Measurement, control, regulation and operational monitoring

Within 30 minutes, the team must demonstrate their competence in the following areas on various test rigs and in operational analysis:

- Assembly and commissioning of a test facility
- Monitoring the operation of a wastewater treatment plant (operational analysis)
- Adjustment of sensors on a test facility
- Troubleshooting on a test facility
- Various body and surface calculations

Three subtasks, each lasting 30 minutes.

Five minutes of preparation time is allowed before the start of the competition. During this preparation time, the team may read through the tasks and inspect the work area. There must be no communication between team members, nor may any work be carried out.

SAFETY INSTRUCTIONS

Personal protective measures and rules of conduct
Always use your personal and the available protective equipment!

- Hand protection: Wear work gloves
- Eye protection: Use safety goggles
- Body protection: wear suitable protective clothing
- Foot protection: Wear safety shoes

The following PPE must be brought along:

- Safety footwear
- Work clothing: trousers and jacket
- Mechanic's gloves
- Lab coat
- Safety goggles

Existing PPE:

- Lab gloves

Hygiene precautions and rules of conduct
Do not consume food or beverages while handling the product. Do not store food or beverages in the work area or storage room.

General electrical safety instructions

- Only carry out work on electrical connections when they are de-energized!
- Ensure correct polarity when connecting certain electrical components, especially sensors. These components may be destroyed in the event of reverse polarity or short circuit.
- Do not pour water over electrical components. If this happens accidentally, switch off the power supply immediately. The entire system must be checked for possible damage by an expert.

Test facility safety instructions

- Fill the lower container when it is de-energized!
- Do not exceed the maximum permissible operating pressure of 0.5 bar for the liquid in the pipes, tanks and sensors.
- Never allow the pump to run dry.
- Empty the liquid from the system by opening the drain valve.

Pneumatic safety instructions

- Do not exceed the maximum permissible pressure of 800 kPa (8 bar).
- Do not activate the compressed air until all those connections are plugged in and secured.
- Never disconnect the hose under pressure.
- When working with a knife, never touch the cutting edge.
- Wear suitable hand protection.

Operational analysis Safety instructions
<u>Danger to humans</u>

- Chemicals

- Products cause severe burns to the eyes, skin and mucous membranes
- Irritates the eyes, respiratory organs and skin
- Irritates the eyes, respiratory organs and skin
- Powder is toxic if swallowed

<u>Technical protective measures and rules of conduct</u>

- Use only in well-ventilated areas. Do not inhale vapours/dust
- Never add water to LCKW 820

1st sub-task:

Assembly and commissioning of a test facility

1 person – 30 minutes

Participants set up a test facility and commission it. Participants set up the test facility, attach the sensors, commission and adjust them, and document the measured values. Various body and surface area calculations can also be queried.

Work equipment

Available work equipment:

- Edu Kit Advanced
- Laptop
- Basic tools
- Formula collection for environmental engineering professions DWA

Literature/References/Internet:

https://www.adiro.com/de/lern-forschungssysteme/hardware/edukit-pa.php

https://www.adiro.com/de/service/faq/lernsysteme-faq-zu-edukit-pa.php

Images

Part 2:

Operational monitoring of a wastewater treatment plant

1 person – 30 minutes

The participant must be able to measure an unknown disturbance variable from a water or wastewater sample and evaluate it. The analysis is carried out using a cuvette test and photometer. In addition, the participant must be able to produce a dilution series, whereby the calculation for this must be carried out independently. The results must be documented in Excel and presented as a diagram.

Work equipment

Available work equipment:

Laboratory materials

Possibly a formula collection for environmental engineering professions

Literature/references/internet:

https://de.hach.com/lck