

Presentation

Cleaning in place (CIP)

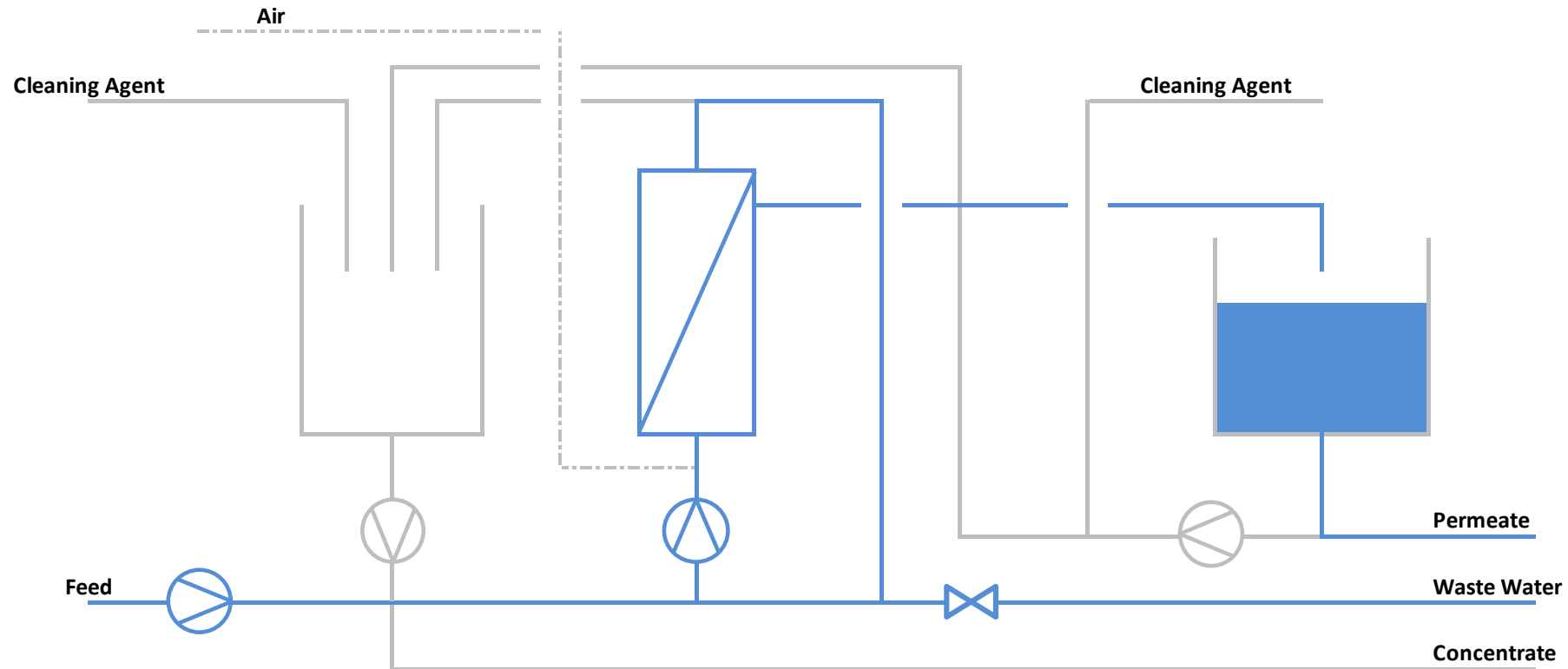
Lehmann&Voss&Co. KG

Alsterufer 19

20354 Hamburg

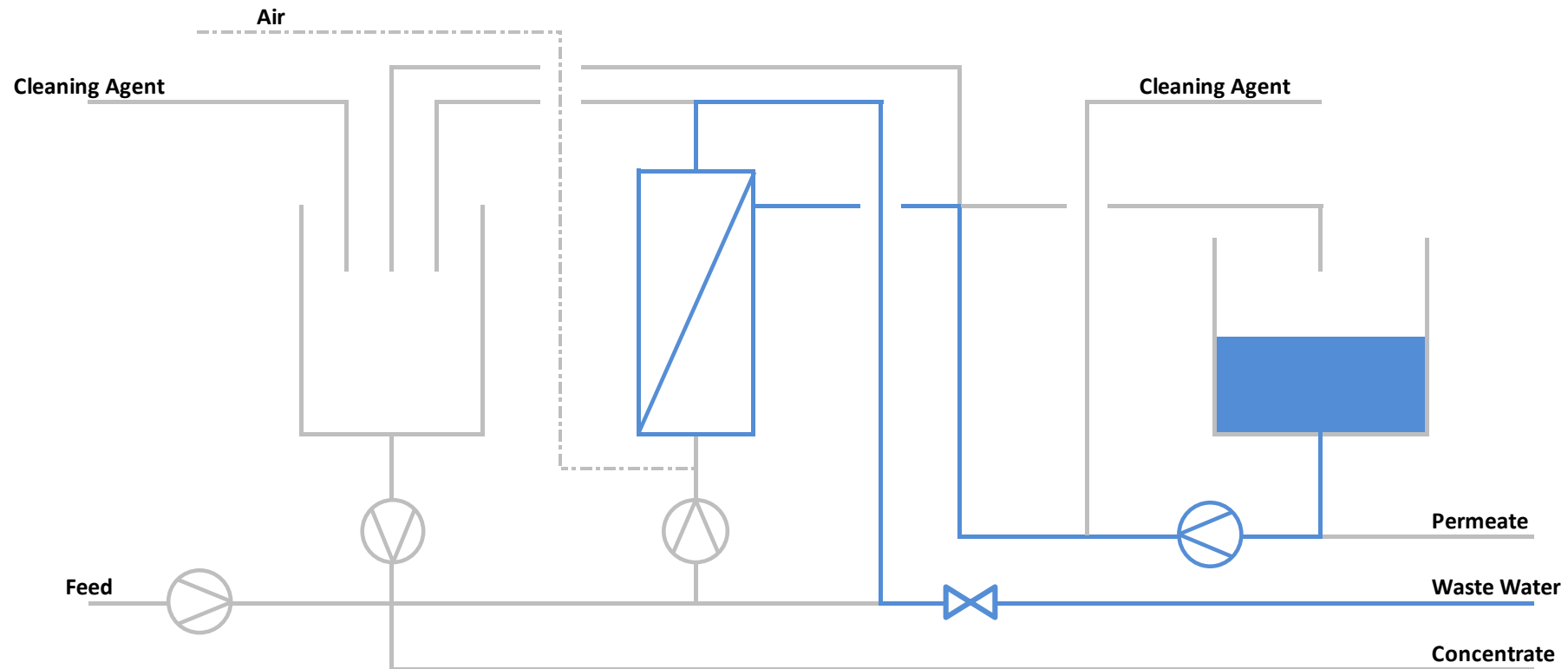
