

CIP miniplant

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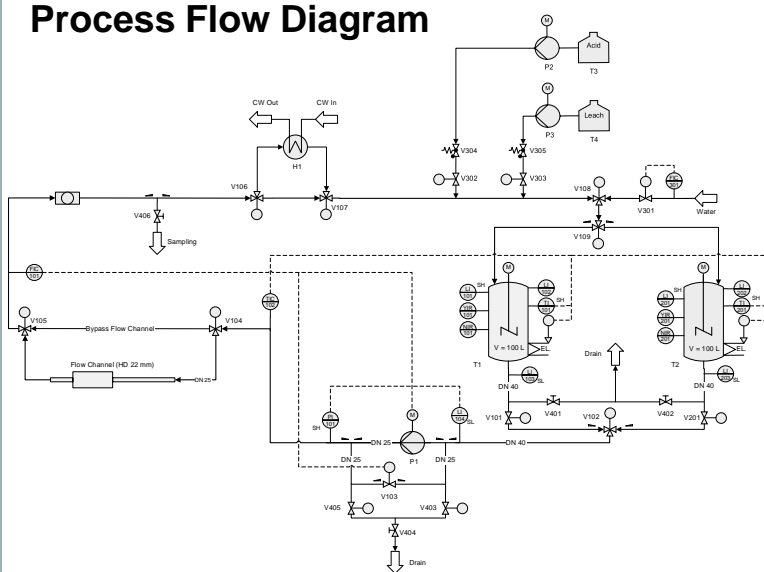
System Data

- Pilot plant to perform Cleaning-in-Place (CIP) experiments inside a modular flow channel (HD: 22 mm)
- Exchangeable lid and base plate
- Pilot plant supports a wide parameter range regarding flow rate, temperature and pH-Value

Photograph



Process Flow Diagram



Substance Systems

- Whey protein concentrate (WPC)
- Simulated milk ultra filtrate (SMUF)
- Sodium hydroxide (diluted)
- Phosphoric acid (diluted)

Test rig

- Two storage tank exhibits a volume of 90 L
- Immersion heaters and heat exchanger for continuous heating/cooling
- Volume flow controlled frequency converter allows steplessly variable pump settings
- Flow channel bypass allows a continuous (pre)-heating of the test rig
- Sensors for the continuous measurement of pH-value and conductivity, gauge glass, sampling spot
- Automatized dosing of e. g. acid/leach
- Multiple temperature sensors (tanks, before/after the flow channel)

Operation Range

Process parameter	Unit	Range
Volume flow	m ³ /h	0.6 ... 4
Flow rate	m/s	0.3 ... 1.9
Reynolds number	-	$4.9 \cdot 10^3 \dots 1.3 \cdot 10^5$
Absolute pressure	bar	1 ... 7
Temperature	°C	RT ... 90
pH-Value	-	1 ... 13