



TAILOR-MADE  
SOLUTIONS  
FOR SATISFIED  
CUSTOMERS.



# AGENDA



COMPANY

REFERENCES

PRODUCTS AND APPLICATIONS

TECHNICAL INFORMATION



# AWITE – **WHO** WE ARE AND **WHAT** WE DO



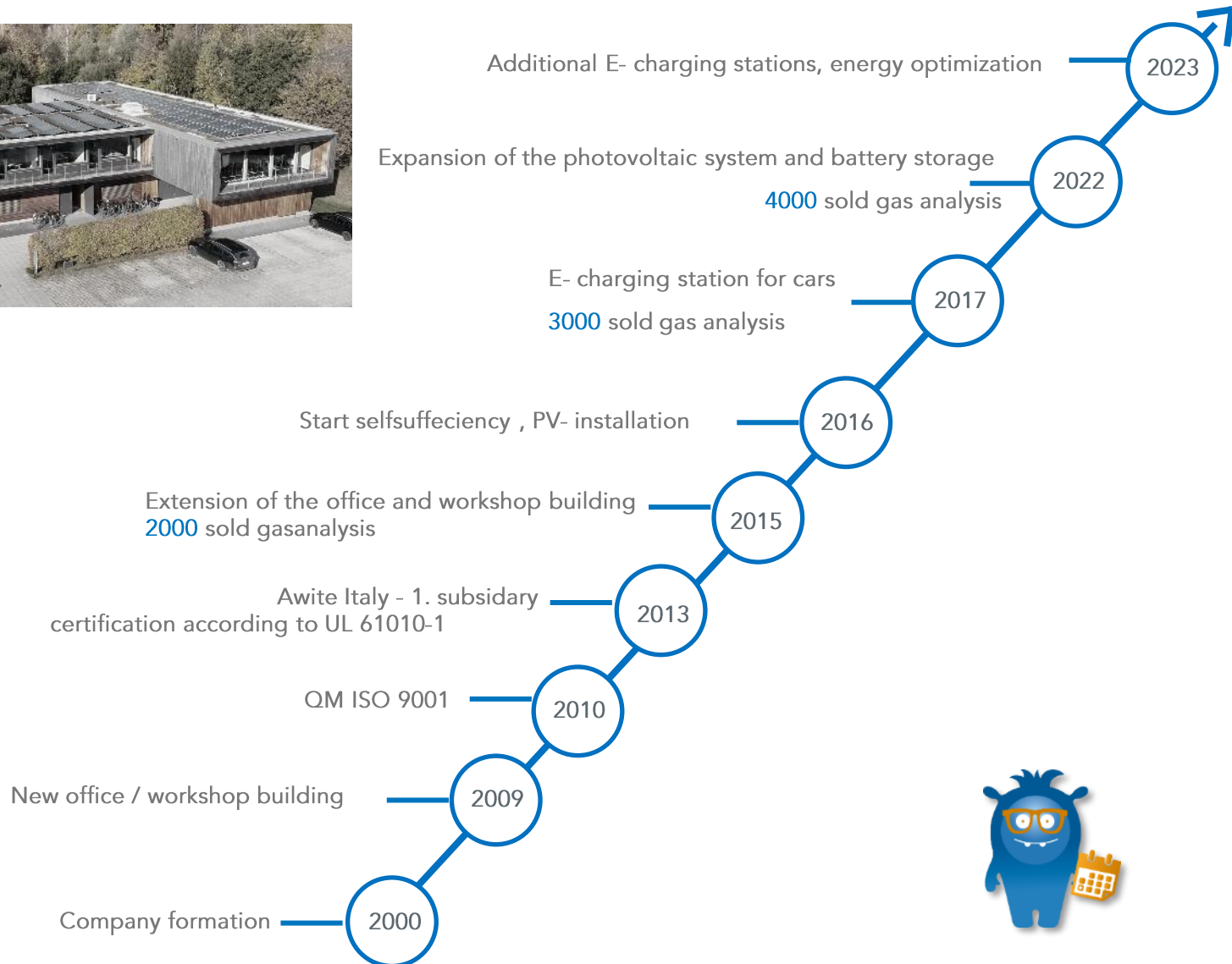
## This is us ...

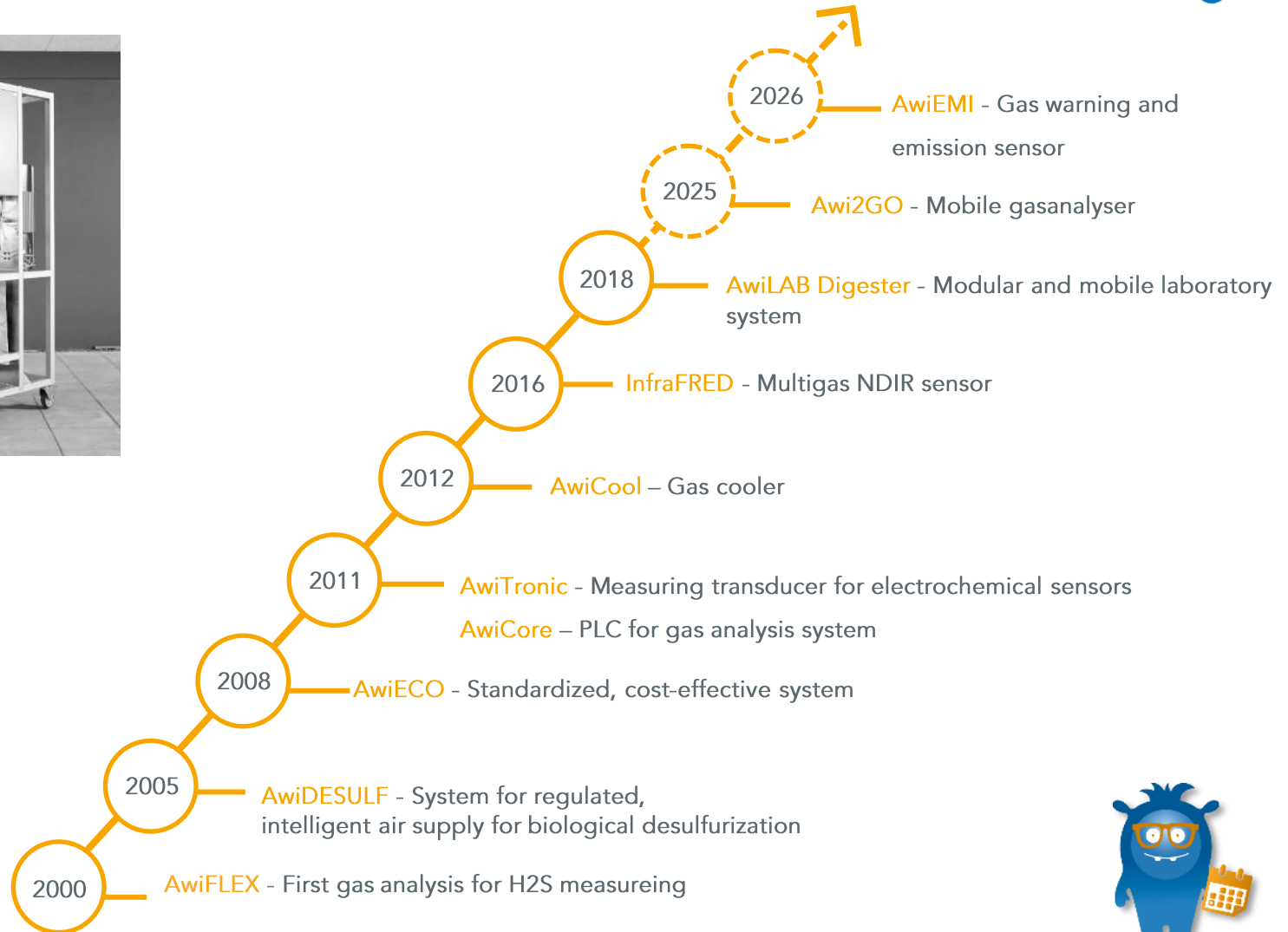
- Medium-sized, bavarian technology-enterprise
- With own development & production

## ...and this is what we do!

- Customer specific gas analysis systems of the highest quality for the renewable application areas of bio gas, biogas processing, Power-to-gas, sewage gas, dry fermentation, landfill gas, syngas, laboratory systems...

