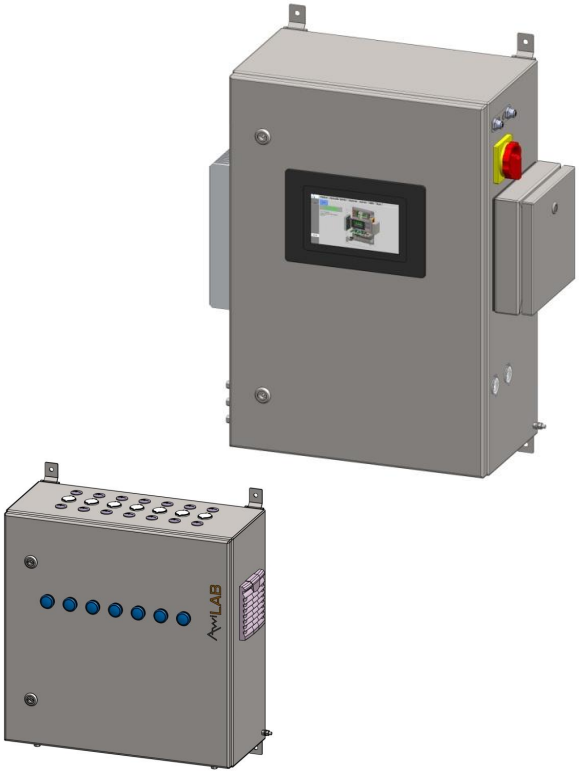
Lab Facilities

- AwiLAB Gasanalysis
- AwiLAB Digester

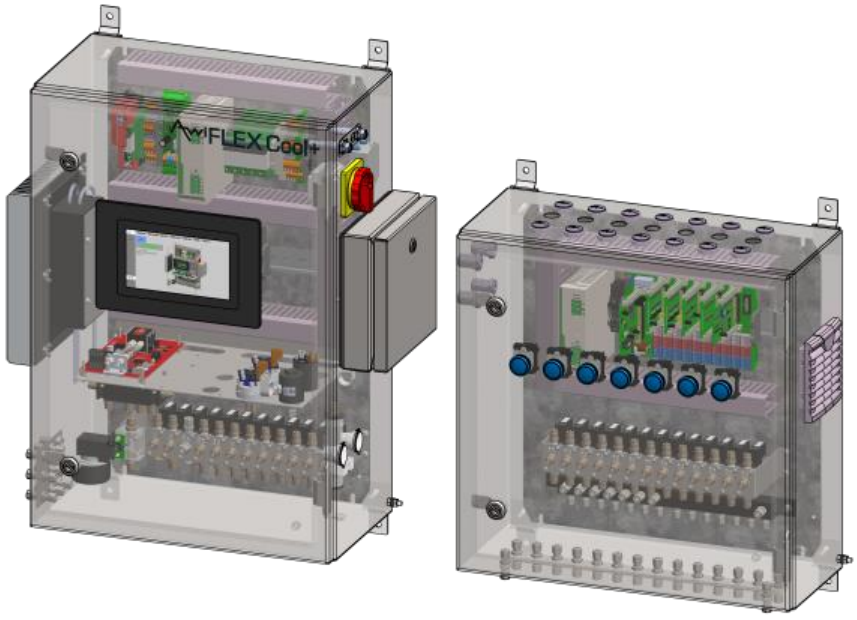


AWILAB GASANALYSIS

AWILAB GAS ANALYSIS

Our product family AwiLAB was especially developed for biogas application but can also be used for various researches in the gas sector.

The AwiLAB Gasanalysis guarantees smooth operating processes and with that your research.
In combination with our AwiFLEX system, the gas production and composition can be controlled and evaluated during the substrate fermentation process.



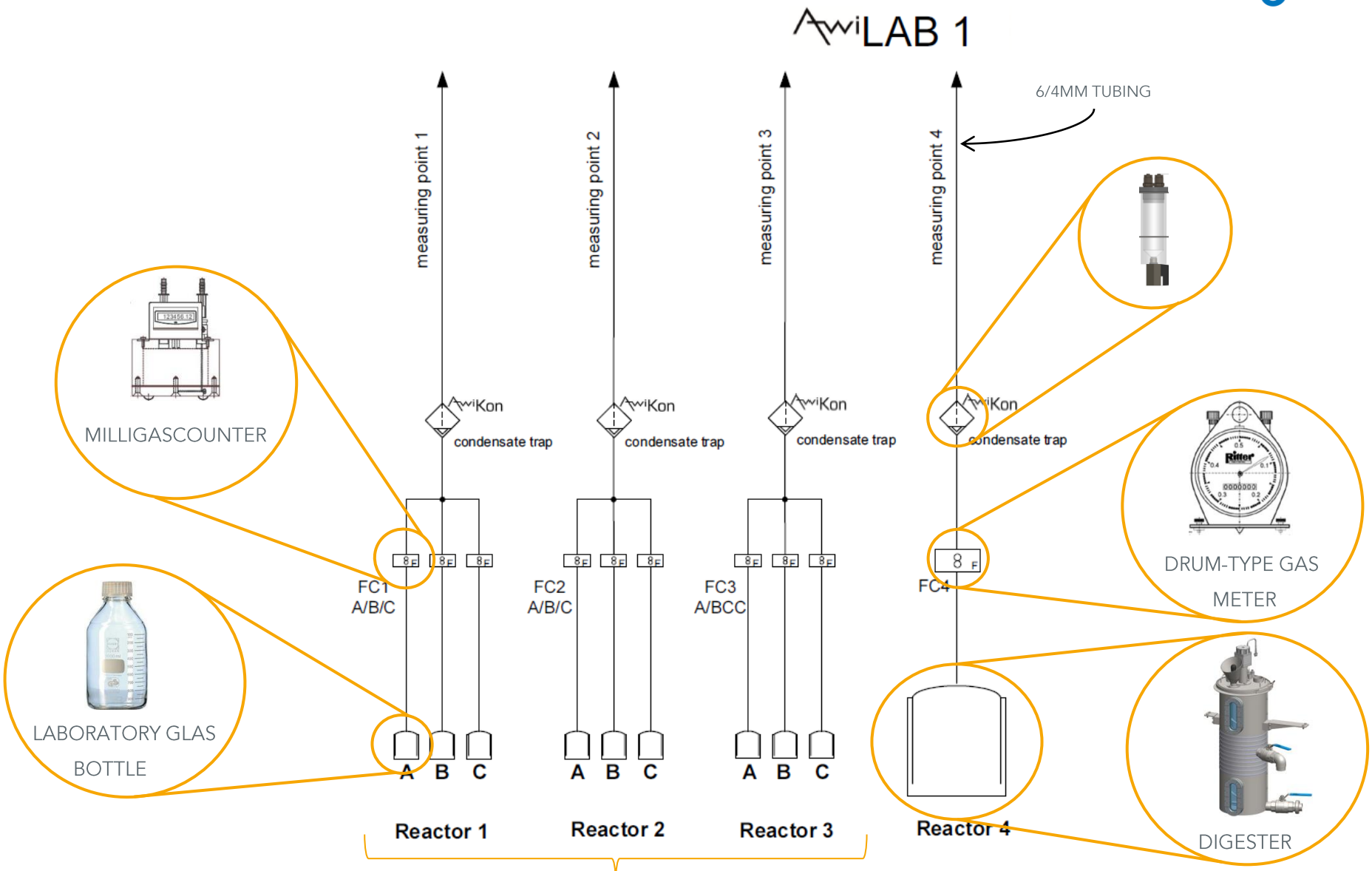
SCOPE OF APPLICATION

Batch/ discontinuous test

- gas production less than 4 l/ hr
- determination of
  - daily gas production
  - start/ end of fermentation process
  - time of maximum gas production
  - …
- comparison of different substrates with different TS contents or mixing ratios
- comparison from process changes during test (temperature, pressure, etc.)
- effect of the addition of additives (trace elements, etc.)
- effect of gas volume on organic load
- detection of
  - process disturbances in long-term operation
  - changes in gas composition

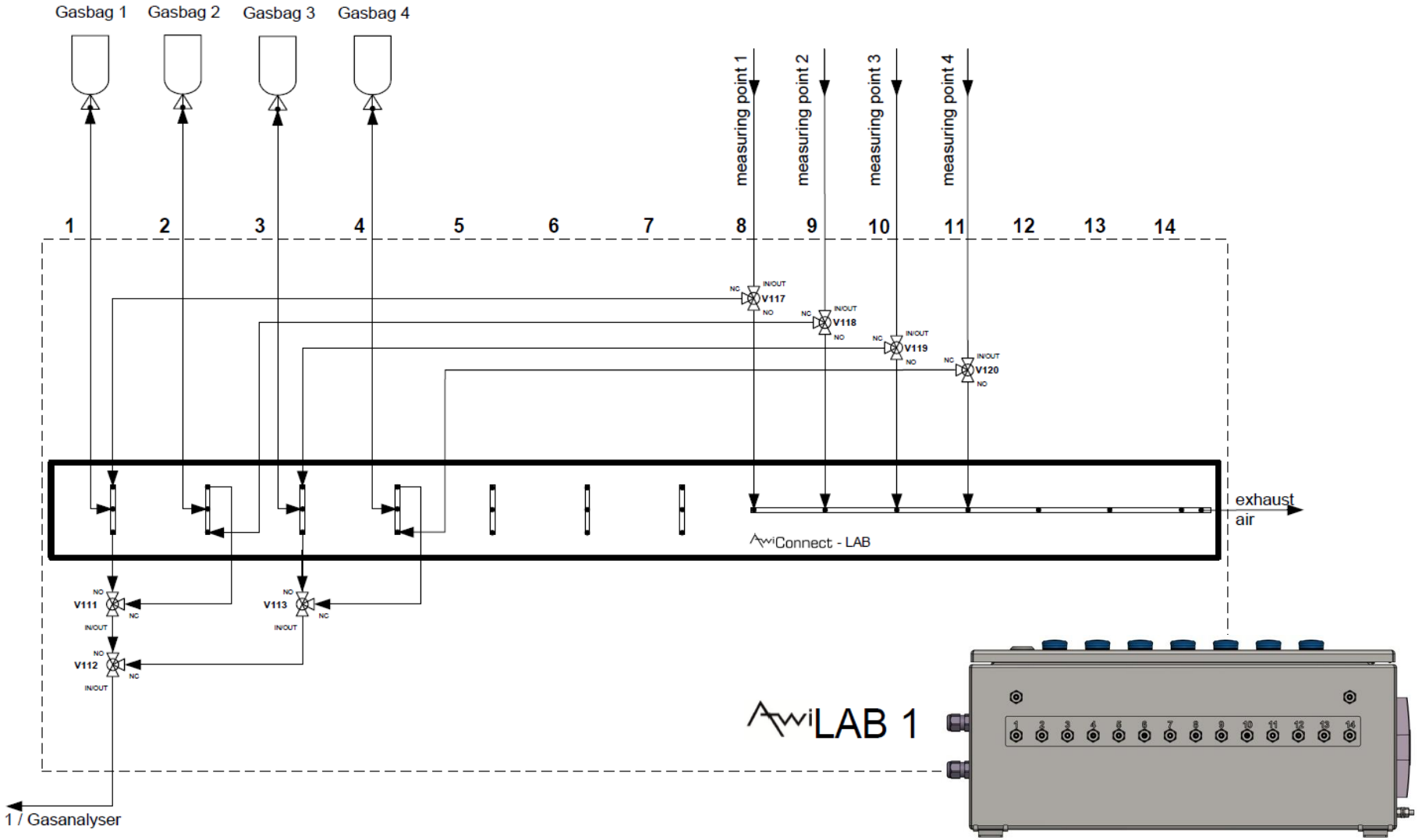
→ To answer scientific questions, a reference is required in addition to the experimental digester.