Established Technology for future challenges

1 - Cross Flow Filtration



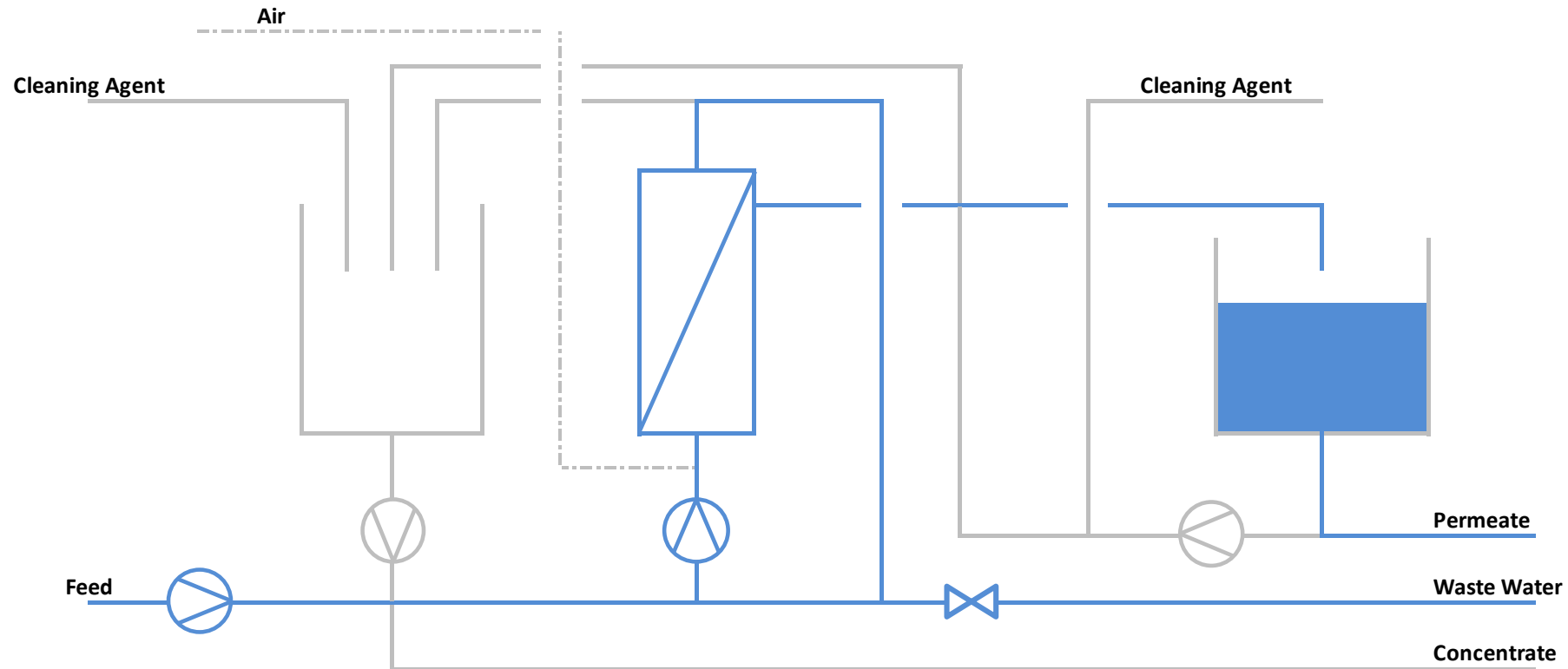
- Filtration in Cross-Flow mode. Permeate is discharged via the permeate tank.