# HISTORY AND TIMELINE OF AWITE



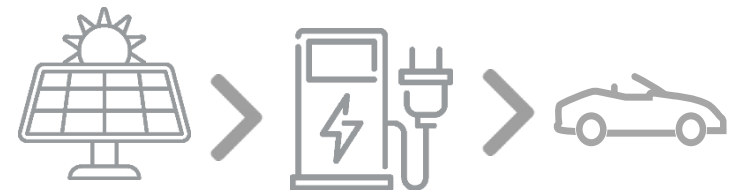




# COLLEAGUES – MOTIVATION & EFFICIENCY



# WORKPLACE – MODERN & ECOLOGIC







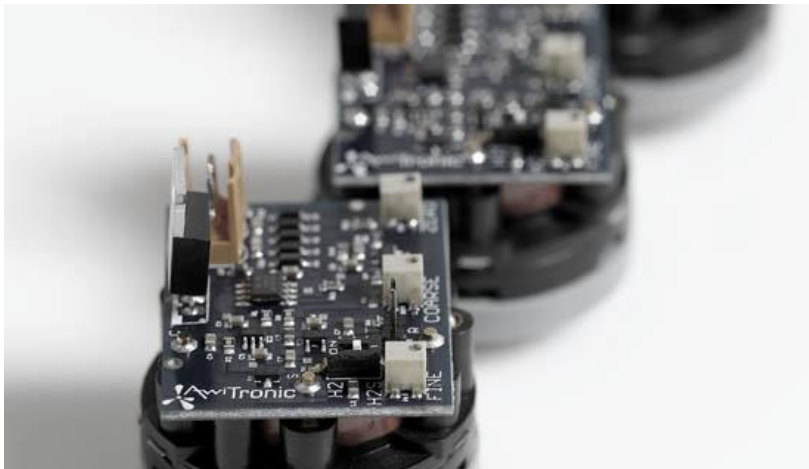
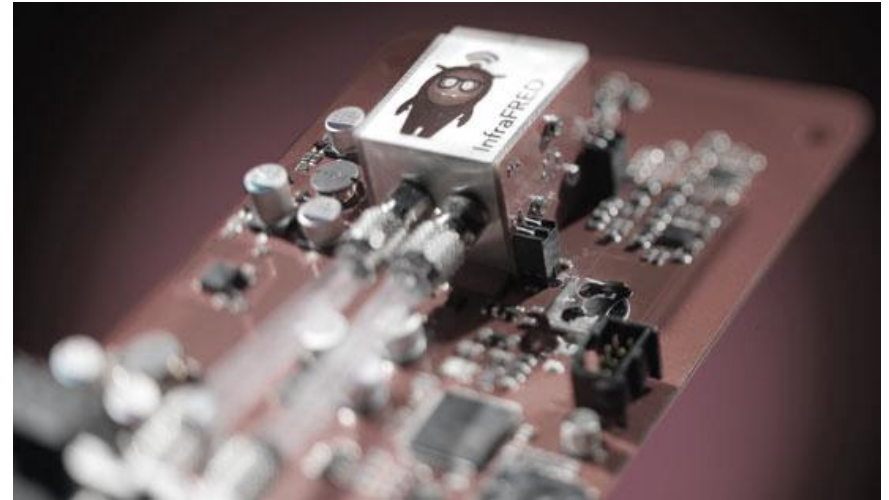


# TEAM – MOTIVATION & EFFICIENCY



# TEAM – MOTIVATION & EFFICIENCY







# OUR PARTNERS– EUROPE



MB Biogalia



ODS Metering Systems

klöckner & co



# OUR PARTNERS – NORTH- AND SOUTH AMERICA



# OUR PARTNERS – SOUTH EAST ASIA / AUSTRALIA



Quality & Innovation





# AGENDA

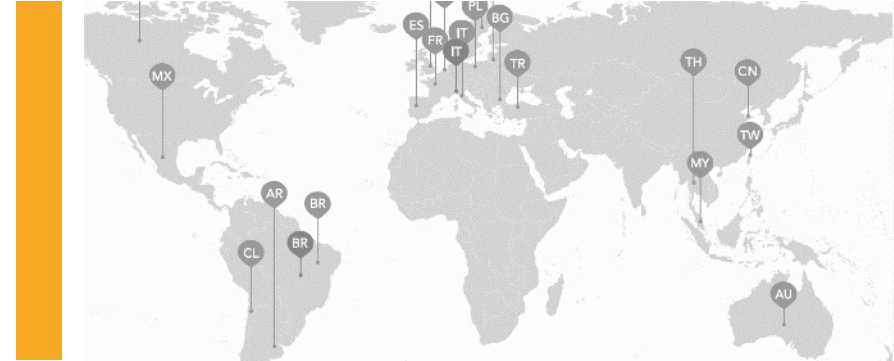


COMPANY

REFERENCES

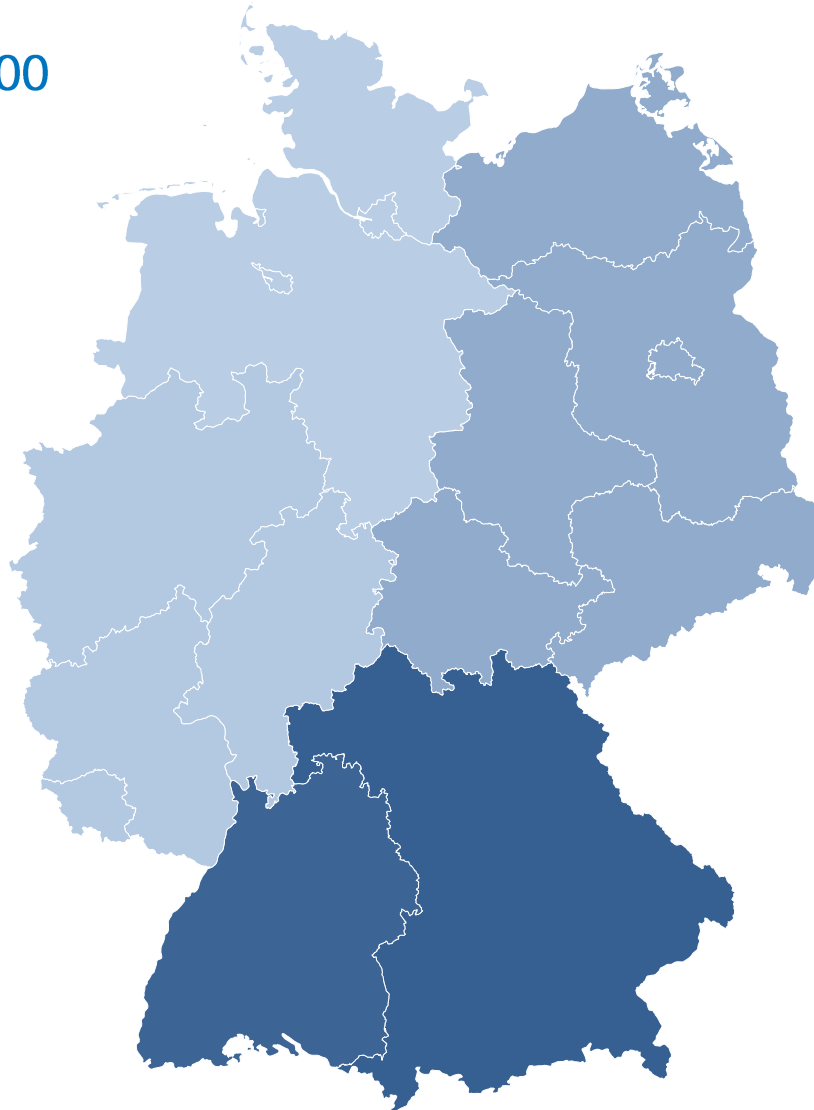
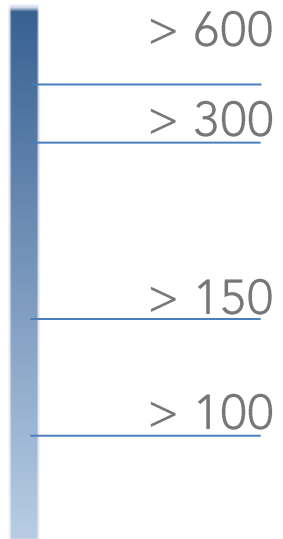
PRODUCTS AND APPLICATIONS