SET-UP

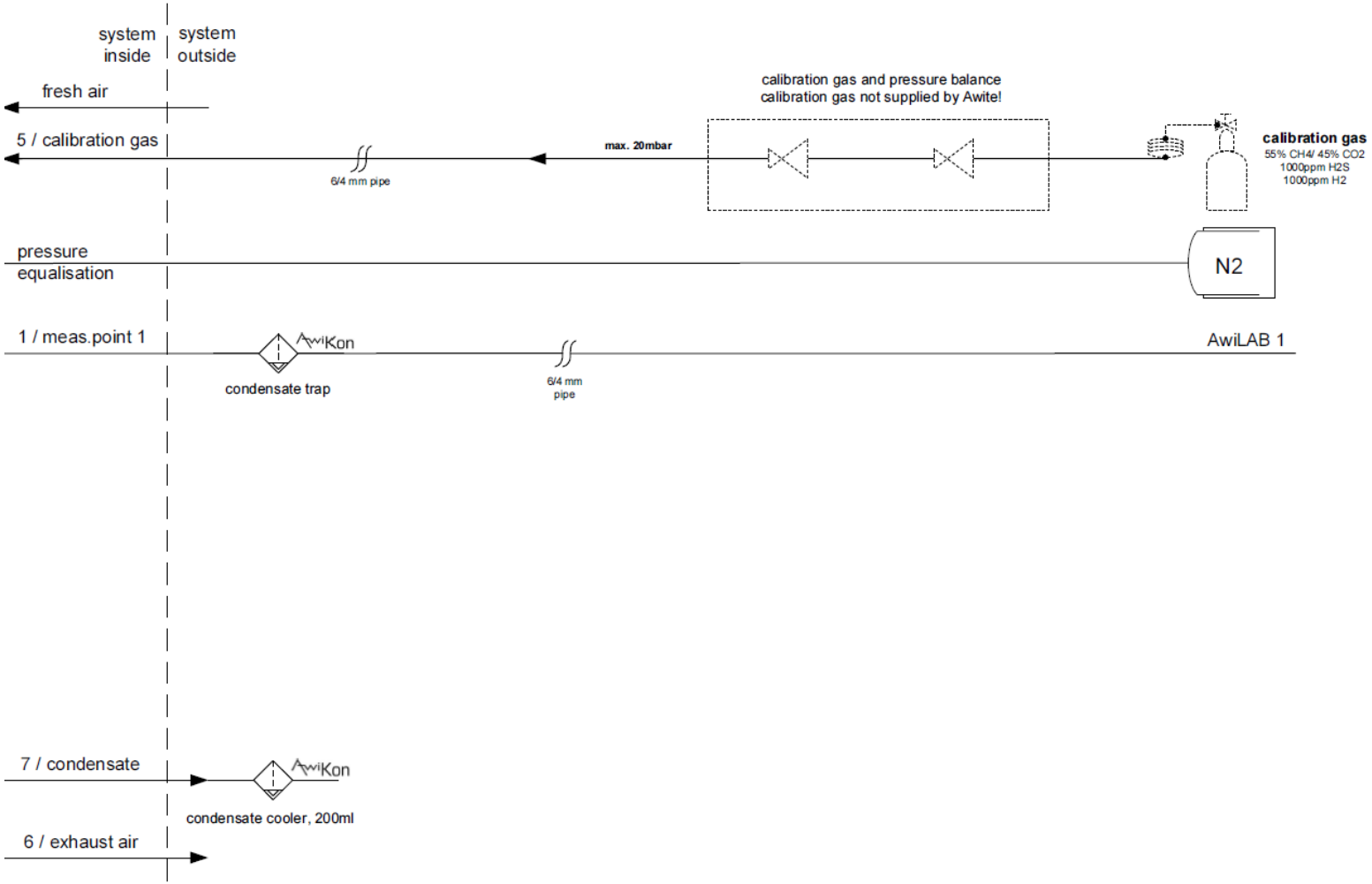


BATCH- TESTS

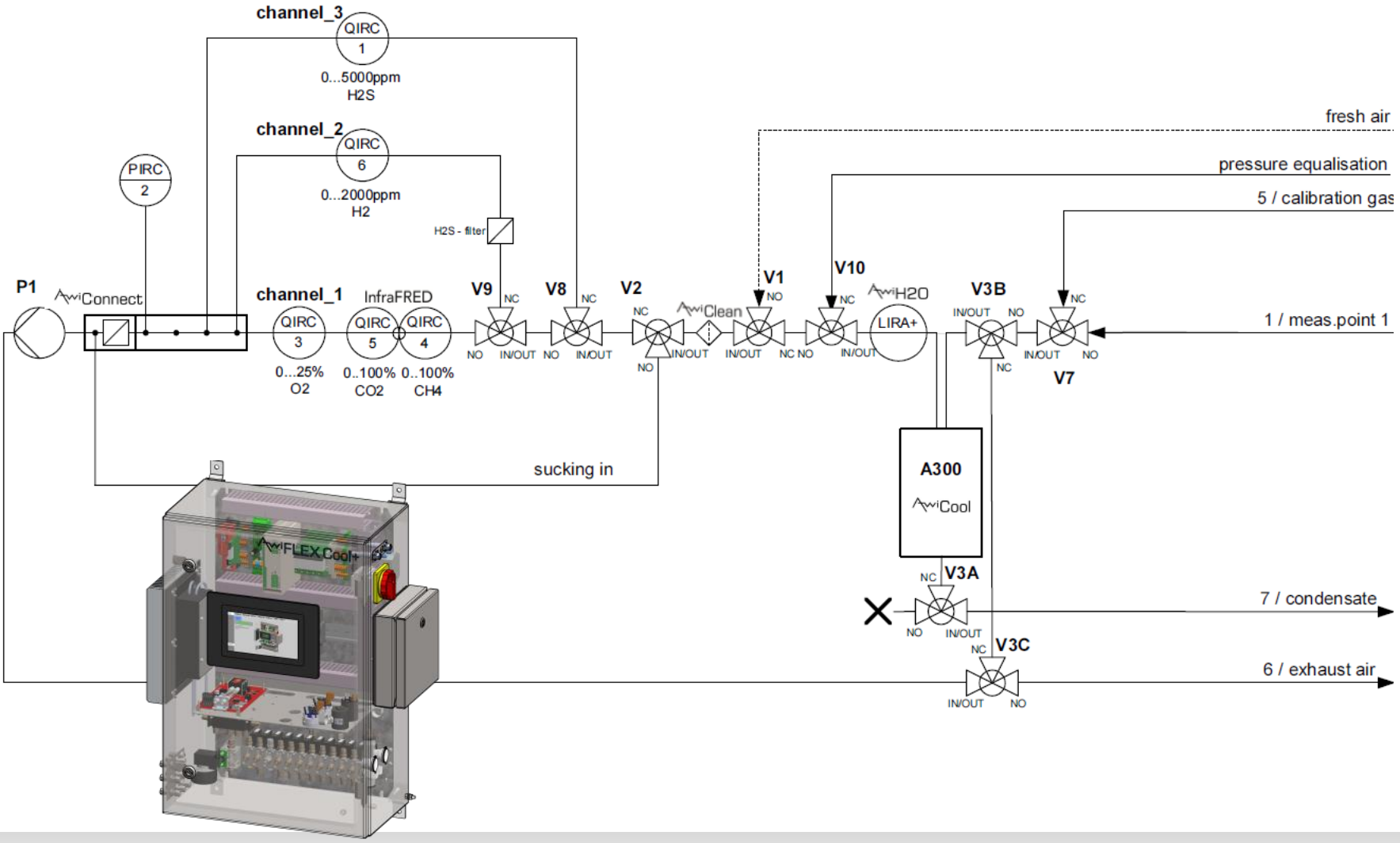
SET-UP


Gasbag 1
Gasbag 2
Gasbag 3
Gasbag 4
measuring point 1
measuring point 2
measuring point 3
measuring point 4
1
2
3
4
5
6
7
8
9
10
11
12
13
14
V117
V118
V119
V120
V111
V112
V113
IN/OUT
NC
NO
exhaust air
AwiConnect - LAB
AwiLAB 1
1 / Gasanalyser

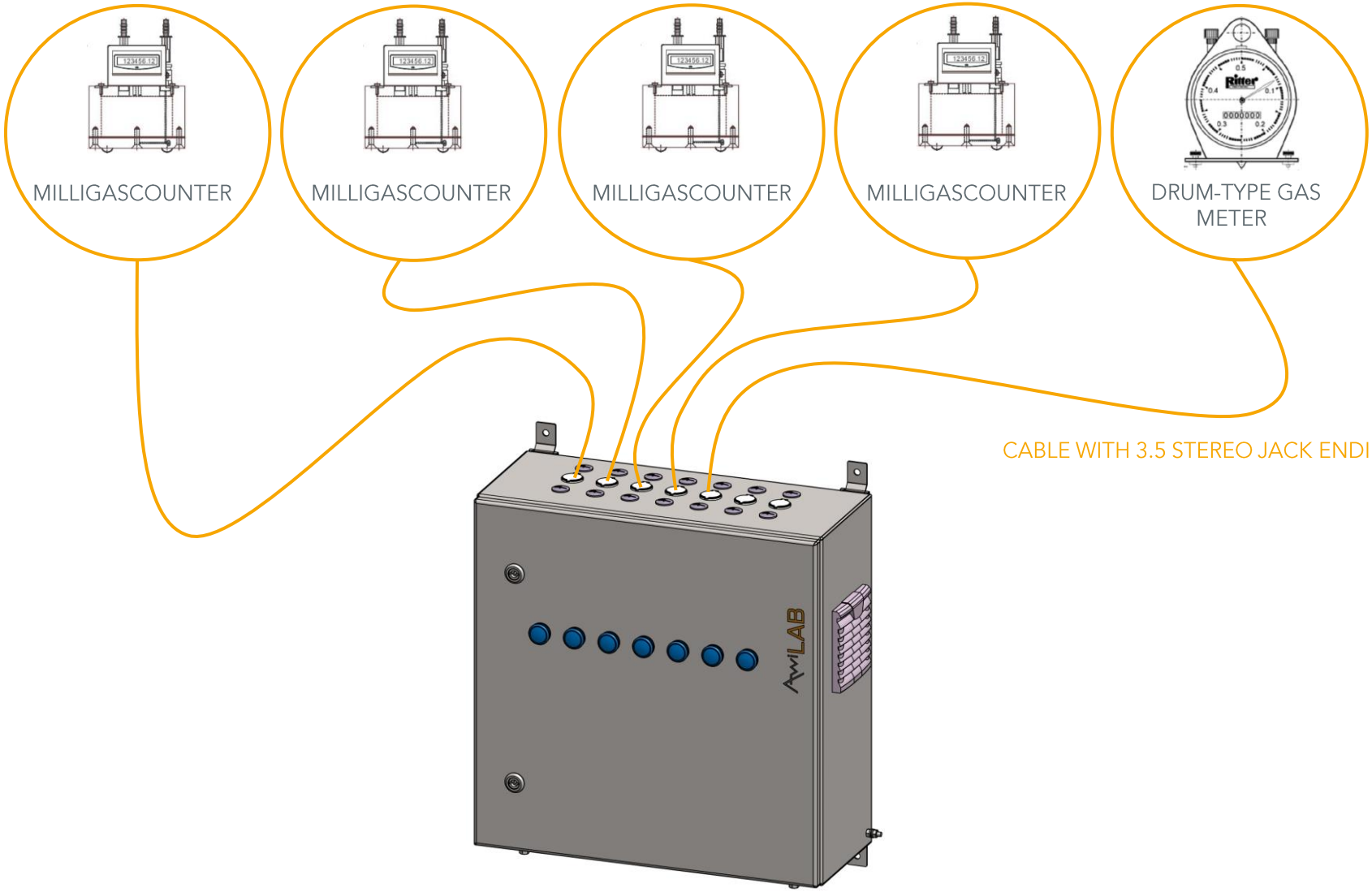
SET-UP


system inside
system outside
fresh air
5 / calibration gas
6/4 mm pipe
max. 20mbar
calibration gas and pressure balance
calibration gas not supplied by Awite!
calibration gas
55% CH4/ 45% CO2
1000ppm H2S
1000ppm H2
pressure equalisation
N2
1 / meas.point 1
AwiKon
condensate trap
6/4 mm pipe
AwiLAB 1
7 / condensate
AwiKon
condensate cooler, 200ml
6 / exhaust air