2 – Permeate Backwash



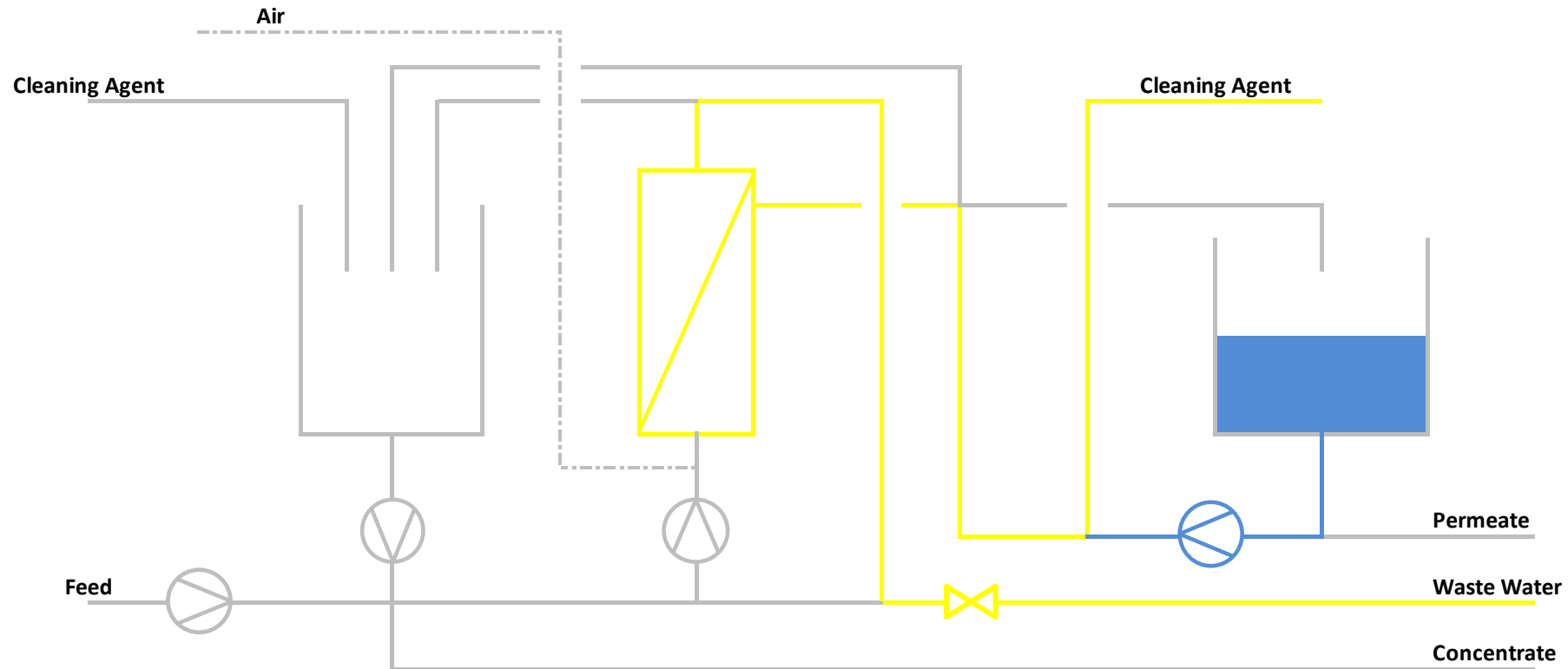
- Permeate is pumped from the permeate tank via back wash pump through the membrane in reverse direction.