TECHNICAL INFORMATION



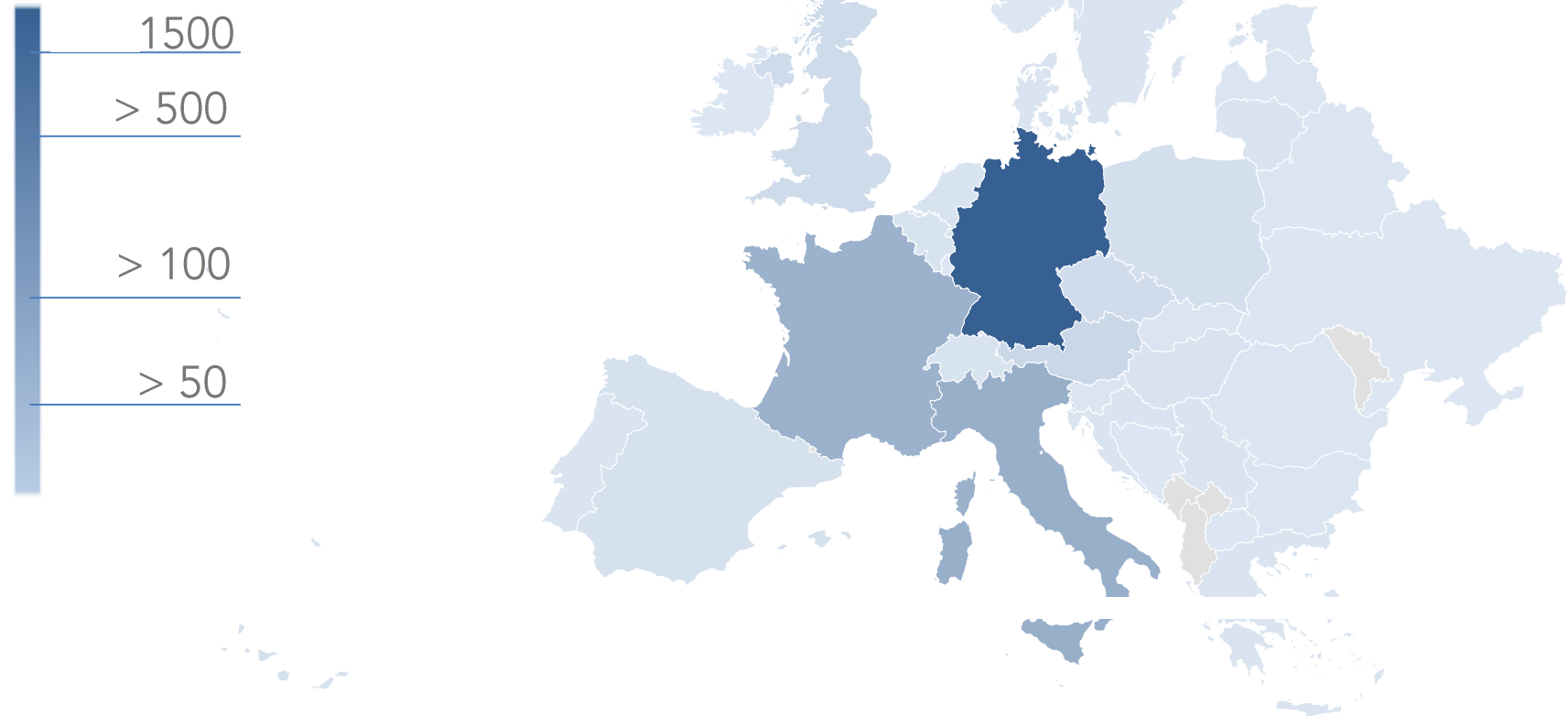
# REFERENCES – 2024

■ Gas analysis in Germany: >1600



# REFERENCES – 2024

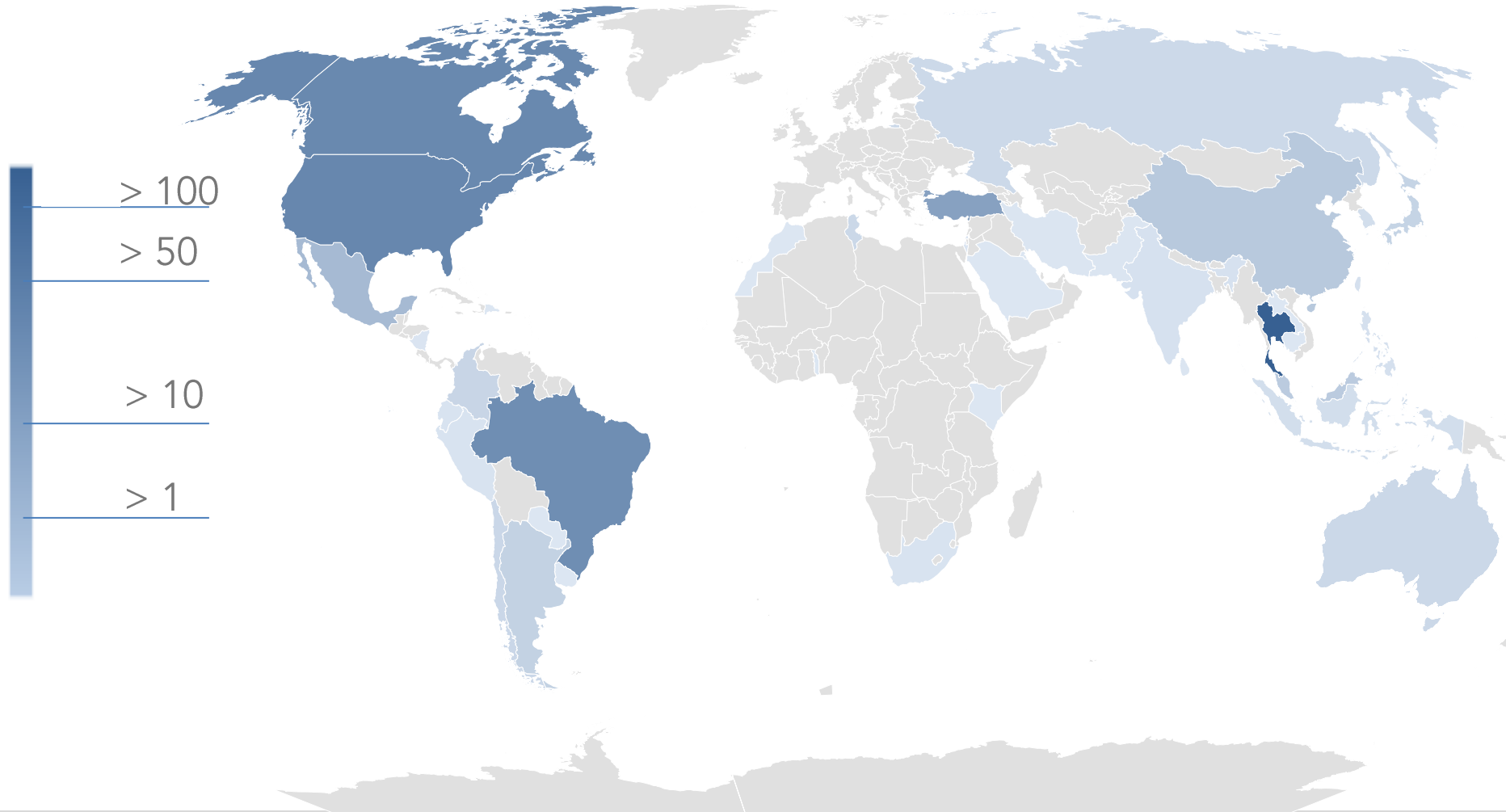
■ Gas analysis in Europe: >3900



# REFERENCES – 2024

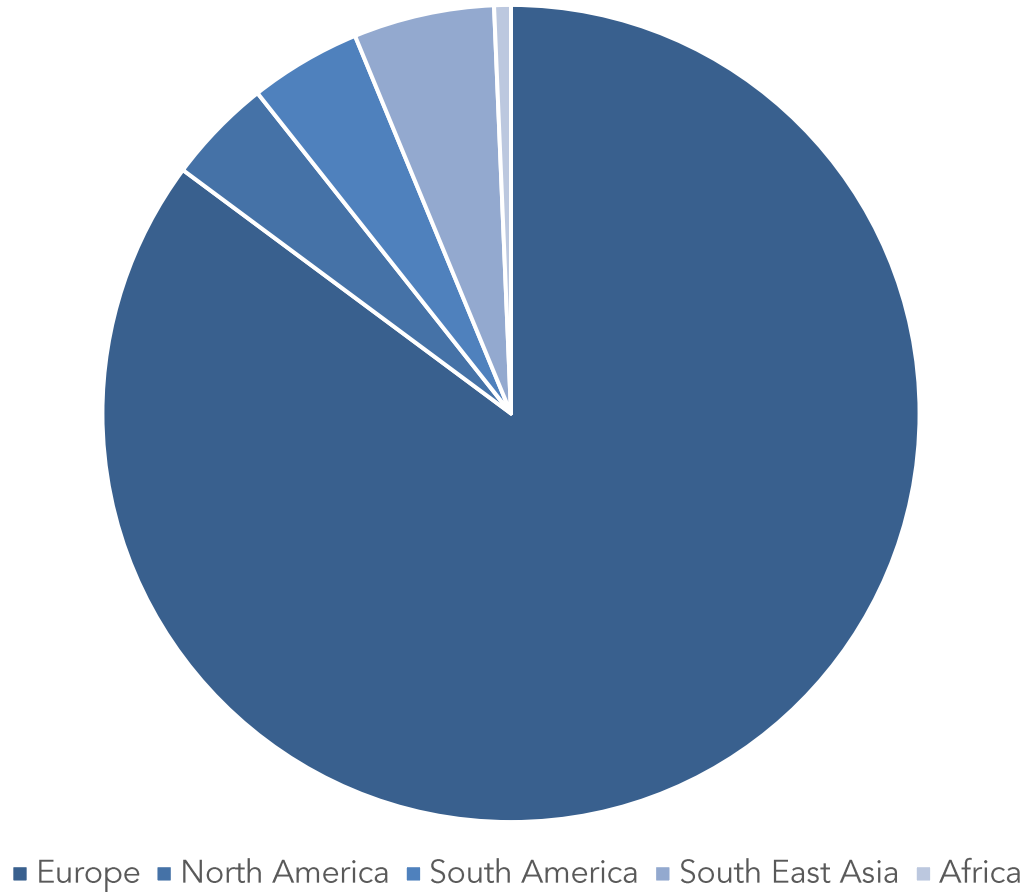


Gas analysis worldwide: : >700





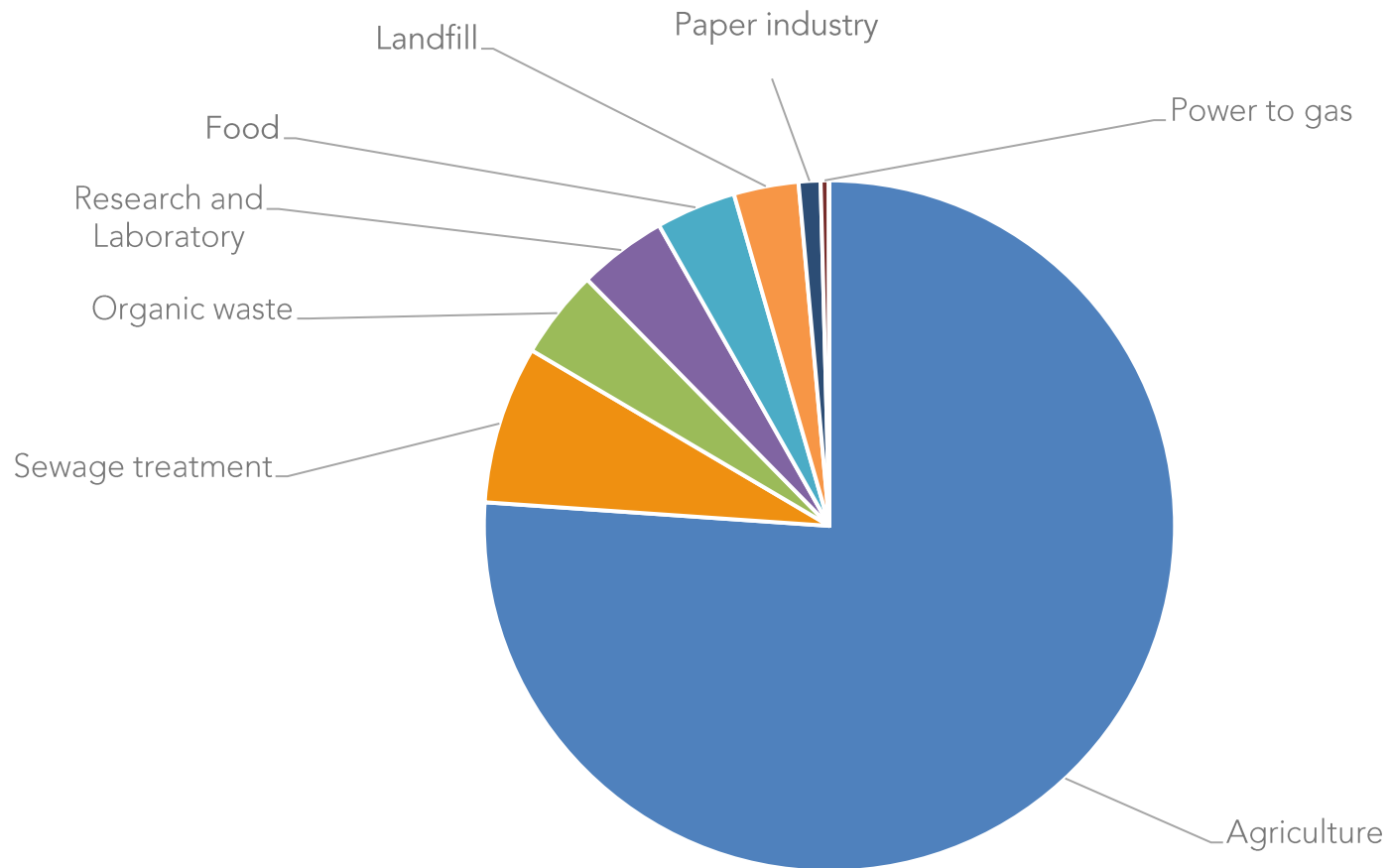
Installed gas analyses in total : >4600



# REFERENCES – 2024 APPLICATIONS



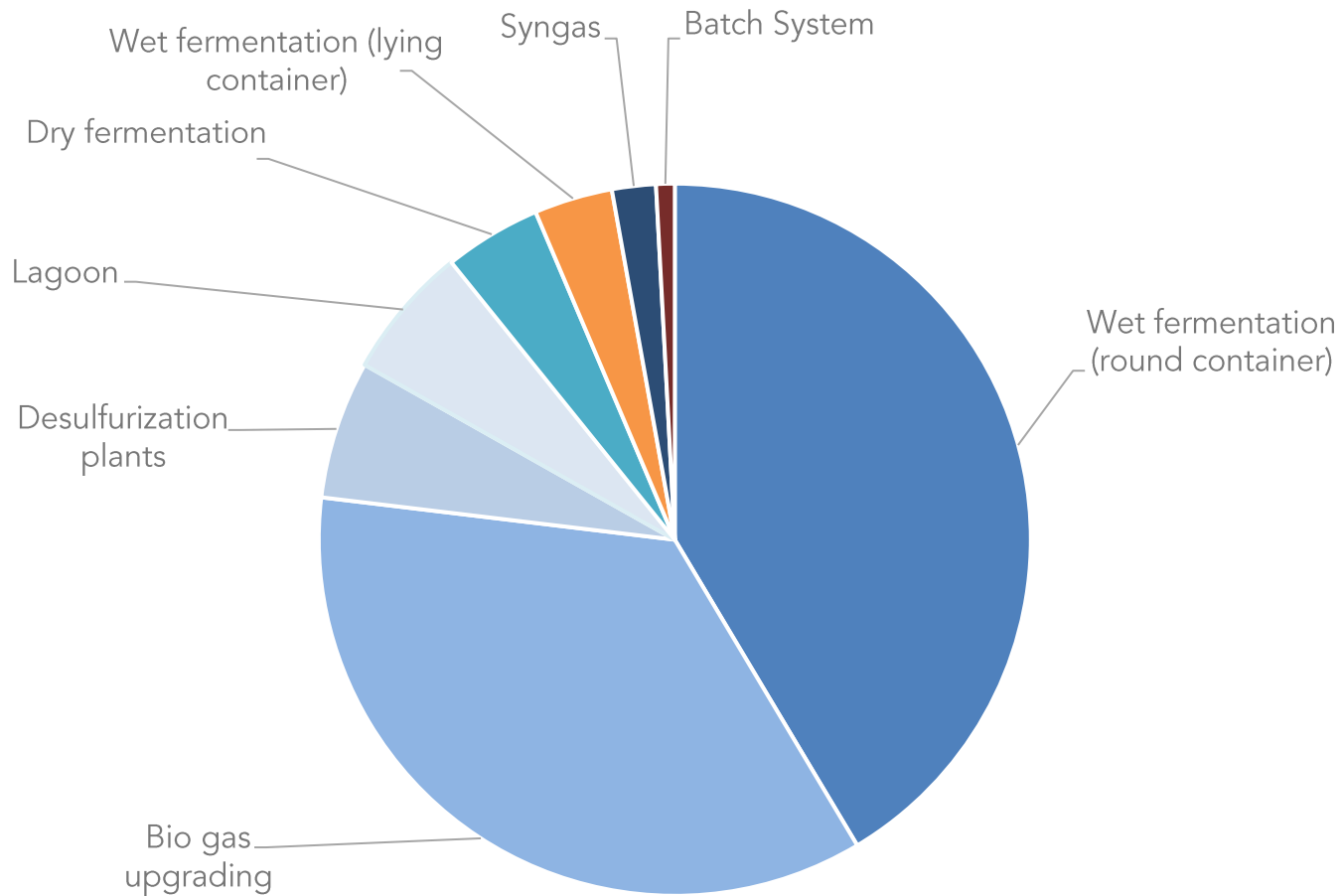
Industry



# REFERENCES – 2024 APPLICATIONS



## Procedure type



# AGENDA



COMPANY

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TECHNICAL INFORMATION



# PRODUCTS



 GAS ANALYSIS



 DESULFURIZATION



 FLOW MEASUREMENT



 LABORATORY  
EQUIPMENT



 SERVICE



## ANALYZE GASES WITH AWIECO AND AWIFLEX



A SUITABLE ANALYSIS – FOR  
EVERY PROCESS



### AWIECO

COMPACT  
COST - EFFECTIVE  
STANDARDIZED



### AWIFLEX & AWIFLEX XL

INDIVIDUAL  
MULTI – FUNCTIONAL  
EXPANDABLE

# GAS ANALYSIS



| <div>Technical information </div> | AWIECO | AWIFLEX | AWIFLEX XL |
|--------------------------------------------------------------------------------------------------------------------|--------|---------|------------|