SET-UP


channel_3
QIRC
1
0...5000ppm
H2S
channel_2
QIRC
6
0...2000ppm
H2
PIRC
2
H2S - filter
P1
AwiConnect
channel_1
QIRC
3
0...25%
O2
InfraFRED
QIRC
5
0..100%
CO2
QIRC
4
0..100%
CH4
V9
V8
V2
AwiClean
V1
V10
AwiH2O
LIRA+
V3B
V7
fresh air
pressure equalisation
5 / calibration gas
1 / meas.point 1
sucking in
A300
AwiCool
V3A
V3C
7 / condensate
6 / exhaust air
AwiFLEX Cool+

SET-UP


MILLIGASCOUNTER
MILLIGASCOUNTER
MILLIGASCOUNTER
MILLIGASCOUNTER
DRUM-TYPE GAS METER
CABLE WITH 3.5 STEREO JACK ENDINGS
AwiLAB

FEATURES

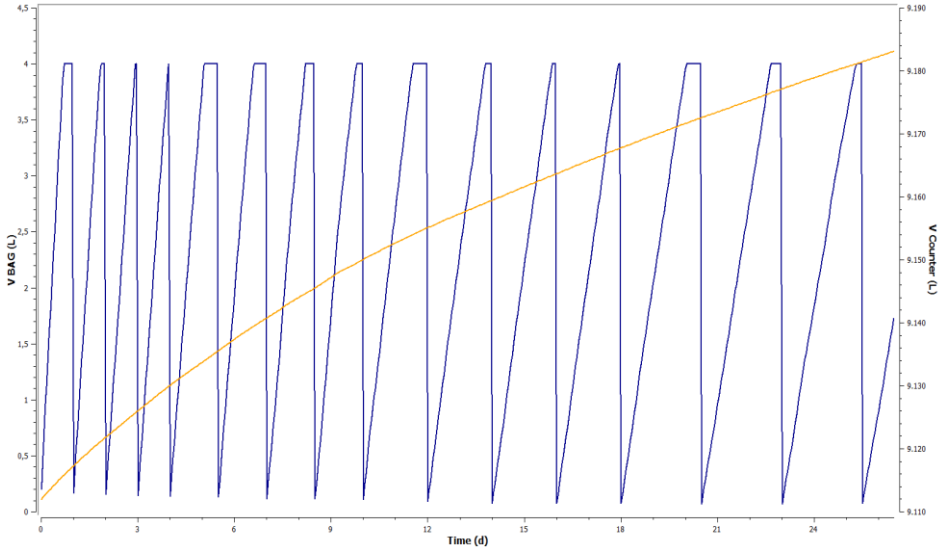
- stainless steel housing (WxHxD = 500x500x210 mm) for wall mounting completely assembled.

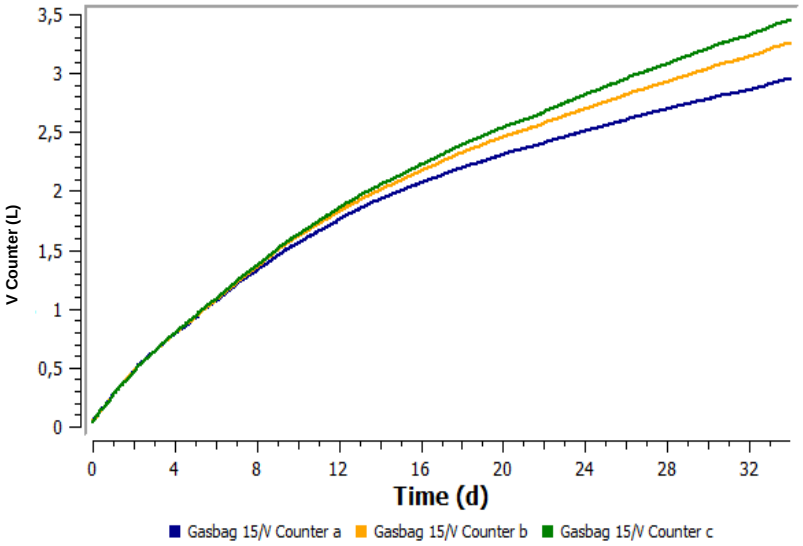
- connections for max. 21 Milligascounter (MGC) for triple determination via 3.5 mm jack plug (3-pin) or
- connection of max. 7 drum-type gas meters via 3.5 mm jack plug (3-pin) or
- combination of MGC and drum-type gas meters
- max. 14 process connection (threaded hose connections made of stainless steel 4/6 mm)
    - 7 connections for measuring point
    - 7 connection for gas bags
- control of encapsulated analysis valves (changeover to exhaust air with full bag)
- max. 7 LED indicator lights for status display
- 1 measuring point extension to gas analysis system for pressure compensation (N2)
- data connection to Awite process analysis system via RS485
- AwiCore electronic module consisting of:
    - controller module
    - AWICORE CBase fitted with:
        - 2x 8x digital output plug-in card
        - 3x 8x digital input plug-in card

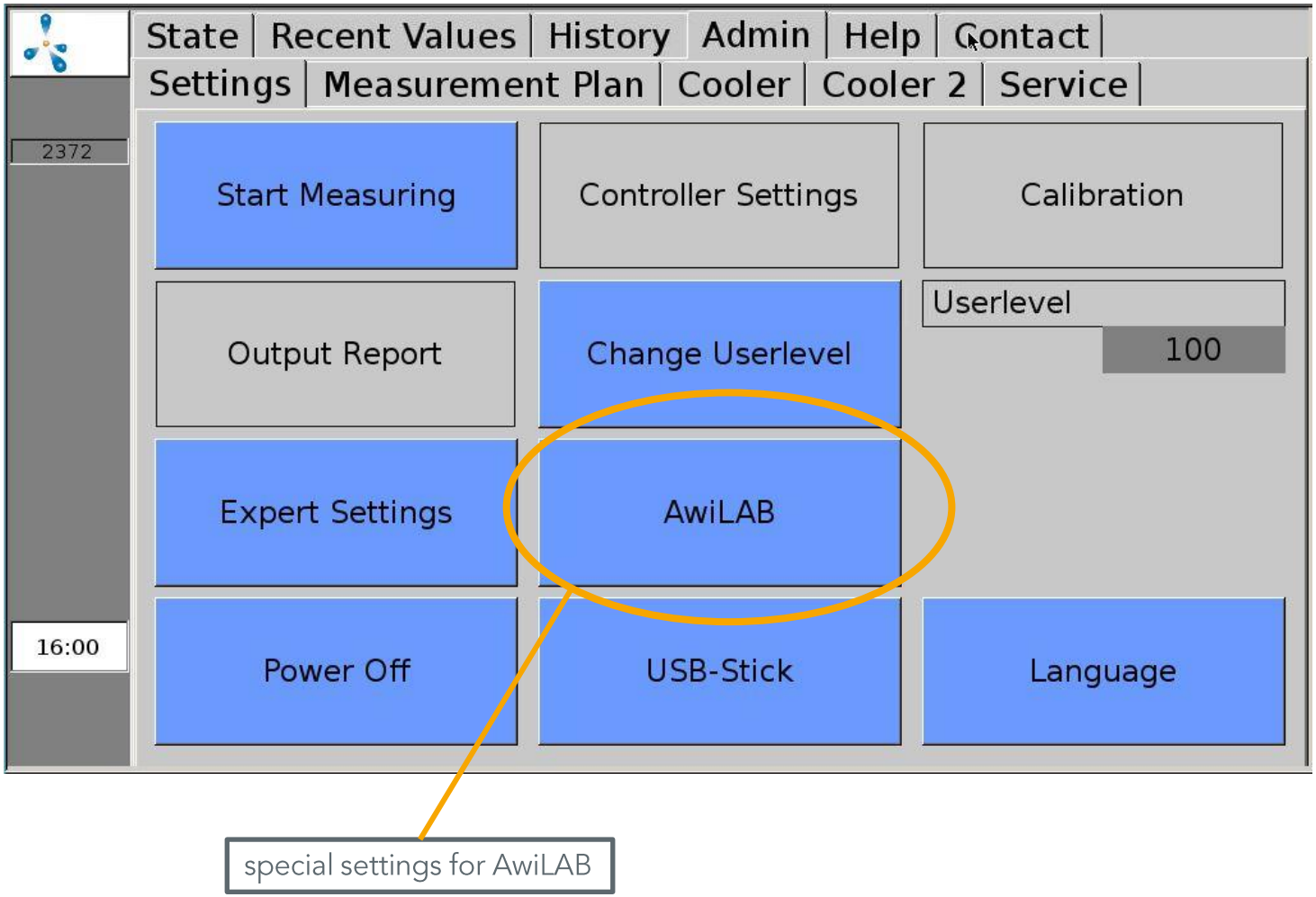
- maximum combination with
    - max 63 pcs. Milligascounters for triple determination
    - max 21 pcs. Drum-type gas meters or
    - combination of MGC and drum-type gas meters

FEATURES

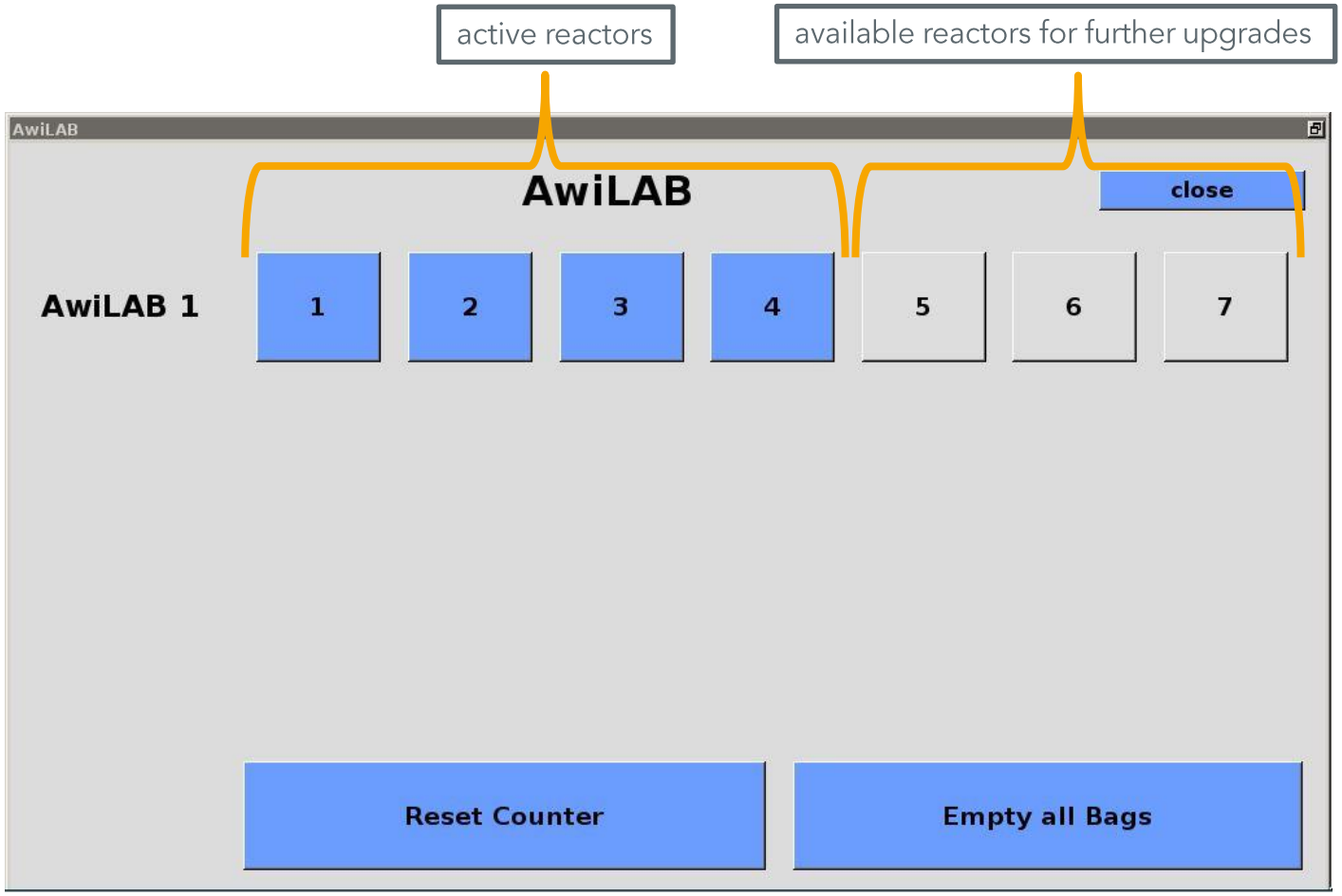
- recording the gas volumes produced per fermenter
- recording the current filling levels of the gas bags per fermenter
- automatic release for measurement at a certain adjustable volume
- automatic emptying of the bag after measurement via pressure sensor
- reset function for individual counter and filling level for bag
- input of counter values (milligascounter/ drum-type gas meter)
- input of calibration factors
- visualization on 7" touch panel of the gas analysis system AwiFLEX
- with milligascounter : Fault detection when the MGC is stuck