3 – Cross Flow Filtration (rinsing after cleaning)



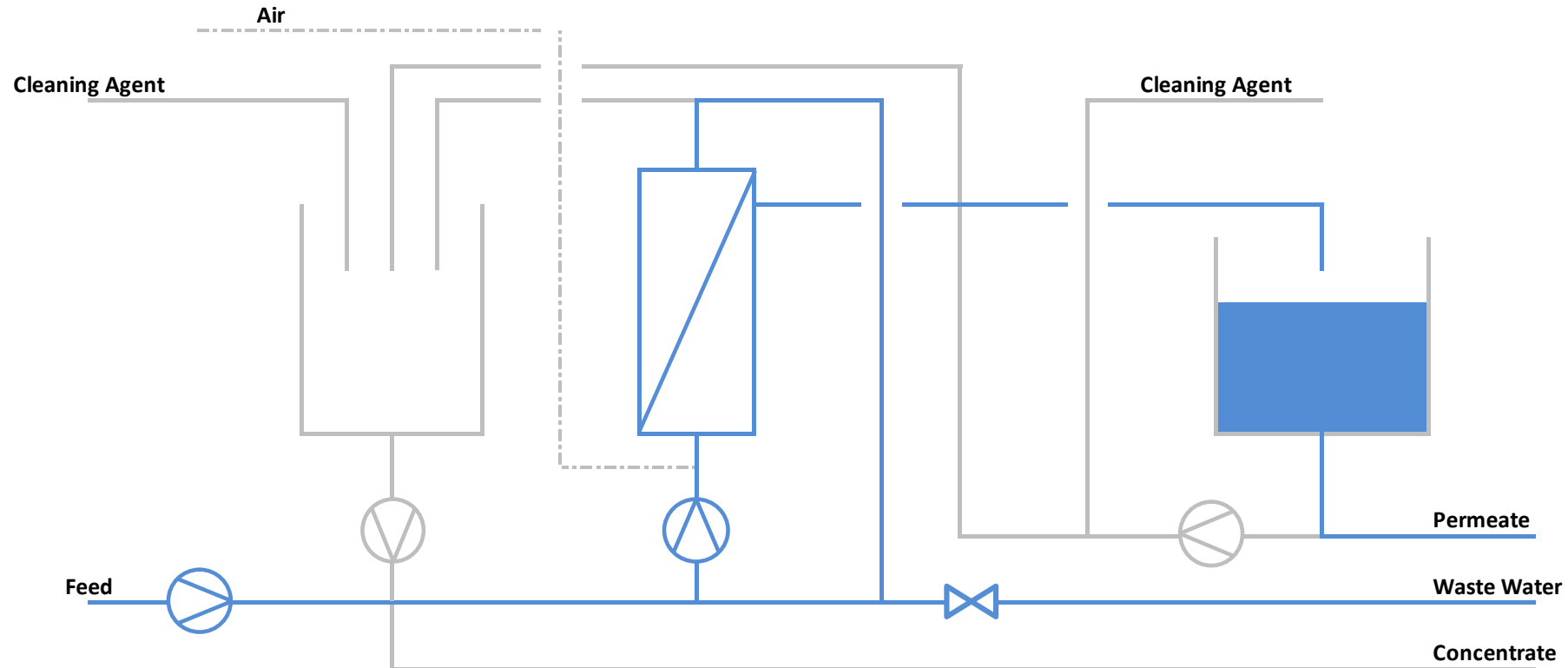
- Filtration in Cross-Flow mode. Permeate is discharged via the permeate tank.