| 1 to 2 measuring points                                                                                            | ✓      | ✓       | ✓          |
| Multiple Measuring points                                                                                          | ✗      | ✓       | ✓          |
| AwiDESULF                                                                                                          | ✗      | ✓       | ✓          |
| SIL 1 for O2 measurement                                                                                           | ✗      | ✓       | ✓          |
| Ex zone 2 certification                                                                                            | ✗      | ✓       | ✓          |
| Continuous measurement                                                                                             | ✗      | ✓       | ✓          |
| Parallel measurement possible                                                                                      | ✗      | ✗       | ✓          |

## + Maintenance free gas cooler

Measurement accuracy  
Lifespan  
No wear



## + Closed stainless steel housing

Security  
Measurement accuracy  
No pollution



## + Touch-Panel

Simple operation  
Graphical & tabular display  
Menu multilingual

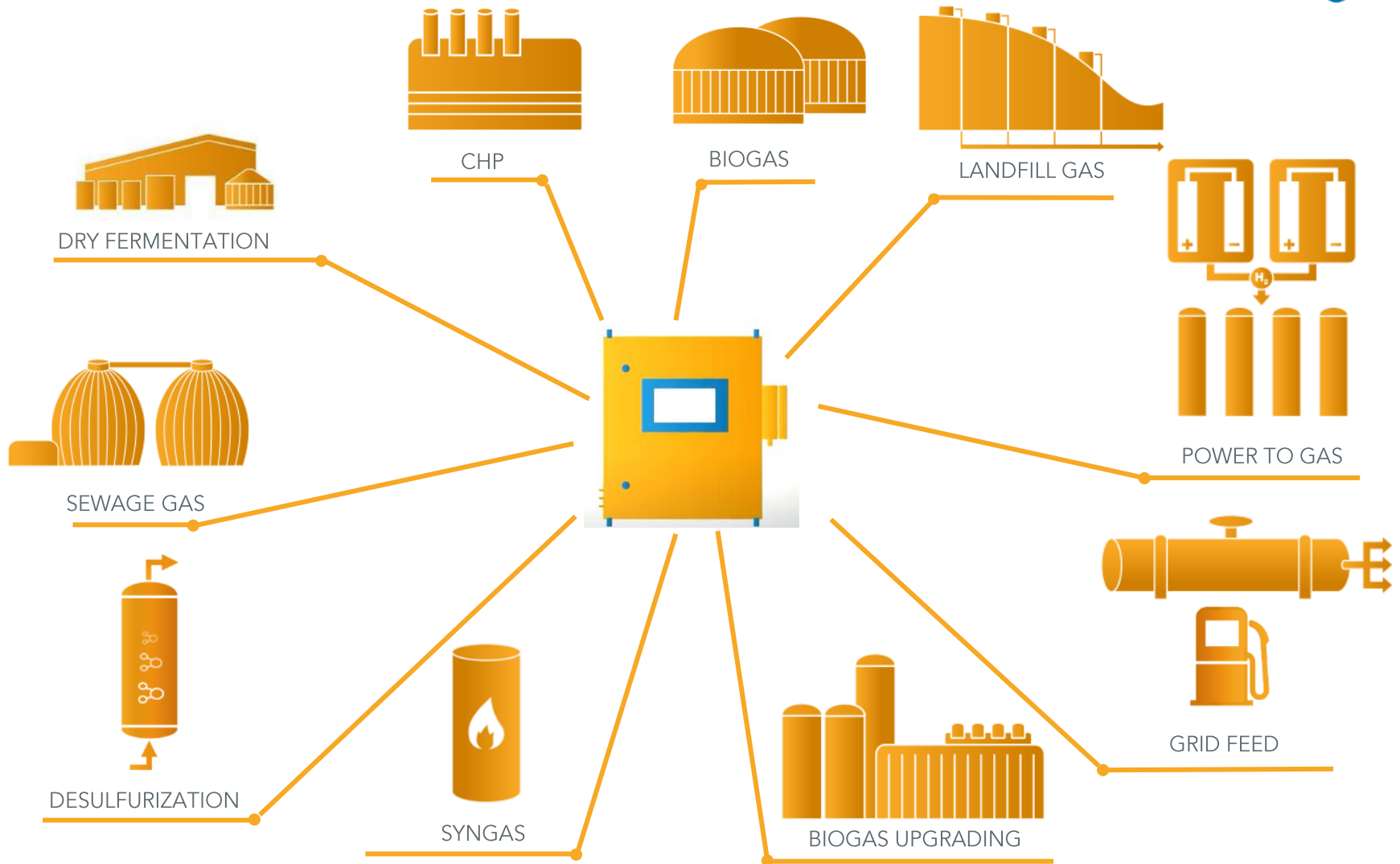


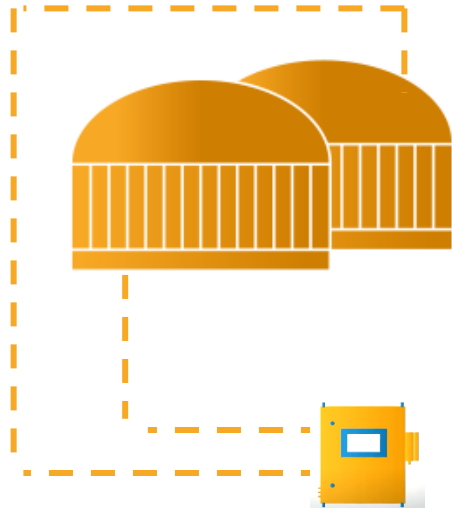
## + Expandable

Flow, temperature, pressure and  
humidity sensor  
Desulfurization system (AwiDESULF)



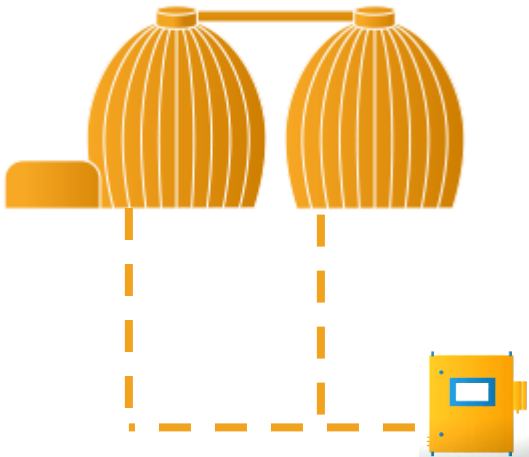
# APPLICATIONS





## Measurement of $\text{CH}_4$ / $\text{CO}_2$ / $\text{H}_2$ / $\text{H}_2\text{S}$ / $\text{O}_2$

- process control
- regulated  $\text{O}_2$ - and air dosing
- oxygen limit monitoring
- desulfurization result,  $\text{H}_2\text{S}$  limits
- ex-protection (impermeability air-supported roof etc.)
- gap monitoring air supported roof
- monitoring during substrate change  $\text{CH}_4$ ,  $\text{H}_2$
- response from procedural settings, e. g. stirring times



Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{H}_2$  /  $\text{H}_2\text{S}$

- process control
- load detection during co-fermentation
- reaction of desulfurizing products