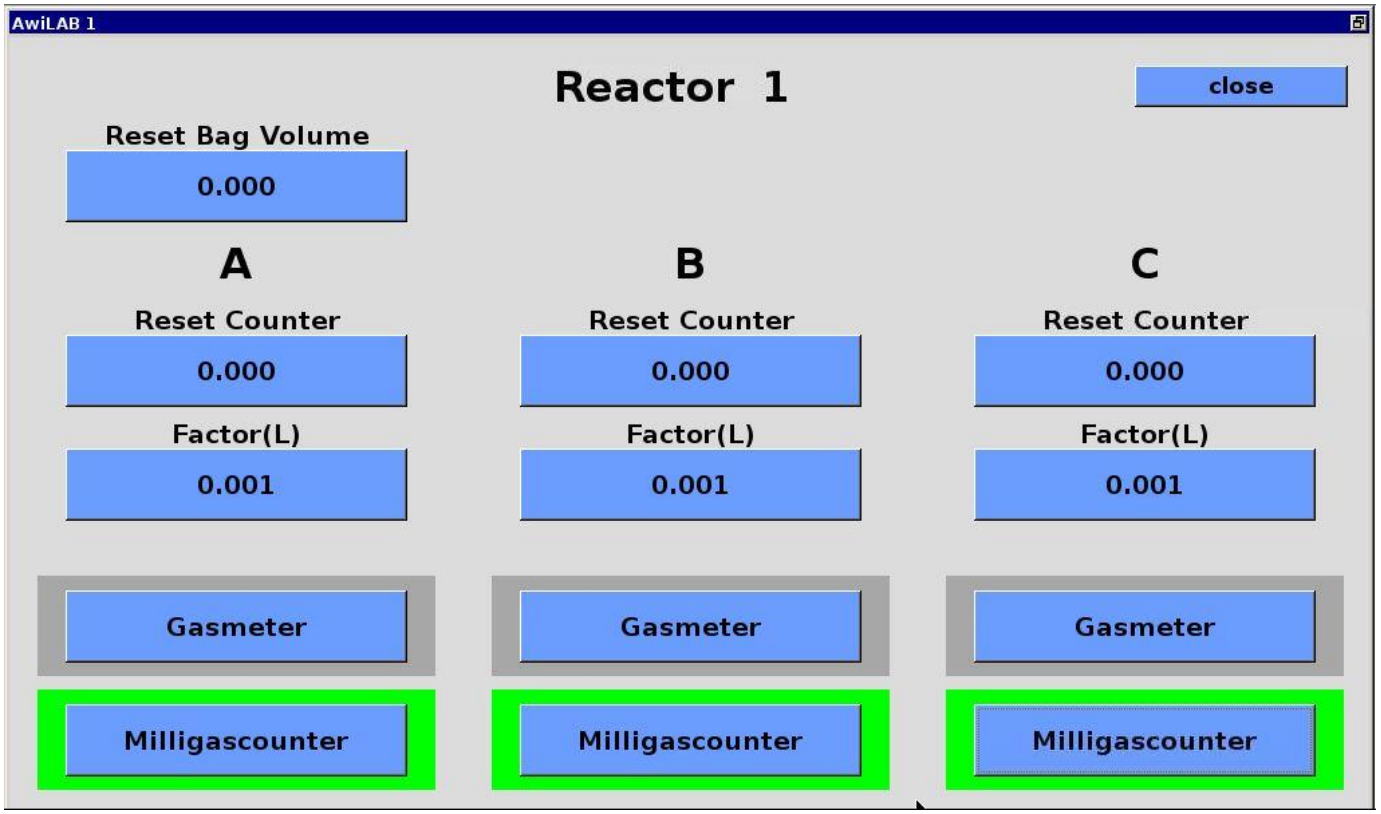

State
Recent Values
History
Admin
Help
Contact
Settings
Measurement Plan
Cooler
Cooler 2
Service
2372
Start Measuring
Controller Settings
Calibration
Output Report
Change Userlevel
Userlevel
100
Expert Settings
AwiLAB
16:00
Power Off
USB-Stick
Language
special settings for AwiLAB

VISUALISATION & MENU NAVIGATION

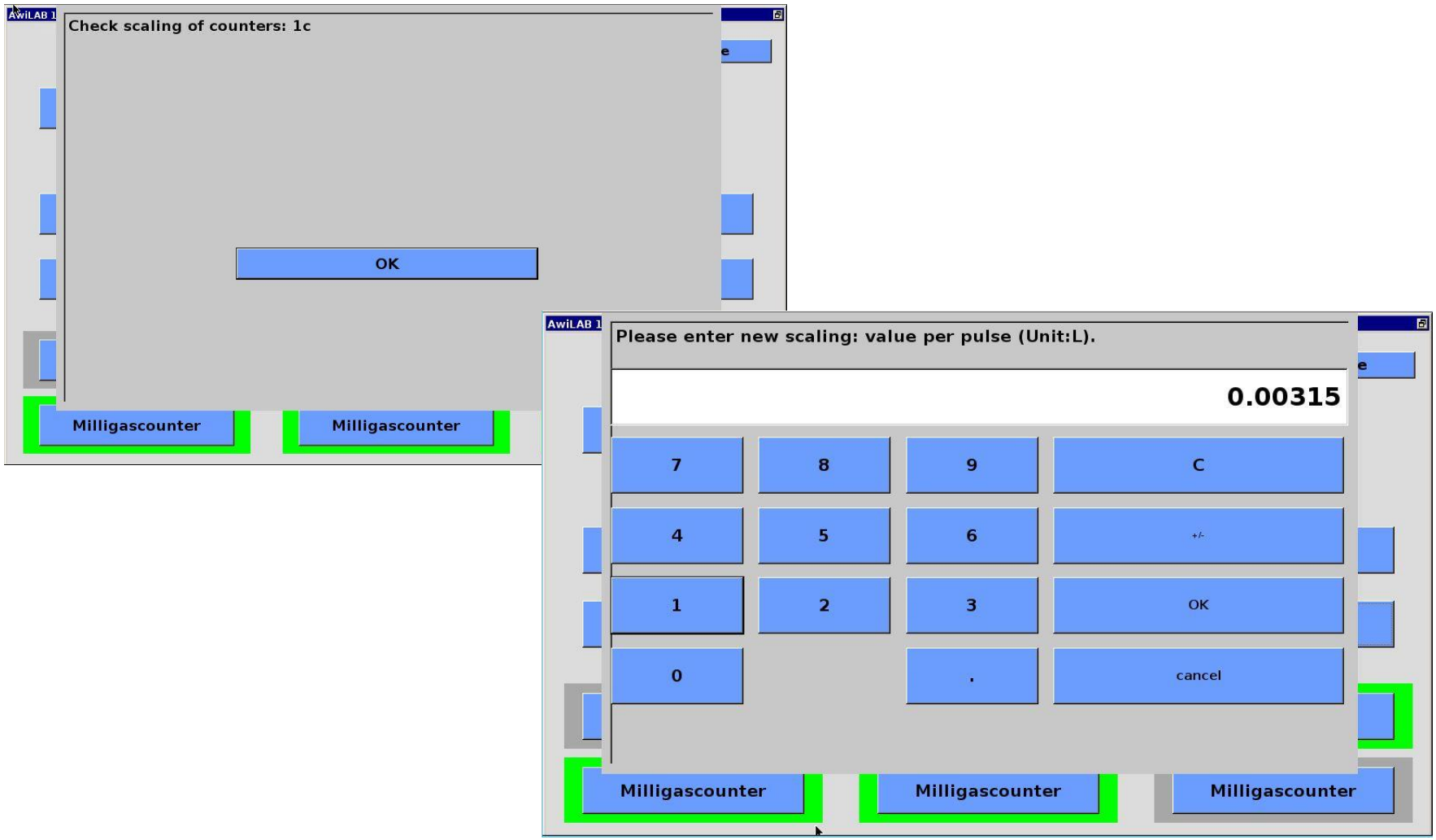


VISUALISATION & MENU NAVIGATION

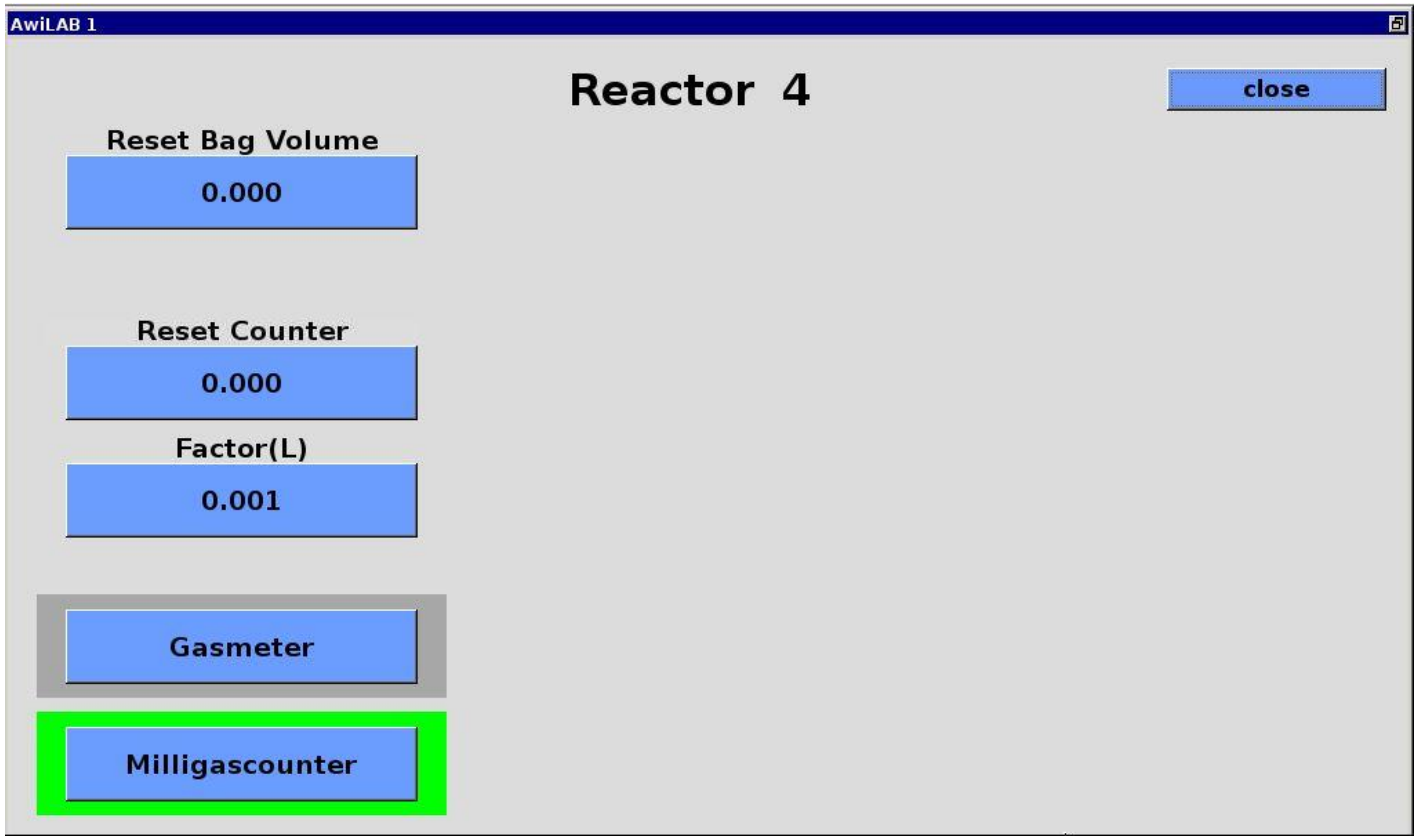
Batch
- triple- determination
- 3 reactors (A/B/C) fill one gasbag