4 – Chemical Enhanced Backwash (CEB)



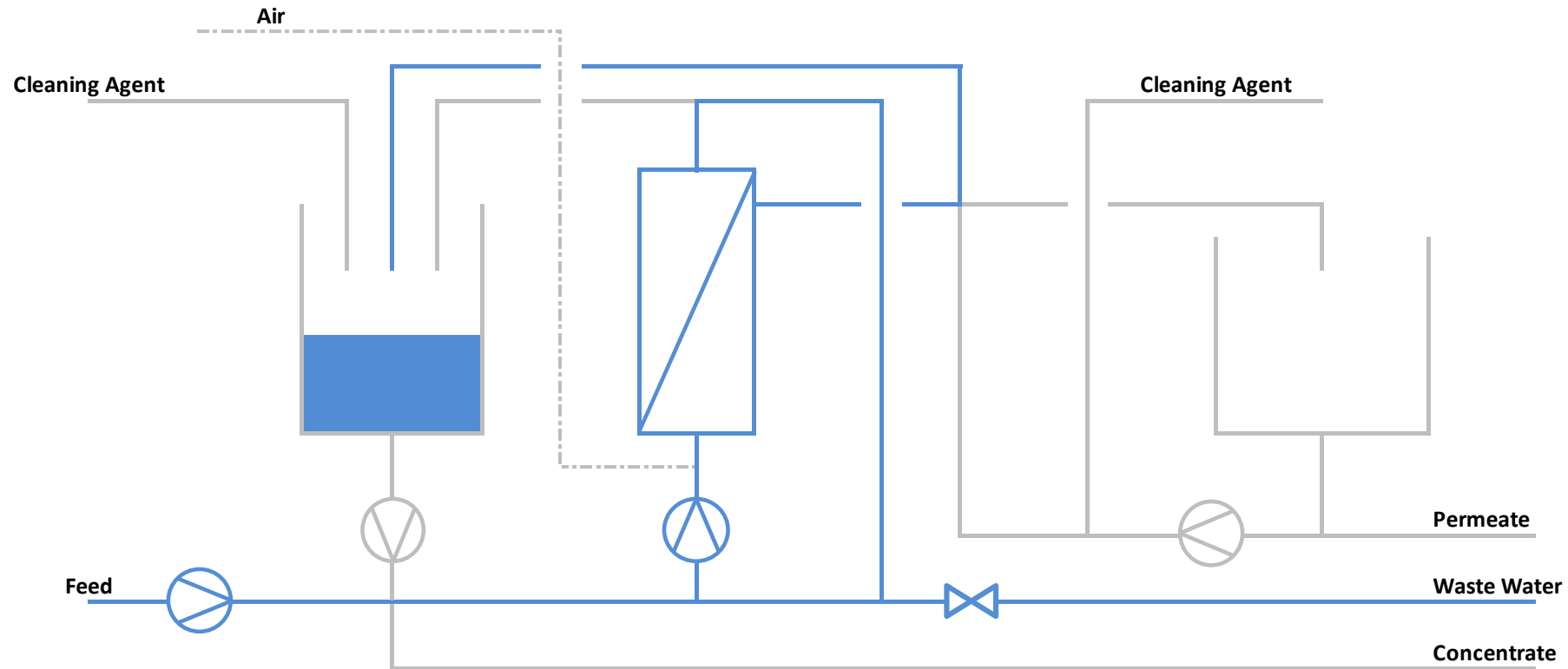
- Permeate is pumped from the permeate tank via back wash pump through the membrane in reverse direction.
- Cleaning chemicals are dosed in the permeate water stream (yellow)

5 – Cross Flow Filtration (rinsing after cleaning)