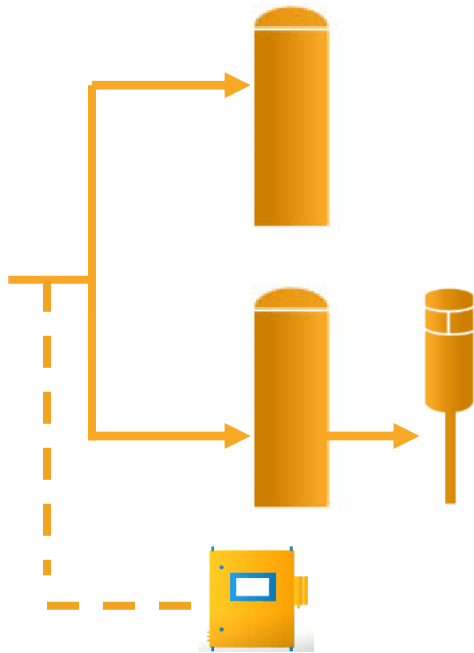




Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{H}_2$  /  $\text{H}_2\text{S}$  /  $\text{O}_2$

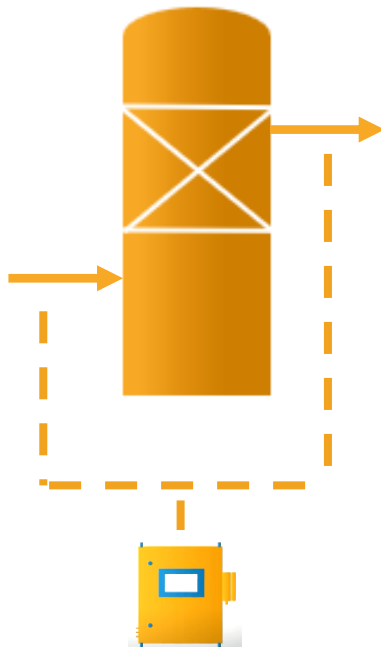
- process control
- start of the process (close the garage)
- process end (open garage)
- quality control for gas utilization

# APPLICATION: DRY FERMENTATION



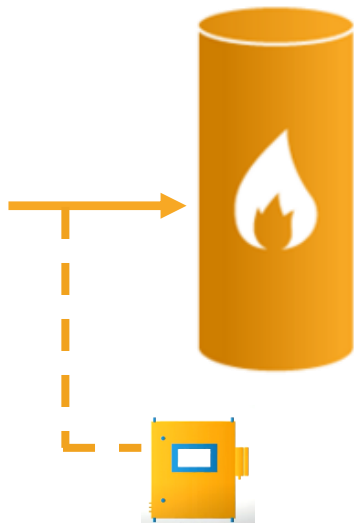
Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{H}_2\text{S}$  /  $\text{O}_2$

- Process control
- „good“ gas into process
- „bad“ gas to the torch



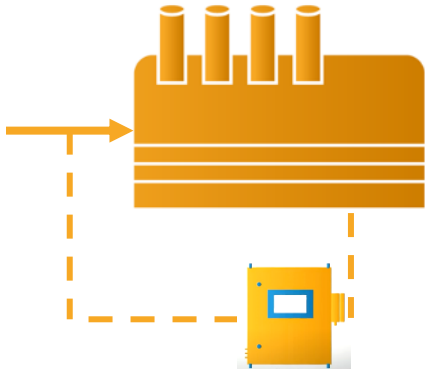
## Measurement of $\text{H}_2\text{S}$ / $\text{O}_2$

- microbiological desulfurization
- oxygen demand activated carbon
- higher lifetime activated carbon
- best possible reaction
- planable activated carbon replacement
- $\text{O}_2$ -consumption / residual content
- monitoring of limits
- avoidance of overheating
- biological optimization



Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{CO}$  /  $\text{H}_2$  /  $\text{H}_2\text{S}$  /  $\text{O}_2$

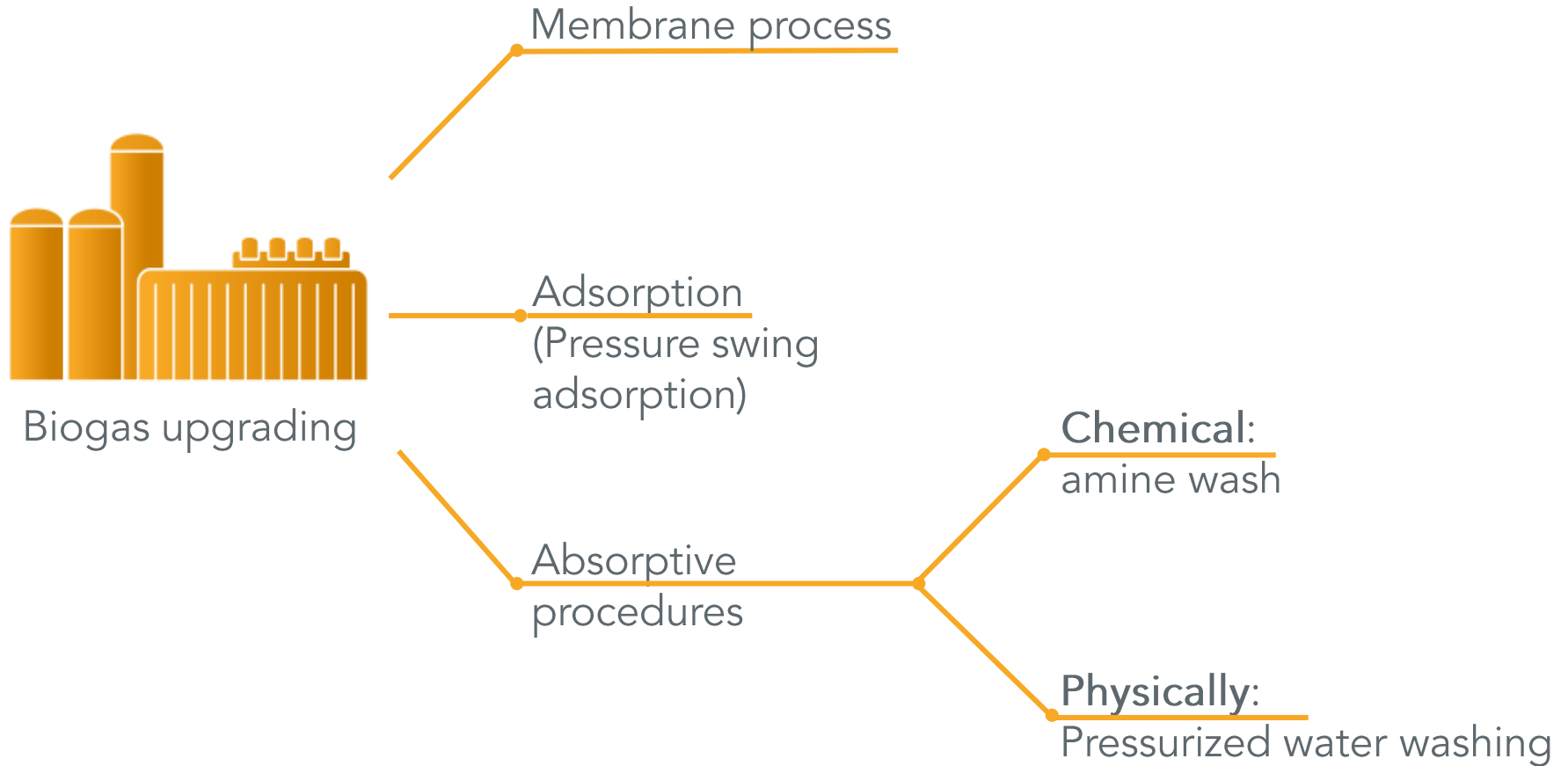
- process control
- process optimisation
- $\text{O}_2$  feed