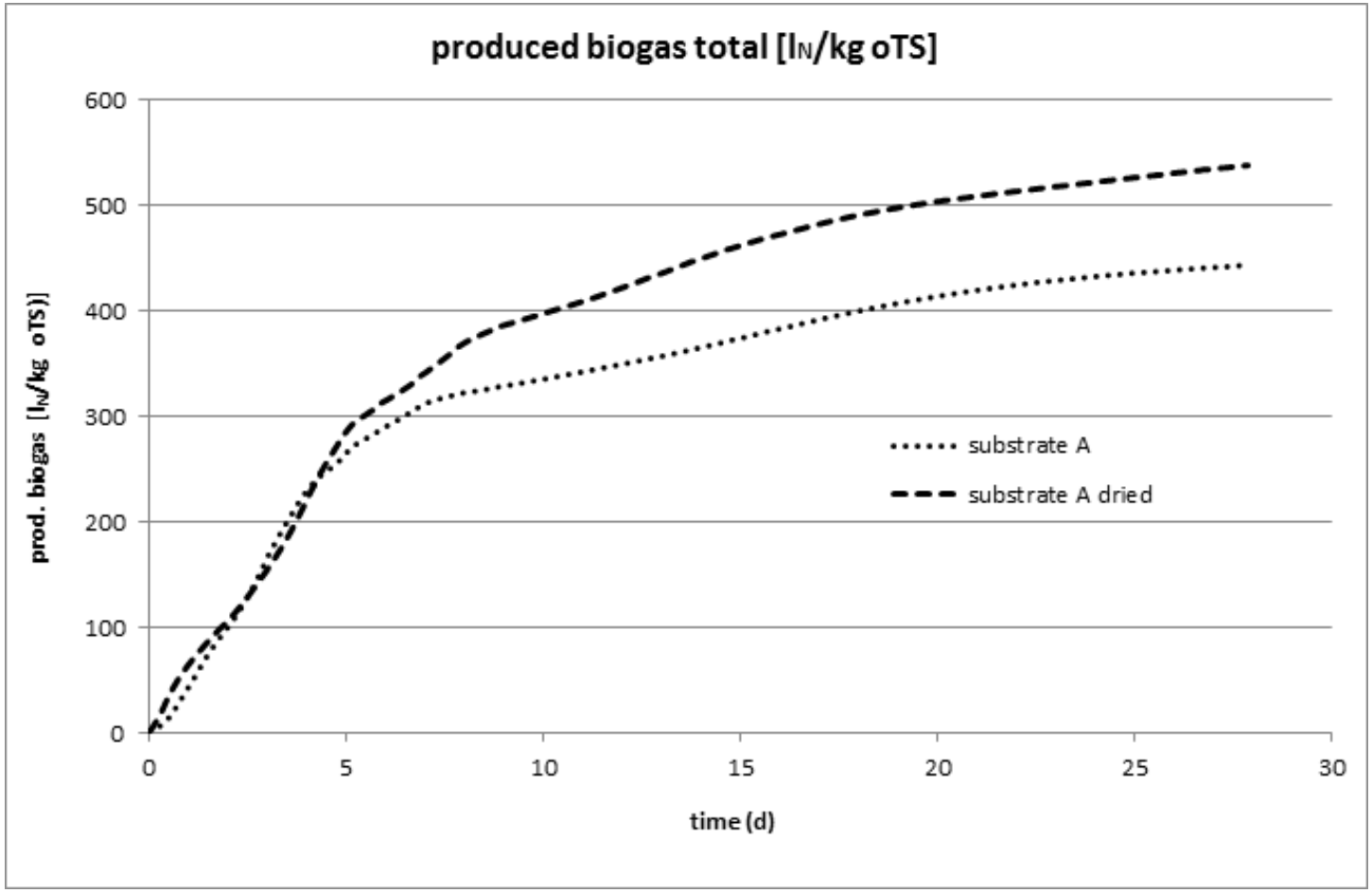
VISUALISATION & MENU NAVIGATION



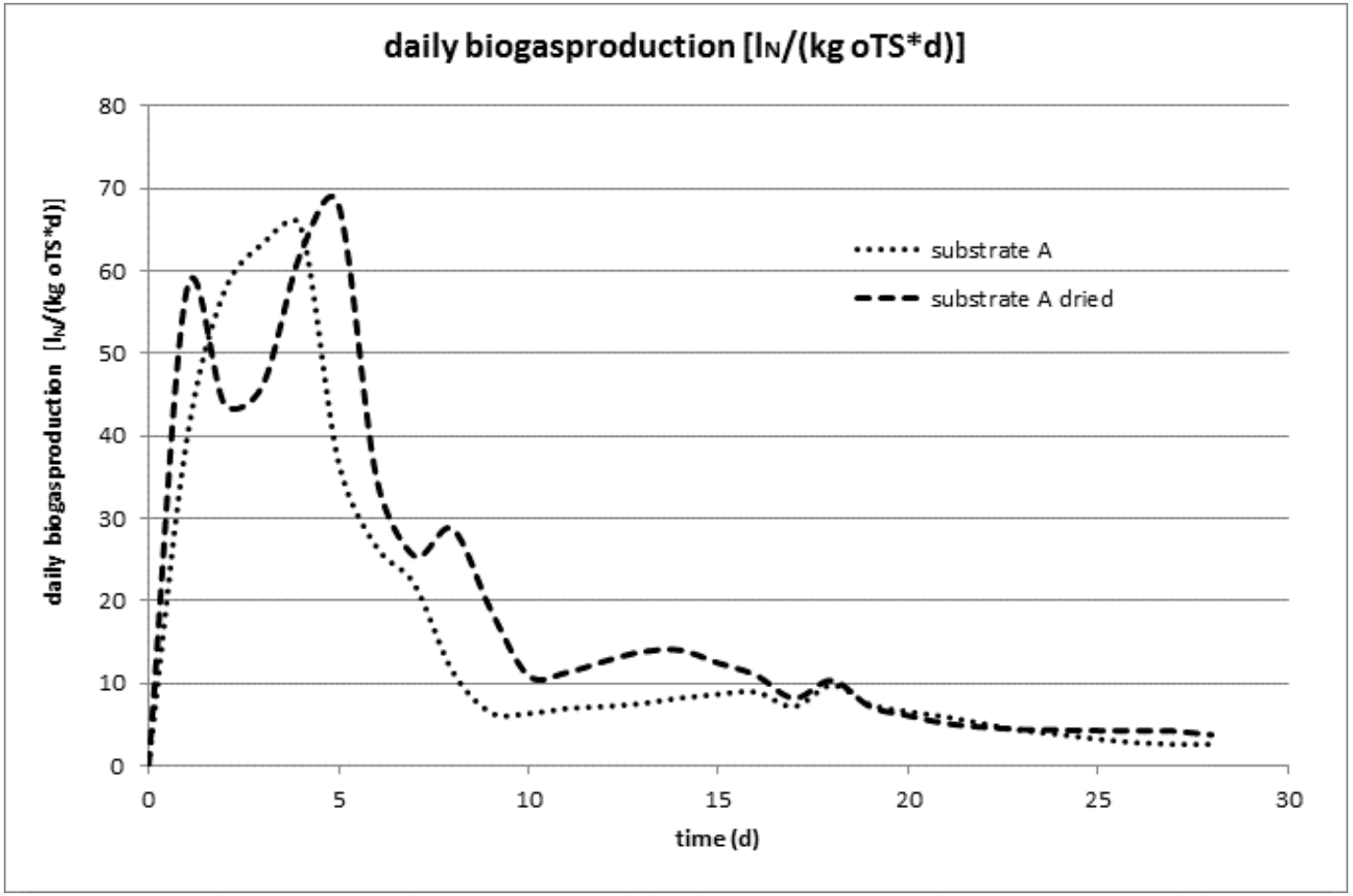
Continuous stirred digesters (one gasmeter)



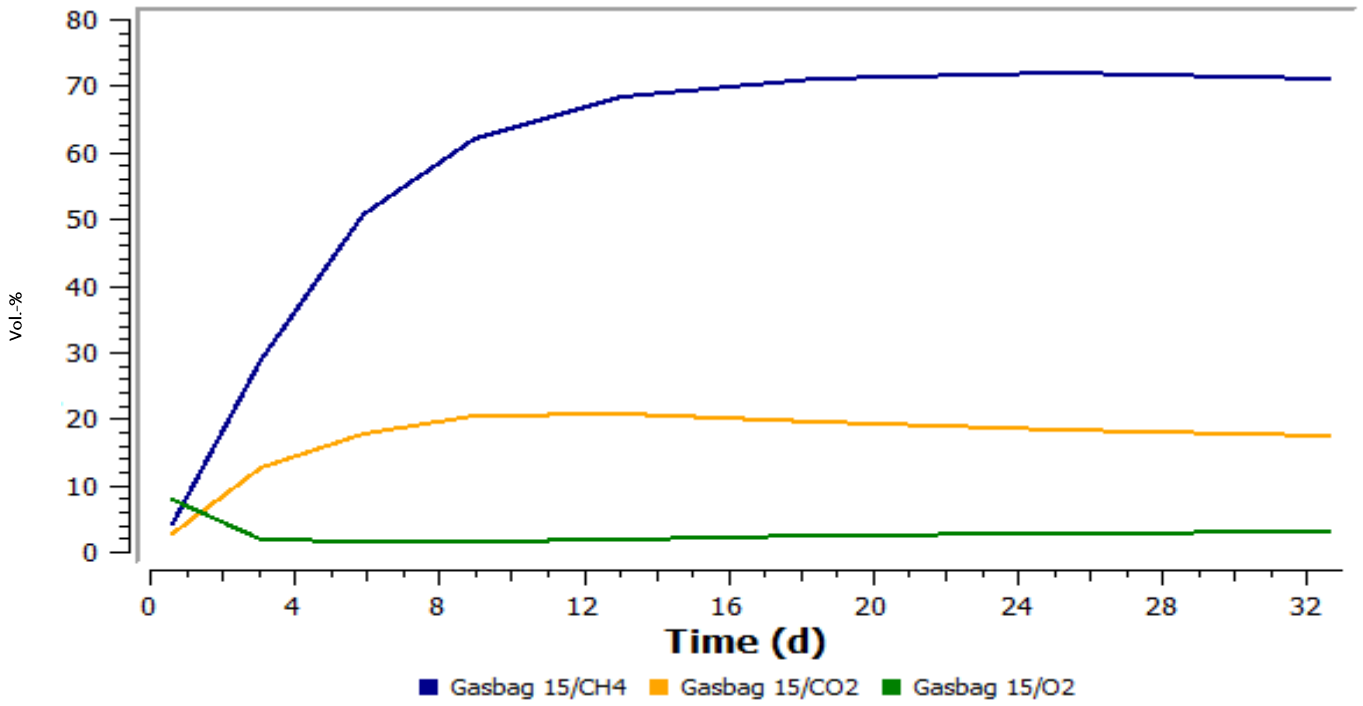
Application: Batch



Application: Batch



CH_4, CO_2 and O_2 values



AWILAB DIGESTER

AWILAB DIGESTER

Our AwiLAB Digester is an all-in lab facility for your research.

„Stand Alone“

„Modular“

EQUIPMENT

The AwiLAB Digester ...