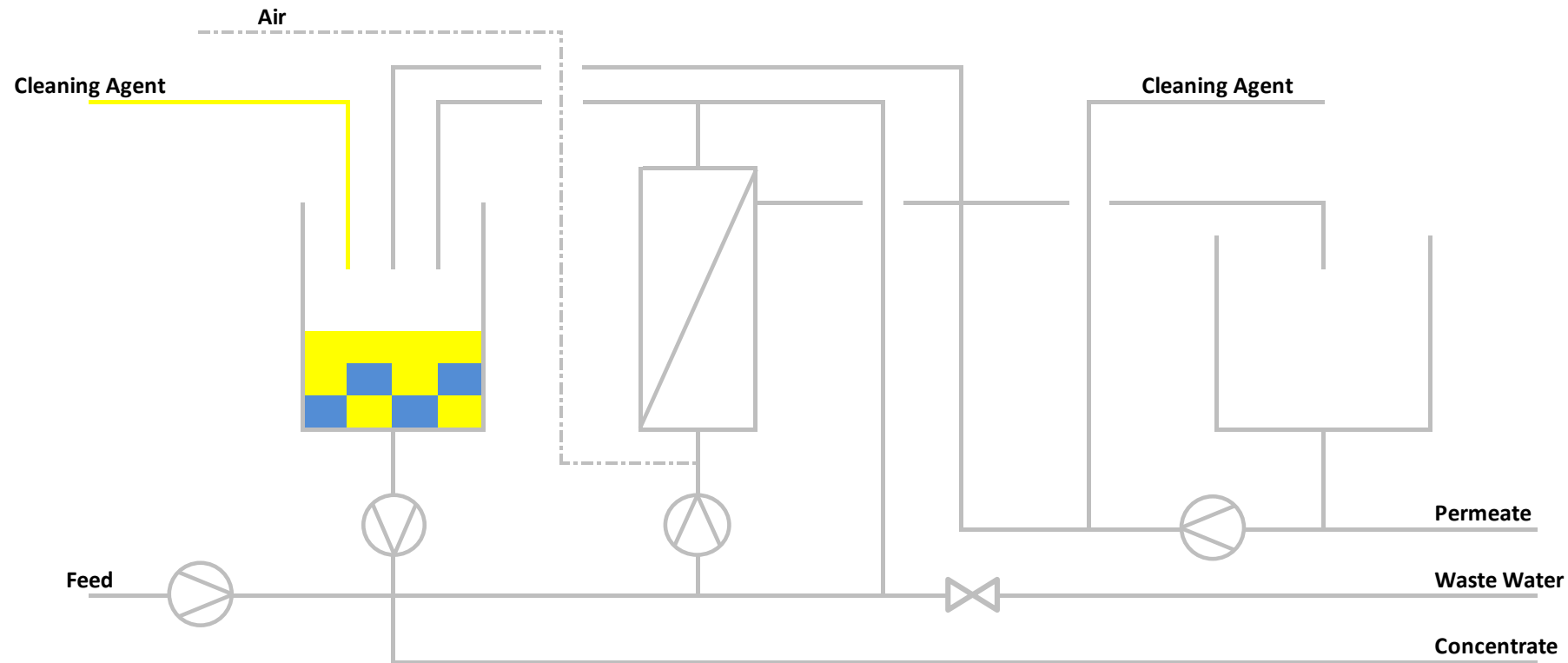
- Filtration in Cross-Flow mode. Permeate is discharged via the permeate tank.

6 – Cleaning in place (CIP) – Tank Filling



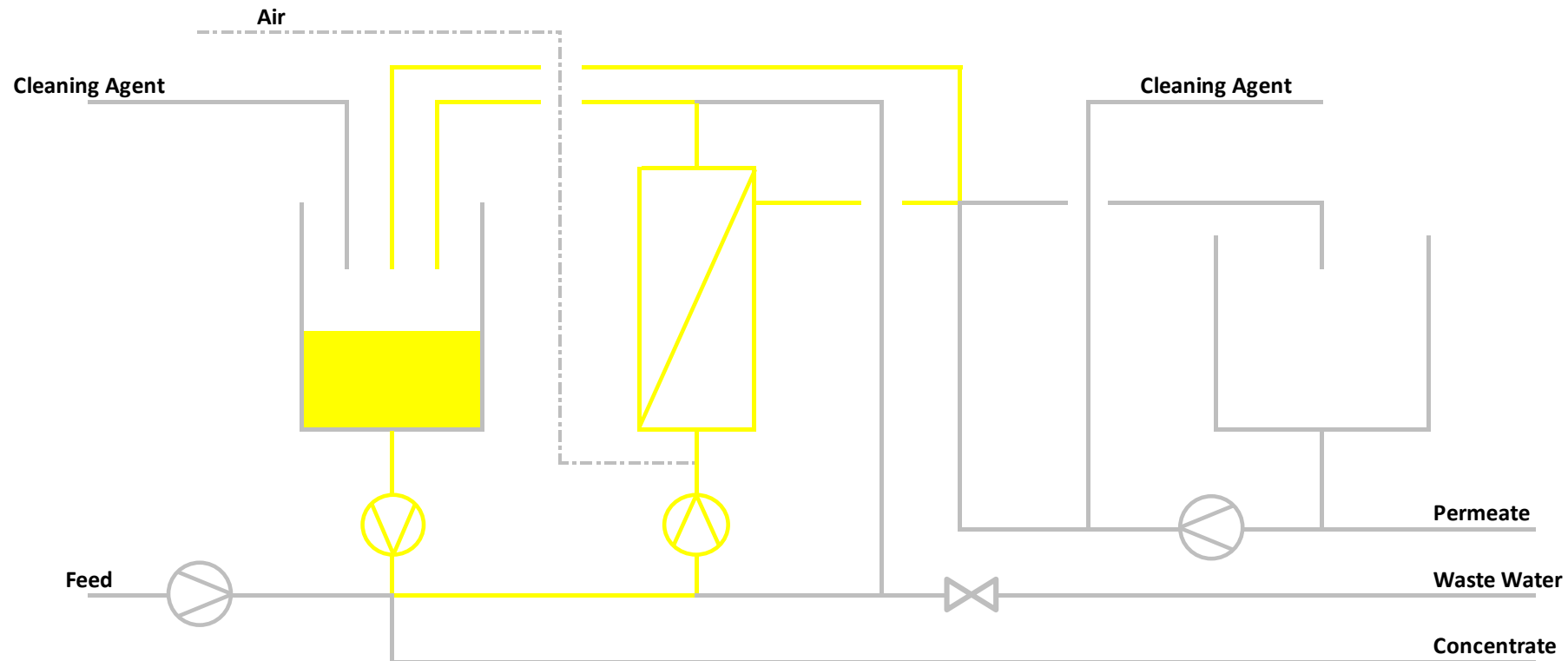
- Filtration in Cross-Flow mode. Permeate is led to the cleaning tank.