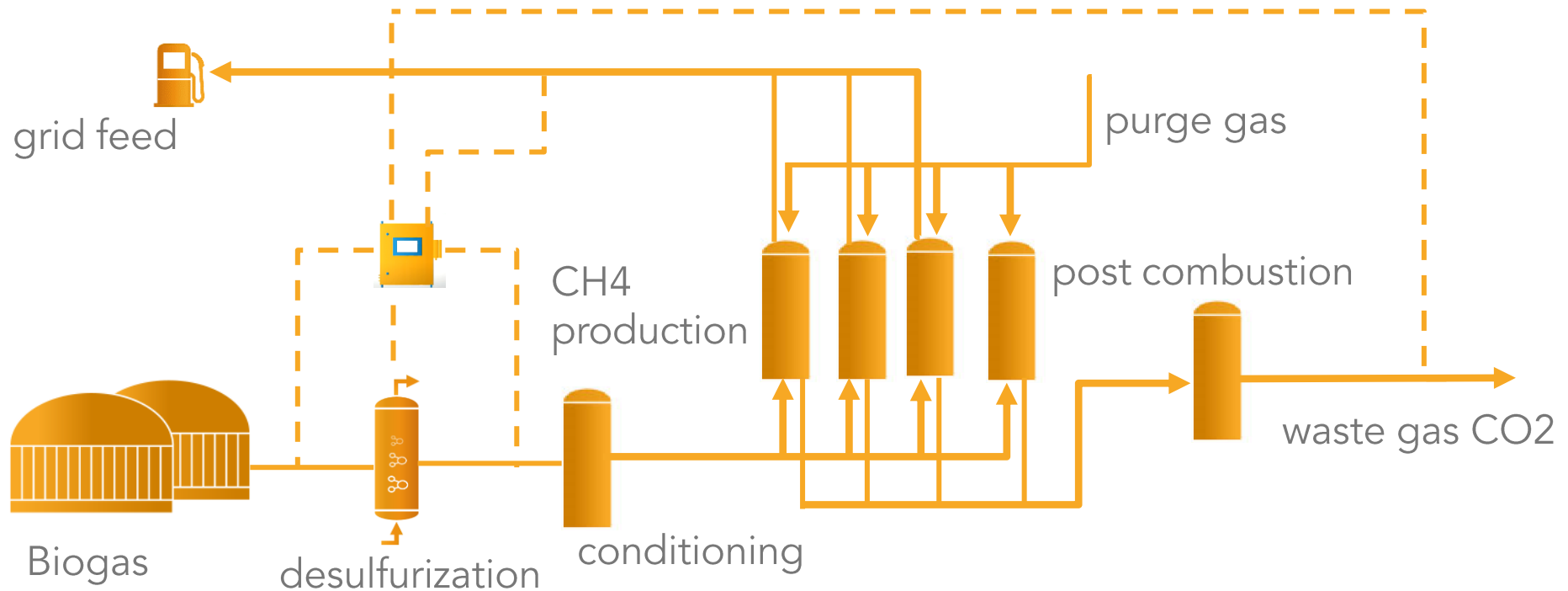
Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{H}_2\text{S}$  /  $\text{H}_2$  /  $\text{O}_2$

- CHP-start / mixture setting
- reduction of wearing parts
- engine oil life monitoring
- CHP-manufacturer specification
- Protection of oxiate and exhaust gas heat exchanger
- machinery breakdown ensurance
- warranties