- → stand-alone or modular system - up to 7 digester modules
- → compact & space-saving
- → variable digester sizes/ stainless steel digester especially for biogas application/ completely insulated
- → sight glasses for visual process monitoring
- → process-optimised stirrer technology/ high-performance stirrer/ simmering seal
- → customized stirrer configuration/ specific interval stirring
- → removable stirrer for safe and easy removal
- → individual heating program
- → continuous monitoring and adjustment of temperature
- → sampling at the most homogeneous zone
- → special seals on the entire fermenter
- → integrated self-pressure test for leak-test of the digester
- → integrated overpressure protection
- → operation und visualisation with 7-TFT-Touch-Display

EQUIPMENT

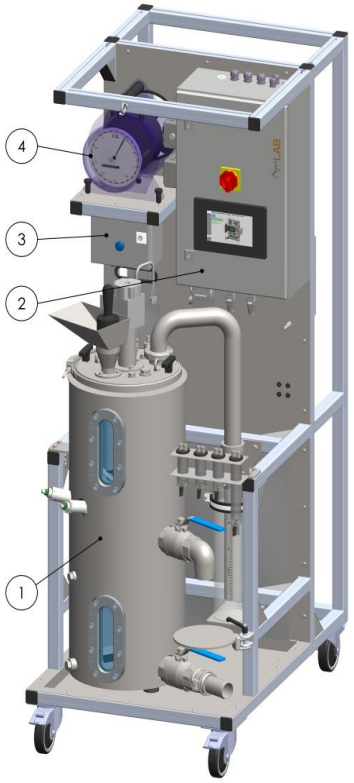
The AwiLAB Digester ...

- → fully automatic phase monitoring
- → automatic measuring point switchover
- → fully automatic measurement of gas quality
- → automatic normalisation of the gas volume
- → gas storage bag (5l); pressure equalisation fermenter (2 l) and after measurement (15 l)
- → time-controlled emptying of the gas bags
- → continuous monitoring of trials - also via remote access! (AwiMobileControl)
- → online process measuring and control technology/ various ports for measurement technology
- → central data collection and storage
- → graphical and tabular analysis (AwiCharts/ AwiControl/ AwiView)
- → extensive alarm and error messages
- → no additional software licenses

SET-UP

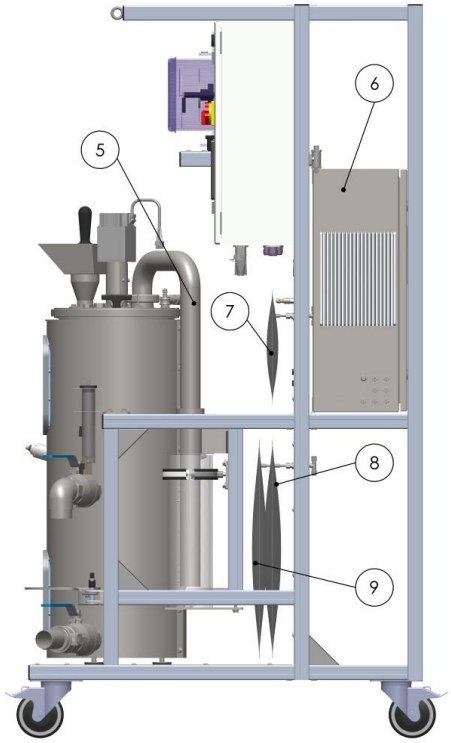
PROCESS OPTIMISATION

USER-FRIENDLY



INDIVIDUALLY CONTROLLABLE

COMPACT



HIGH QUALITY STANDARD

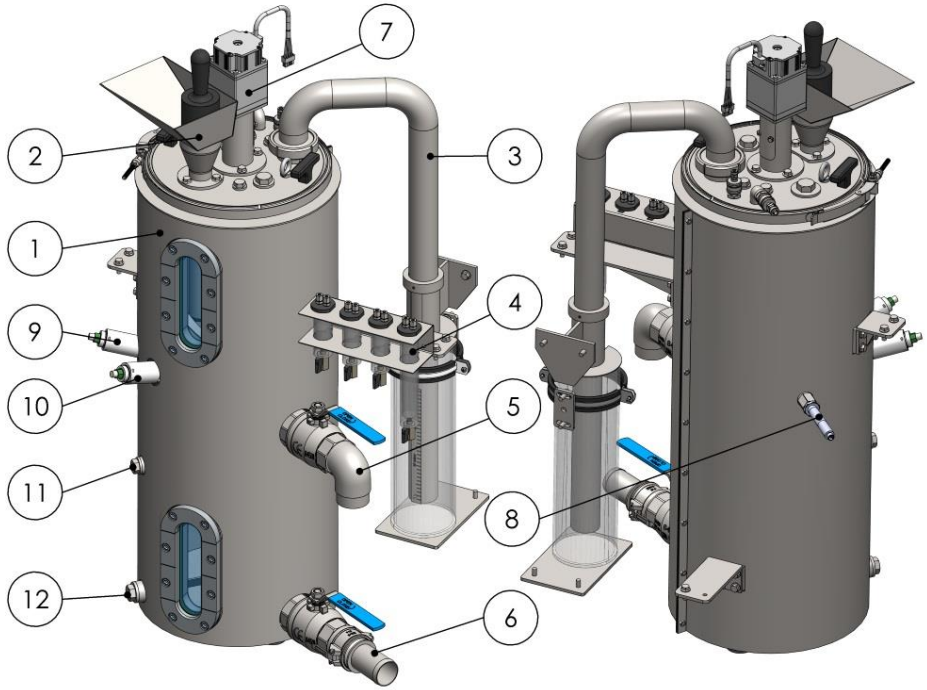
1. Digester
2. Control cabinet incl. display
3. Electrical cabinet gas collector
4. Drum-type gas meter

5. Overpressure protection
6. Gas analysis system
7. Gas compensation bag
8. Inert gas bag
9. Gas storage bag analysis gas

SET-UP

EXTENDABLE SENSORS

PROCESS CONTROL

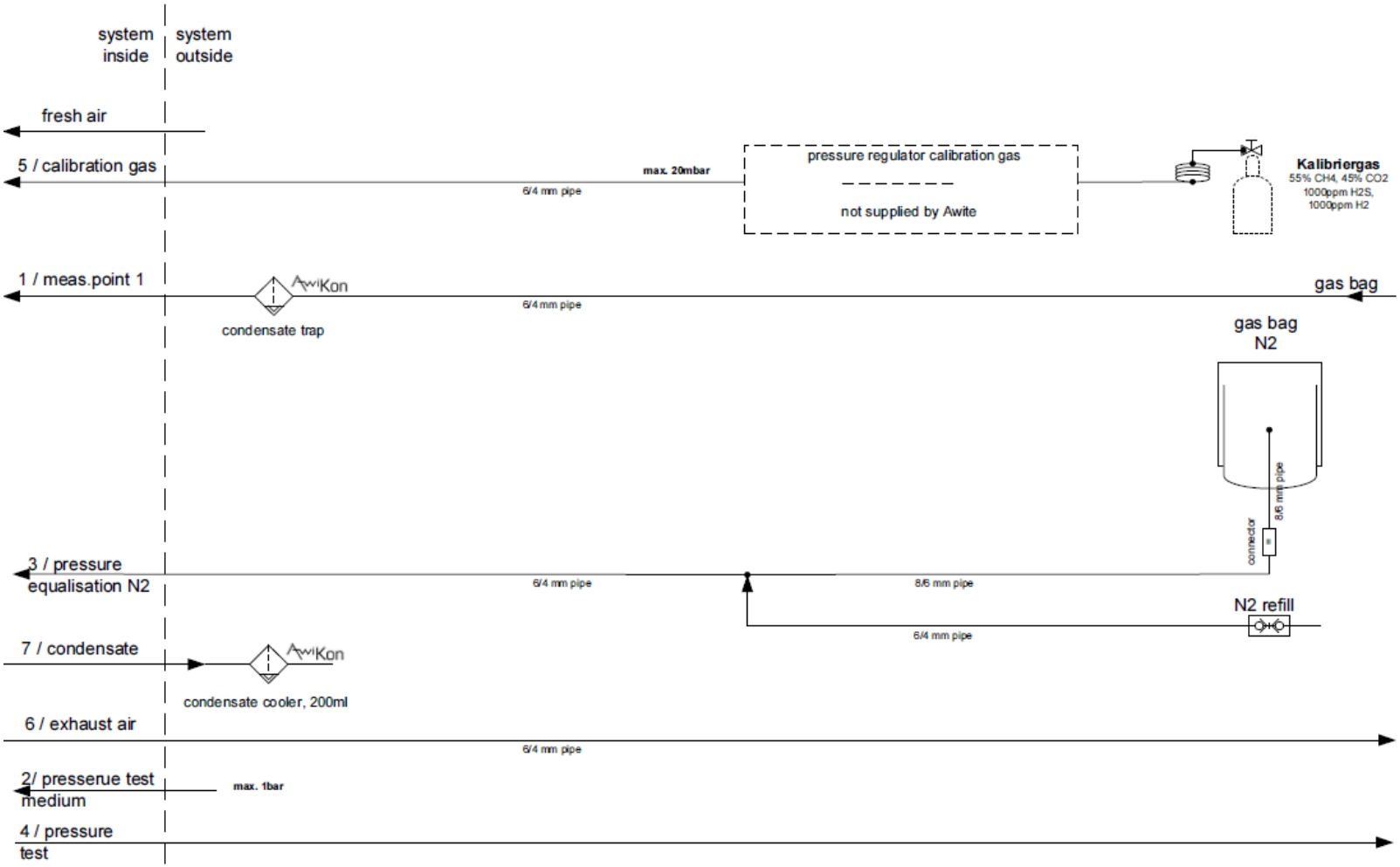


MAXIMUM OPERATING SAFETY

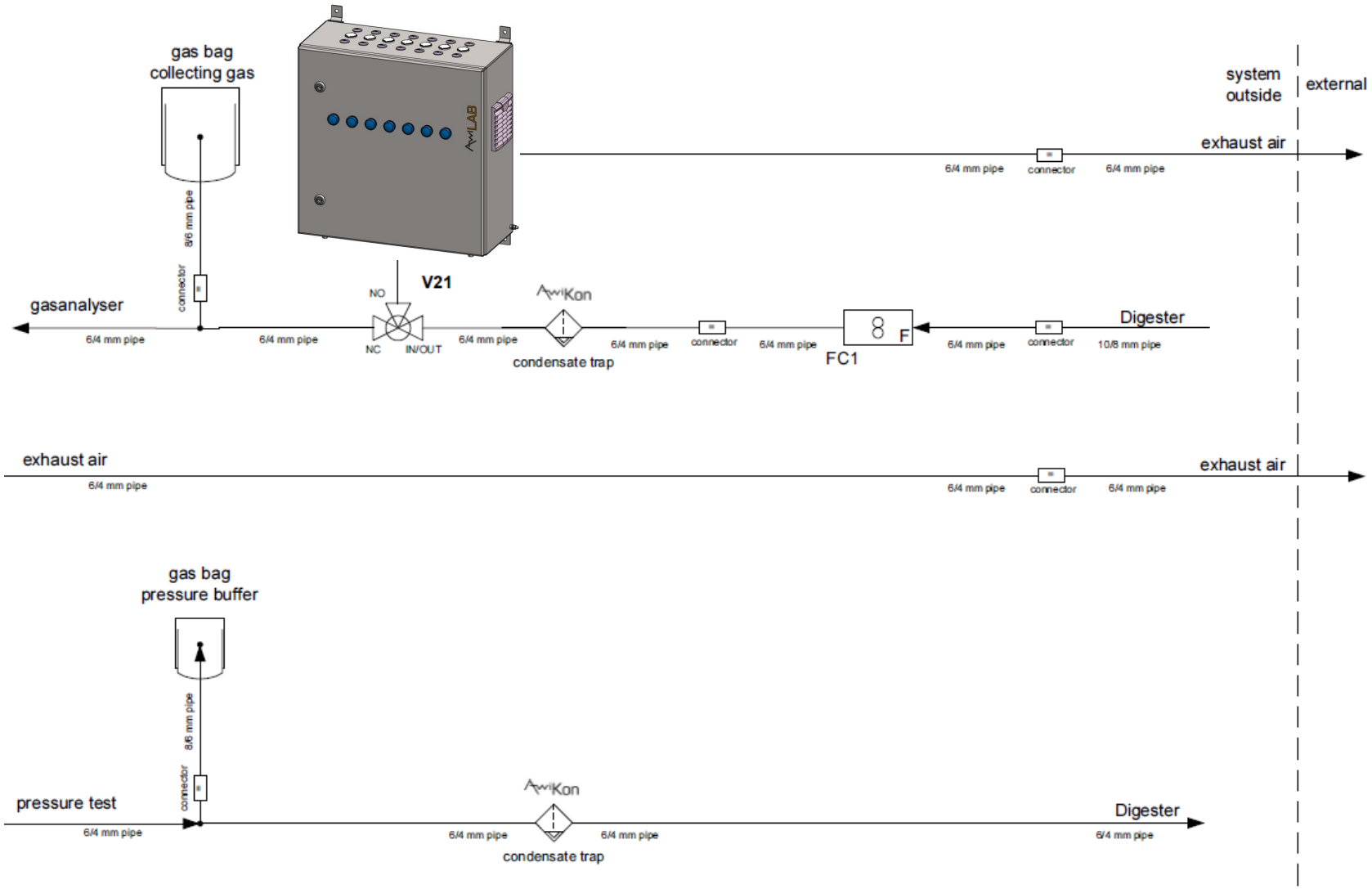
1. Digester
2. Filling mechanism
3. Overpressure protection
4. Condensate separator
5. Sampling port
6. Emptying port
7. Engine with stirrer
8. Temperature sensor
9. Optional sensor
10. Optional sensor
11. Optional connection
12. Optional connection

