net filtration flux | LMH | 16 - 57 |
| Design TMP | Bar | 0.1 – 1.5 |
| Max rate of pressure change | Bar/sec | 0.5 |
| Backwash flux | LMH | 230 |