7 – Cleaning in place (CIP) – Cleaner Dosing



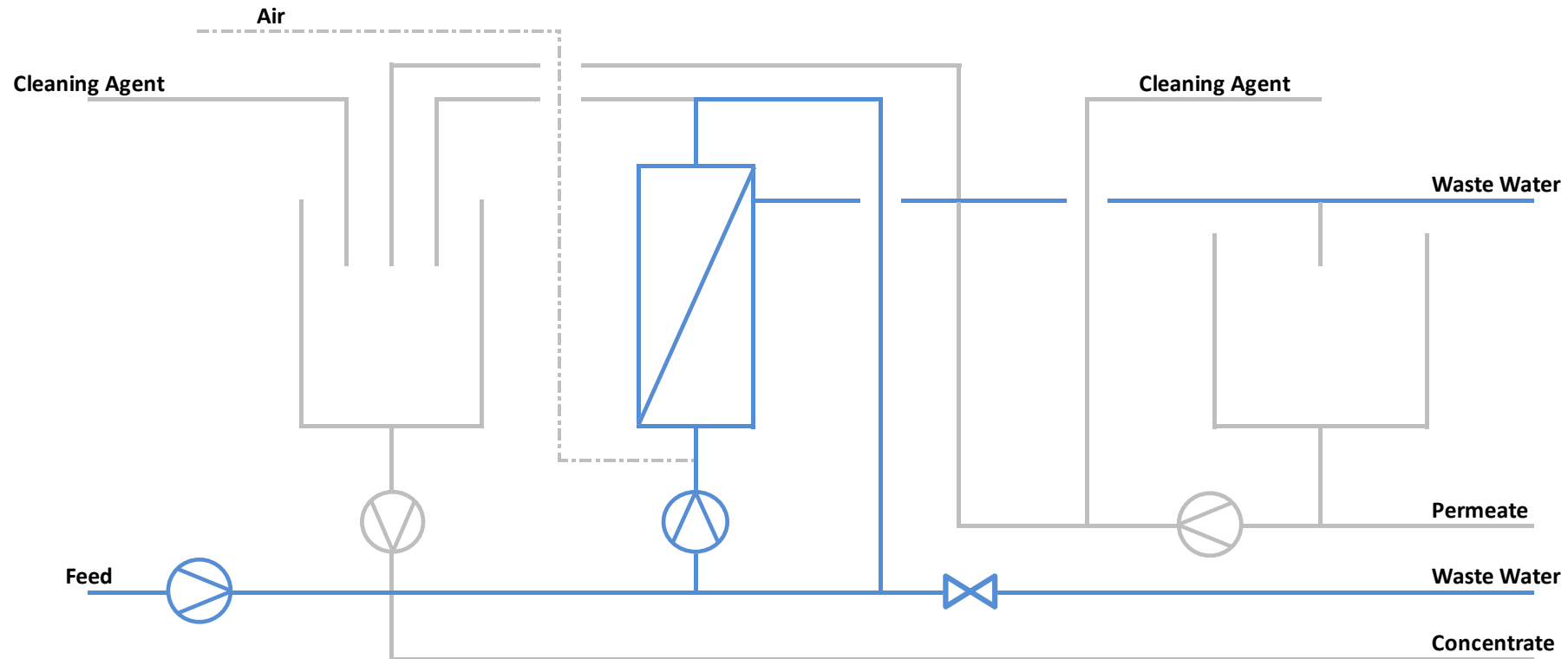
- Chemicals are dosed in the cleaning tank. Dosing is controlled either by cleaner concentration or pH value.

