Reduce Maintenance Costs – CIP Cleaning 4.0!

Optimise CIP cleaning in the bewerage industry

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Agenda

- CIP-Cleaning
- Requirements regarding material and installation
- Stand-alone solution
- Benefits during the CIP-Cleaning

CIP-Cleaning

CIP-Cleaning

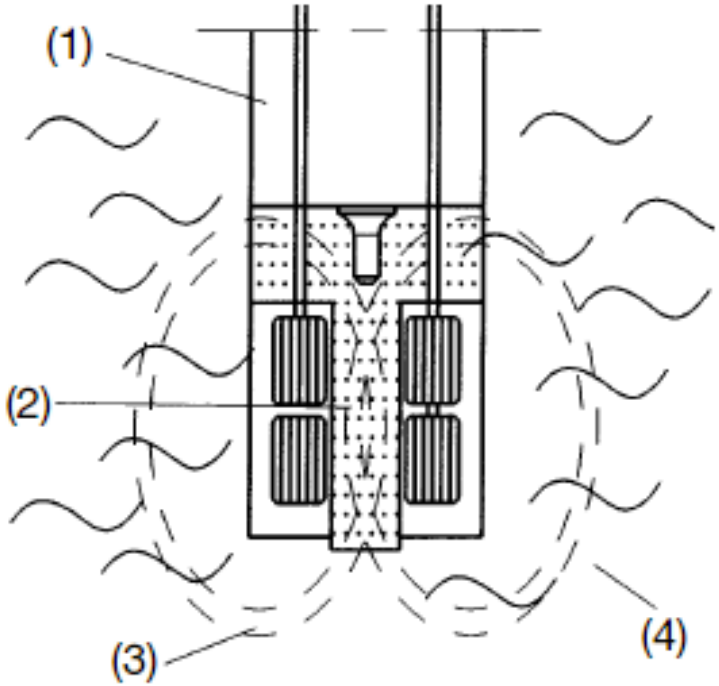
- Standard cleaning method in the beverage industry
- Precise combination of factors chemistry, temperature, mechanics and time
- Cost reduction of cleaning agents, water, sewage and energy

Important Measurand – Inductive Conductivity

- Adjusting the concentration of acid and sodium hydroxide
- Monitoring the degree of contamination of the cleaning agent.
- Monitoring of the residual concentration of acid and sodium hydroxid in the return flow
- Detecting the phase separation

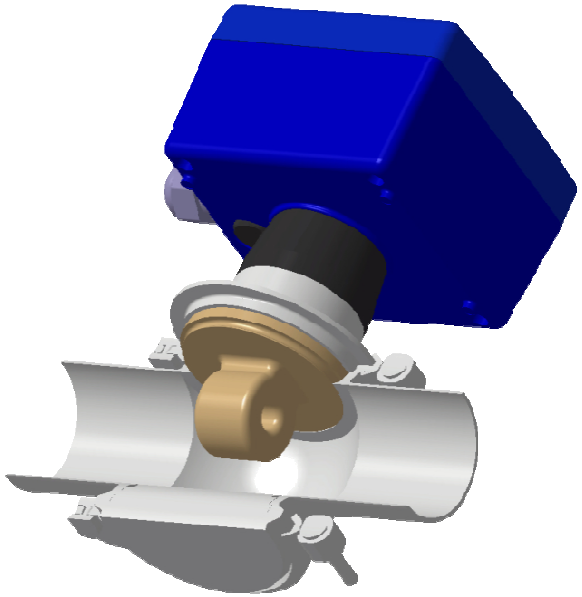
Inductive conductivity measurement

1. Plastic housing
2. Flow Channel
3. Flow loop
4. Measuring liquid



Inductive conductivity measurement

- Benefit of this sensor is
  - Low maintenance costs
  - Sensor has no direct contact to the liquid
  - No measuring error through polarization effects
  - Suitable for polluted liquids



More than sensors + automation

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Requirements regarding material, design and installation