optional further installations possible

SET-UP


system inside
system outside
fresh air
5 / calibration gas
max. 20mbar
6/4 mm pipe
pressure regulator calibration gas
not supplied by Awite
Kalibriergas
55% CH4, 45% CO2
1000ppm H2S,
1000ppm H2
1 / meas.point 1
AwiKon
condensate trap
6/4 mm pipe
gas bag
gas bag
N2
8/6 mm pipe
connector
3 / pressure
equalisation N2
6/4 mm pipe
8/6 mm pipe
N2 refill
6/4 mm pipe
7 / condensate
AwiKon
condensate cooler, 200ml
6 / exhaust air
6/4 mm pipe
2/ presserue test
medium
max. 1bar
4 / pressure
test

SET-UP


gas bag
collecting gas
8/6 mm pipe
connector
gasanalyser
6/4 mm pipe
6/4 mm pipe
NO
NC
IN/OUT
V21
6/4 mm pipe
condensate trap
6/4 mm pipe
connector
6/4 mm pipe
FC1
6/4 mm pipe
connector
Digester
10/8 mm pipe
system
outside
external
exhaust air
6/4 mm pipe
connector
6/4 mm pipe
exhaust air
exhaust air
6/4 mm pipe
6/4 mm pipe
connector
6/4 mm pipe
exhaust air
gas bag
pressure buffer
8/6 mm pipe
connector
pressure test
6/4 mm pipe
6/4 mm pipe
condensate trap
6/4 mm pipe
Digester
6/4 mm pipe