8 – Cleaning in place (CIP) – Intermittend Cross Flow Cleaning



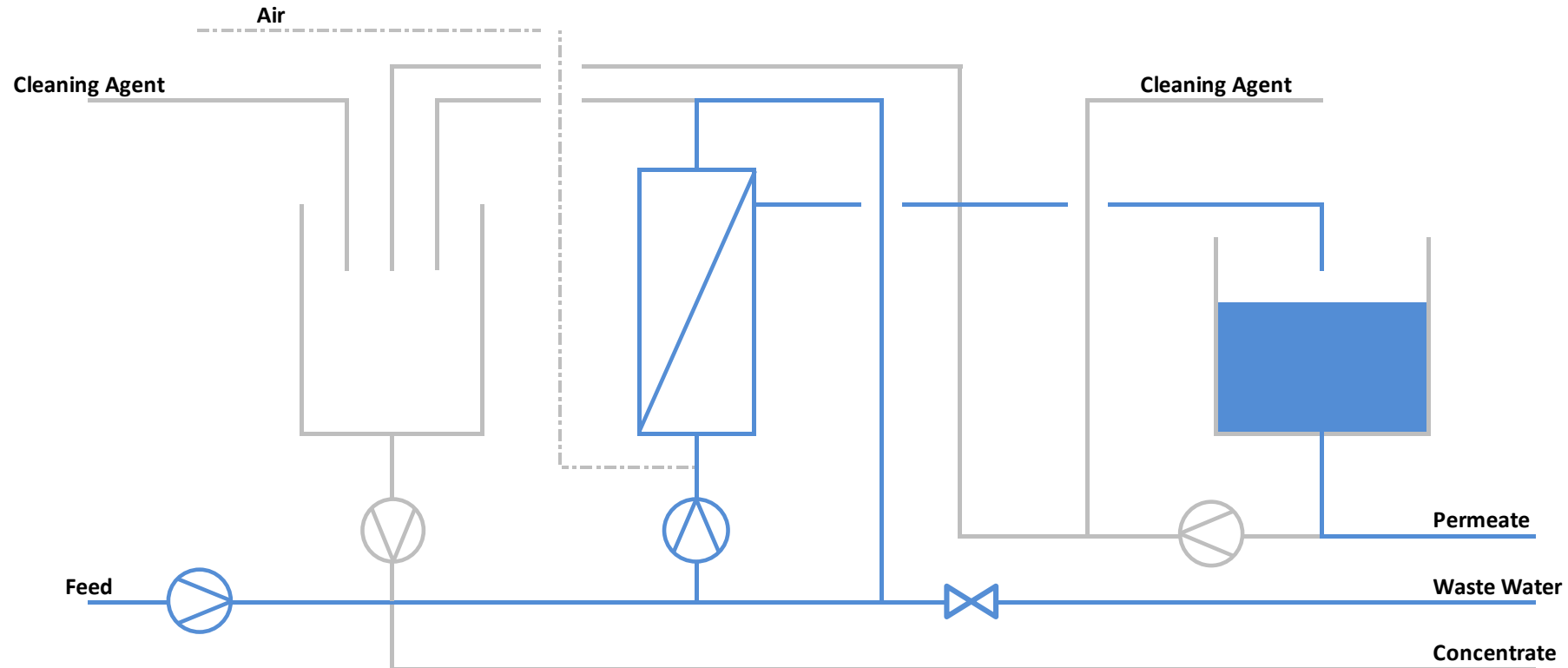
- Cleaning solution is pumped (intermittend) through the module without pressure and both streams are led back to the cleaning tank.
- Although there is no operating pressure applies, small amount of cleaner/water will pass the membrane.

9 – Cleaning in place (CIP) – Cleaner Discharge (rinsing after cleaning)



- Filtration in Cross-Flow mode. Permeate is discharged to waste water until all chemical are flushed out of the system.

10 – Cross Flow Filtration (rinsing after cleaning)



- Filtration in Cross-Flow mode. Permeate is discharged via the permeate tank.



Cleaning Agents

- Organic fouling - caustic (NaOH); sodium hypochloride (NaClO)
- Inorganic fouling - acidic (HCl, H₂SO₄)
- Proteins, Biomass - enzymatic
- Iron fouling - complexing agents (citric acid)

Note

- Acid (<pH 7) - closes membrane
- Caustic (>pH 7) - opens the membrane (last rinsing with caustic and water)



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The consequence of experience of
a successful business model.

Established Technology for future challenges