Material requirements

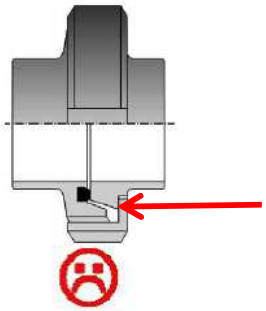
- Plastics and sealing materials suitable for the use in foods and drugs (FDA 21CFR177.2600)
- Surface roughness in pipes and tanks Ra<0,8µm for the food industry
- Stainless steel 316 L with 3.1 certificate

Design-requirements for sensors

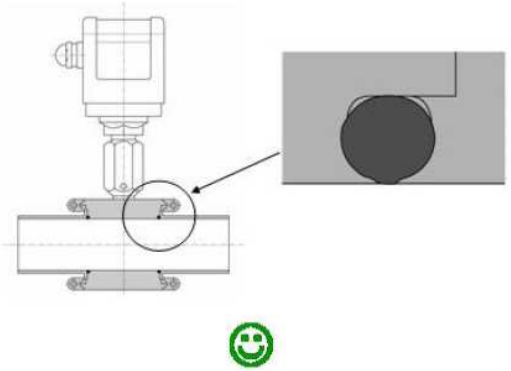
- Qualified materials
- Avoiding slots, corners, holes, cavities and dead legs
- Easy to clean
- Use FDA approved seals
- The surface should be electro polished
- Sensors have to be calibrated (Calibration certificate is available)
- Hygienic certified process connections

Installation reqirements and recommendations

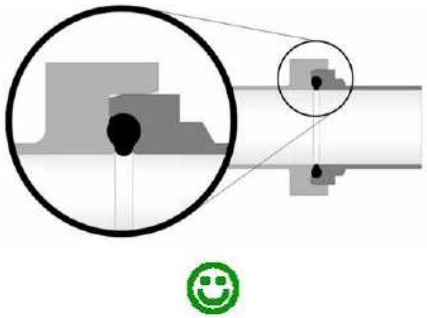
- Example for a sealing
- Picture 1: the sealing for a milk pipe connection =>dead space
- Picture 2 and 3: Here the sealing fills the complete room from (no hygiene risk)



Picture 1



Picture 2



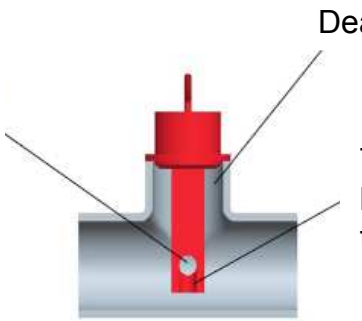
Picture 3

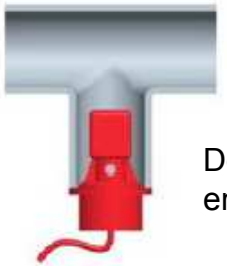
Picture source: Hygienic Design
Weihenstephan; Dr. Ing. Jürgen Hofmann

Installation reqirements and recommendations

- Example: Installation of a inductive conductivity sensor

The bore hole is counter to the flow direction





Dead space, not self emptying

Picture source: Hygienic Design
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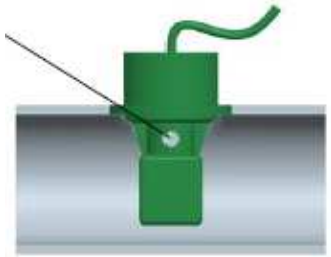
Installation reqirements and recommendations

- Example: Installation of a inductive conductivity sensor



Picture source: Hygienic Design
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Example:
Stand-Alone Solution

Stand-Alone Solution – Industry 4.0!