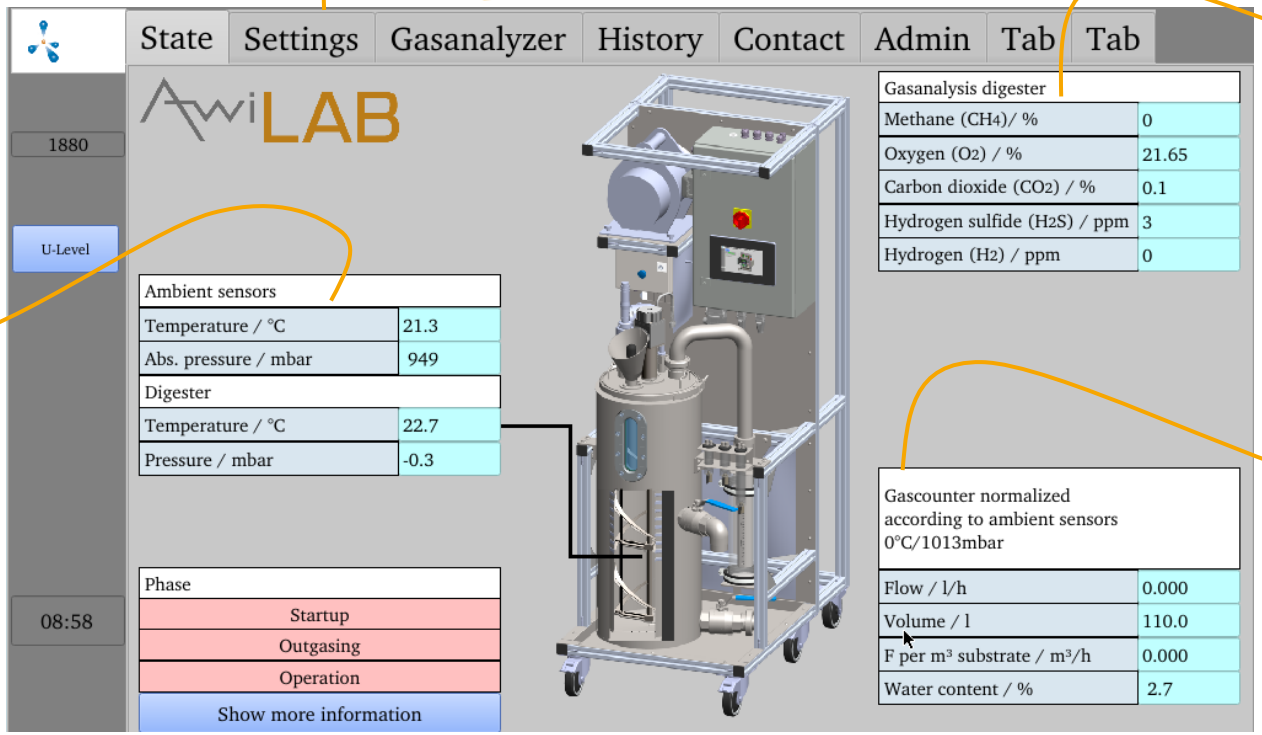
VISUALISATION & MENU NAVIGATION

INDIVIDUAL CONFIGURED

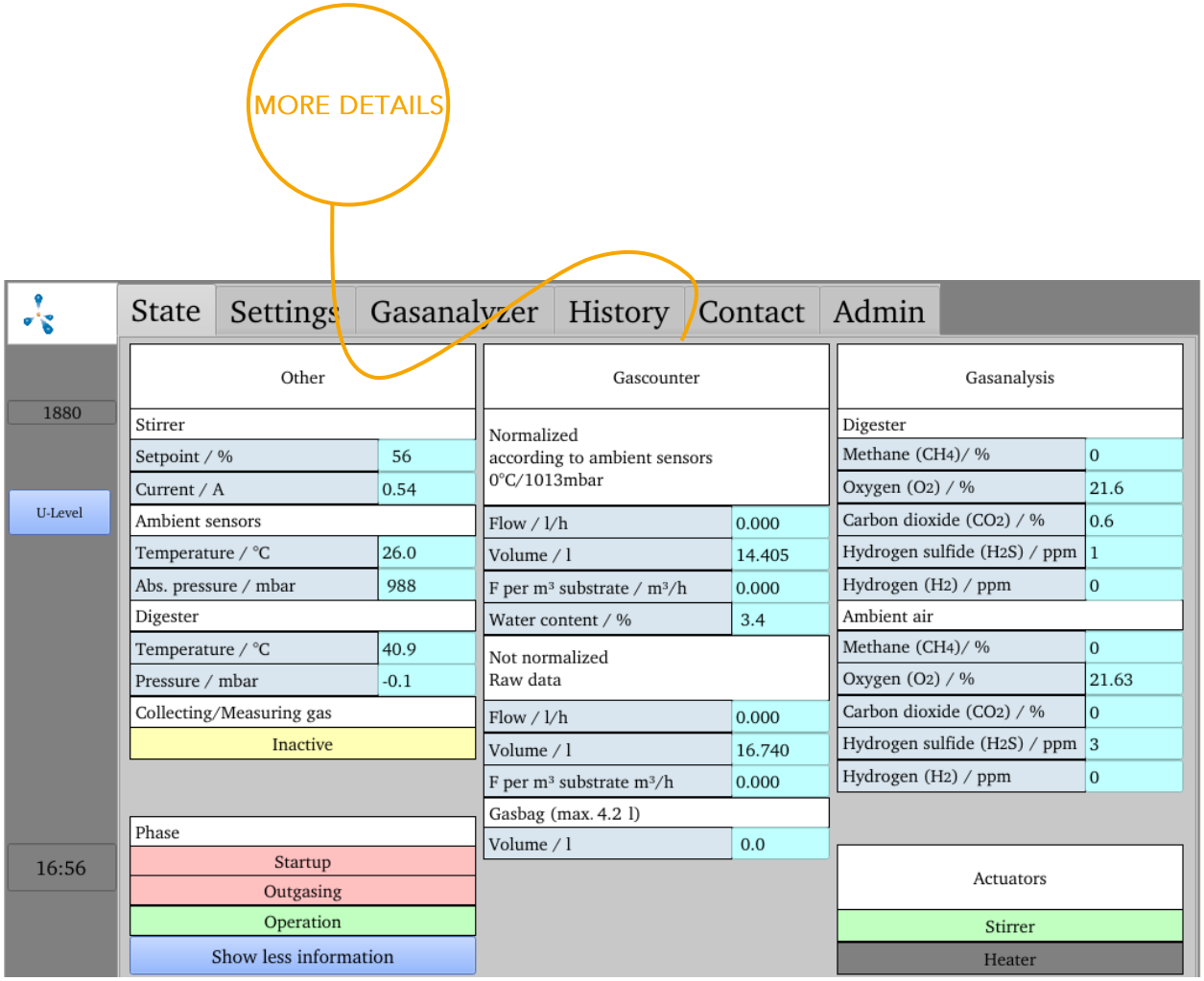
AMBIENT CONDITIONS

GAS COMPOSITION

STANDARDISATION

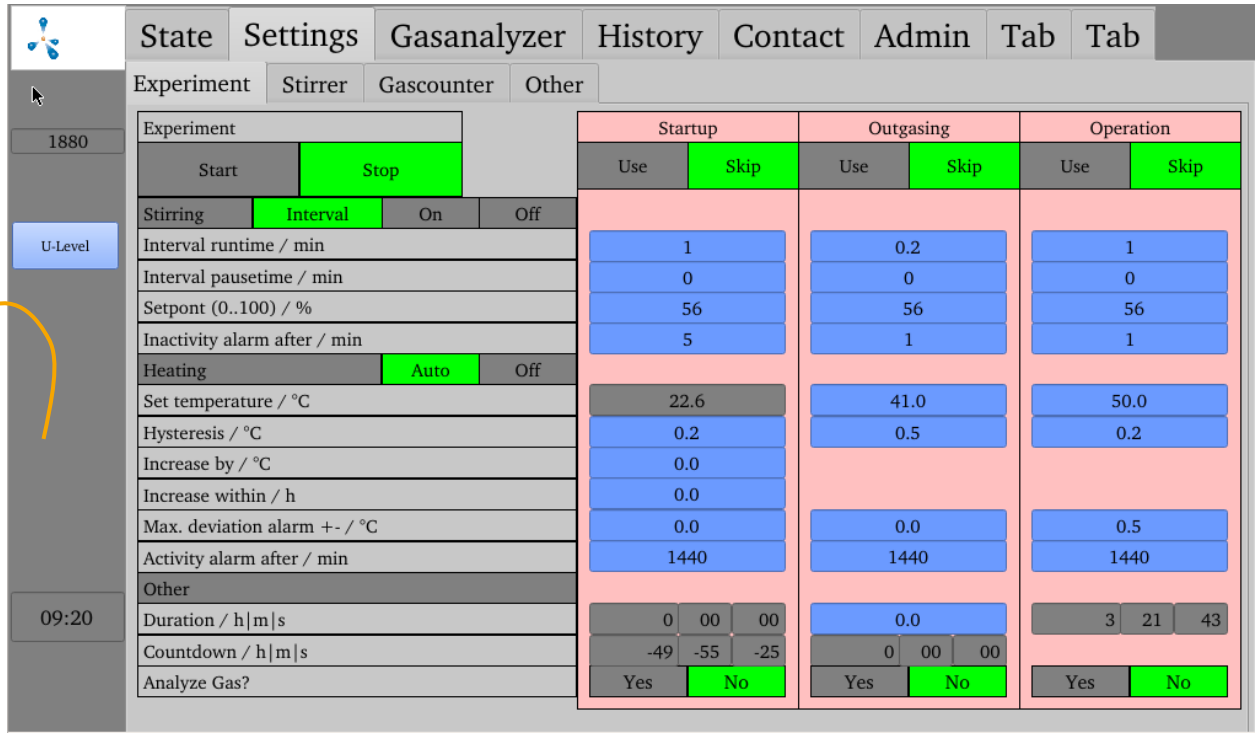


VISUALISATION & MENU NAVIGATION



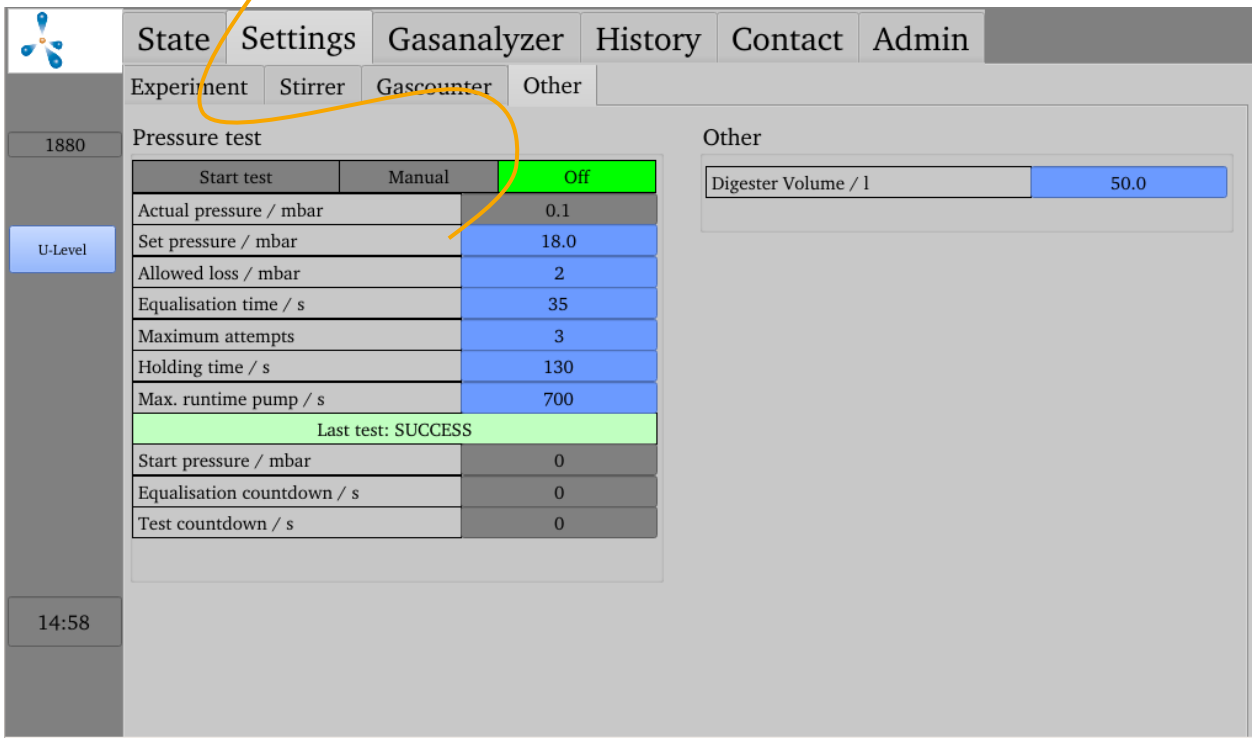
VISUALISATION & MENU NAVIGATION

INDIVIDUALLY CONTROLLABLE



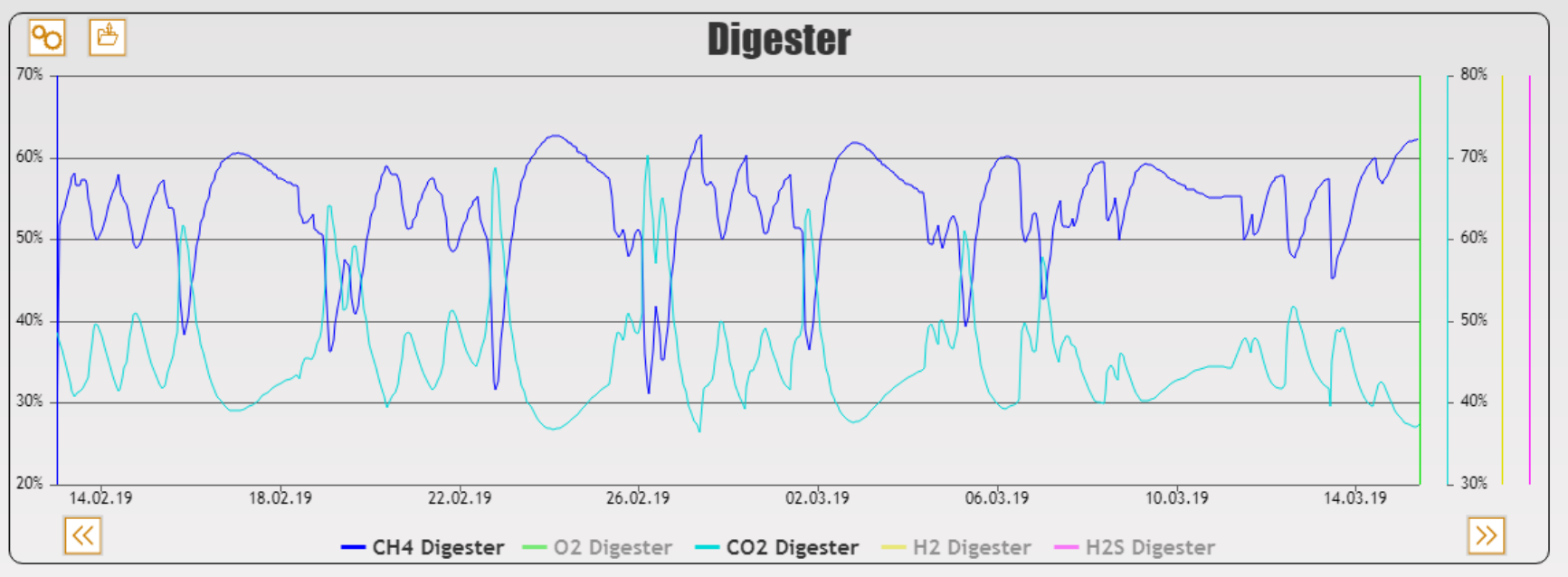
VISUALISATION & MENU NAVIGATION

INTEGRATED
PRESSURE TEST



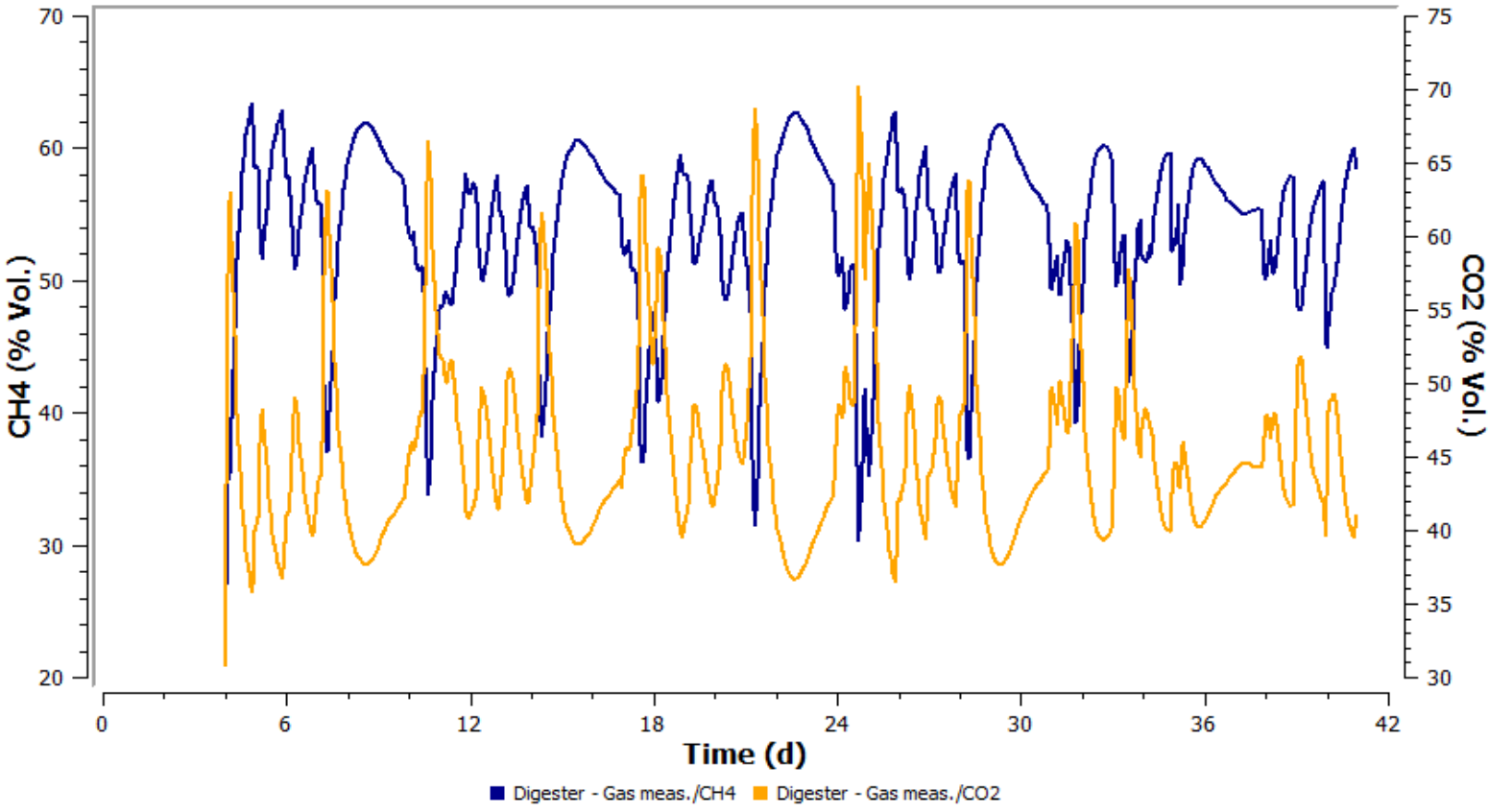
EVALUATION EXAMPLE AWICHARTS

CH4 / CO2



EVALUATION EXAMPLE AWIVIEW

CH4 / CO2



SUMMARY

compact, modular

reliable in process
all-in system

extendable
individual

multi-functional
extendable
smart/ clever
extensive/ wide

custom-made
easy to use
minimum operating effort
maximum operating safety

individual
high quality equipment
visualised

remote monitored
completely controllable
fully monitored
no additional licenses necessary

REFERENCES





LfL
Bayerische Landesanstalt für Landwirtschaft

ainia
centro tecnológico

microbEnergy
VIESSMANN GROUP

HOCHSCHULE
FÜR ANGEWANDTE
WISSENSCHAFTEN
MÜNCHEN

RUHR
UNIVERSITÄT
BOCHUM
RUB

Deutsches Biomasseforschungszentrum
gemeinnützige GmbH
DBFZ

TECHNISCHE UNIVERSITÄT
KAISERSLAUTERN

Triesdorf
BILDUNGSZENTRUM TRIESDORF

UNIVERSIDAD
COMPLUTENSE
MADRID

HOCHSCHULE
WEIHENSTEPHAN-TRIESDORF
UNIVERSITY OF APPLIED SCIENCES

Embrapa
Suínos e Aves

USC
UNIVERSIDADE
DE SANTIAGO
DE COMPOSTELA

LEHMANN
Maschinenbau GmbH

JS Industrial

TAALLEAO AND SCHLEE

nærenergi

YARA

JUNTA DE
EXTREMADURA

Bauhaus-
Universität
Weimar

AWITE BIOENERGIE GMBH
INFO@AWITE.DE | WWW.AWITE.COM
TEL. +49 (0)8761 / 72162-0