- Small CIP-plants
- Easier and faster to handle with the PLC

- All measurands can be measured, controlled and registraded fwith this multichannel measuring device
- Reliable process for all measurands with all datas
- Calibration-, and washing timer with alarm funktion

Stand-Alone Solution

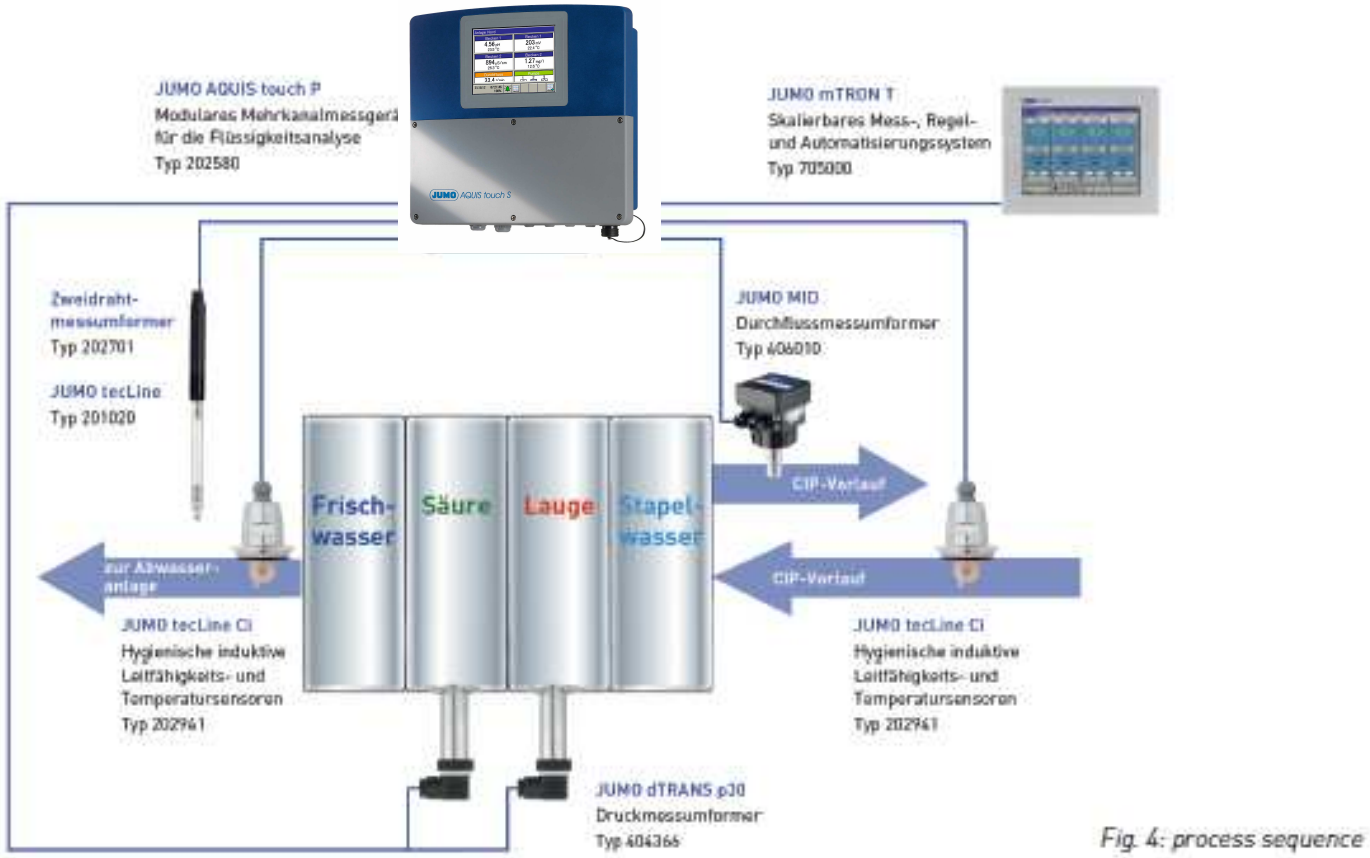

Fig. 4: process sequence

Benefits during the CIP-Cleaning

- Large measuring range 100µS-2000mS
- Reliable measurement also in polluted liquids
- High process safety through hygienic design
- Nearly free of maintenance costs
- Save rources costs regarding of a fast and clean phase separation

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Thank you for your attention!

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