# APPLICATION: BIOGAS UPGRADING

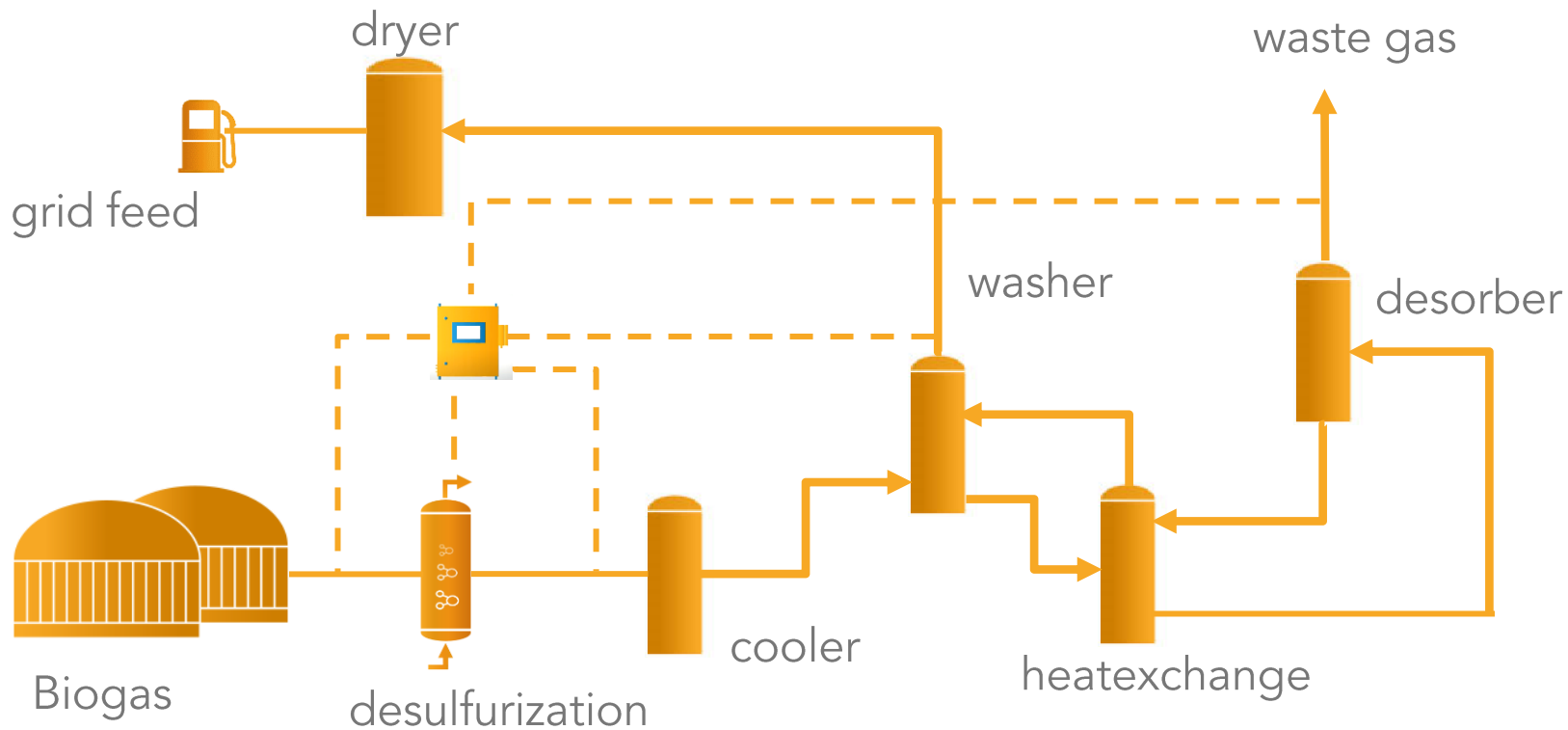


# PRESSURE SWING ADSORPTION (PSA)

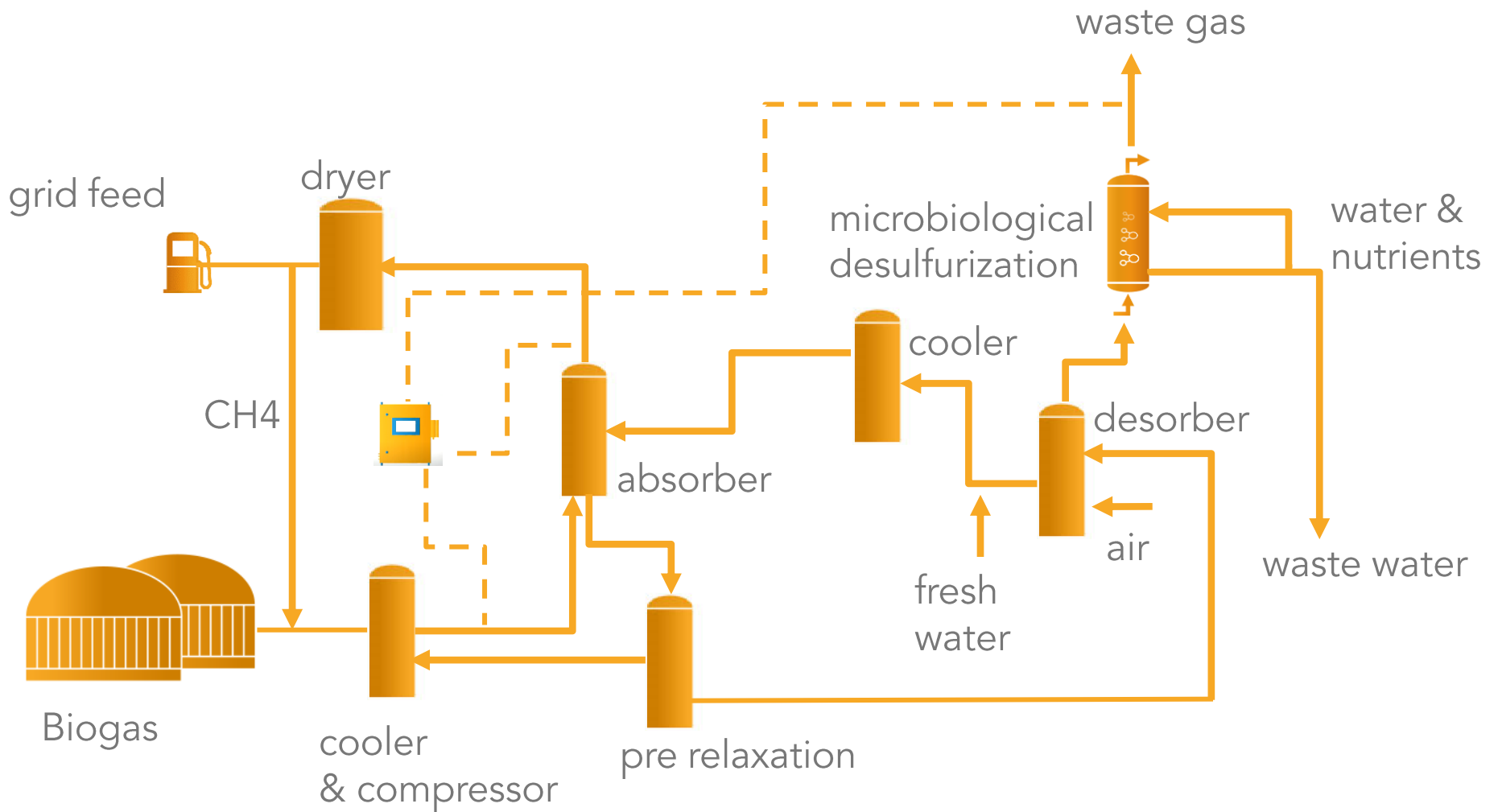


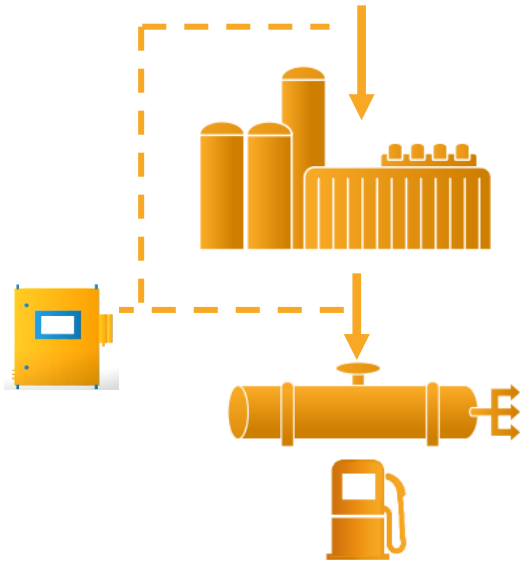


# AMINE WASH



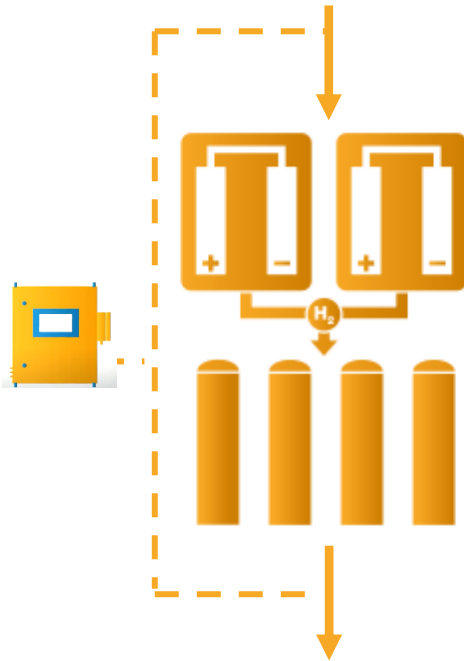
# PRESSURIZED WATER WASHING (DWW)





## Measurement of $\text{CH}_4$ / $\text{CO}_2$ / $\text{O}_2$ / $\text{H}_2\text{S}$ / $\text{H}_2$

- suitable for all sorts of biogas treatment
- process control of preparation process
- monitoring activated carbon / raw gas cleaning
- acceptance quality of raw gas input
- low calorific gas  $\text{CH}_4$  /  $\text{CO}_2$  limit values
- internal process control
- delivery of biomethane – gas supply, consumer



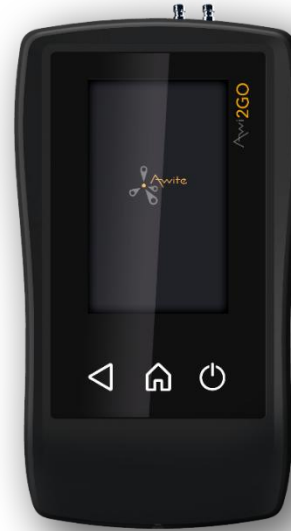
Measurement of  $\text{CH}_4$  /  $\text{CO}_2$  /  $\text{O}_2$  /  $\text{H}_2$  /  $\text{H}_2\text{S}$

- process control
- control of educt gases
- mixture of  $\text{CO}_2$  or biogas with  $\text{H}_2$
- raw biogas quality
- controll of product gases
- control of any downstream cleaning or feeding into the gasgrid

Analyse gases with  
**AWI2GO**



MOBILE GAS ANALYSIS MADE  
EASY – WITH AWI2GO



## AWI2GO

INTUITIVE & SMART USE  
SWITCH ON & GET STARTED  
SAFER 6 – MEASUREMENT IN RECORD  
TIME

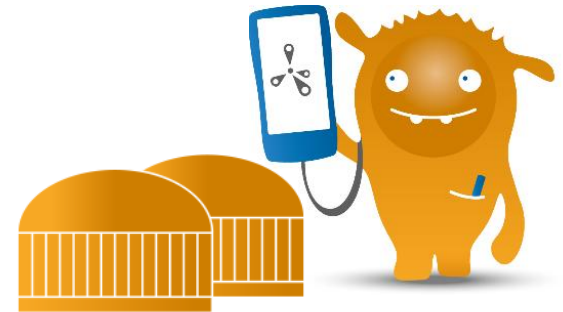
# MOBILE GASANALYSER



6 readings in 60 seconds  
CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>S, CO, H<sub>2</sub>



Language talent (DE, EN, FR, IT, BR)



Ex zones 1 & 2 approval

# MOBILE GASANALYSER



Everything is ready to hand thanks to the suitcase calibration set, measuring point connection set and external temperature sensor



Large storage space for up to 2,000 systems, 4,000 measuring points, 75,000 measured values and 5,000 messages

DESULFURIZE  
BIOLOGICALLY  
WITH AWIDESULF



NEVER TOO MUCH O<sub>2</sub> IN THE  
SYSTEM – WITH CERTAINTY



AWIDESULF  
100/200 NM<sup>3</sup>/H

INDIVIDUEL  
EXACT  
COST - EFFICIENT



AWIDESULF  
300/500/1000 NM<sup>3</sup>/H

INDIVIDUEL  
EXACT  
COST - EFFICIENT



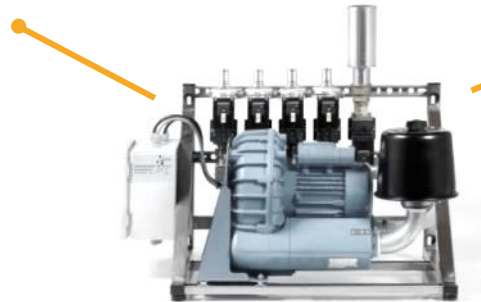
# MICROBIOLOGICAL DESULFURIZATION



Technical specifications



Control range in automatic mode between 0 – 1 % O<sub>2</sub> depending on the measured H<sub>2</sub>S-concentration (shutdown limit: 2,4 % O<sub>2</sub>)



Individual control of several fermenter



Certified for the north american market

automatic control of the air supply through a combination of PI control and a higher- level fuzzy logic

Individually, exact, cheap

⊕ process stability



⊕ minimal running costs



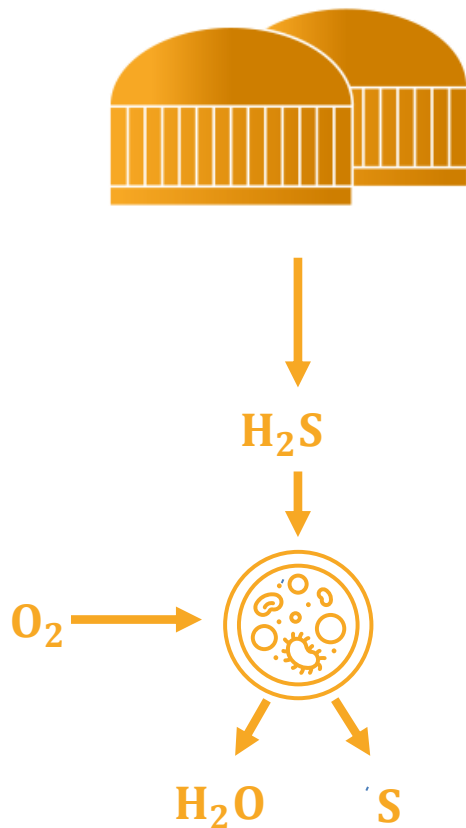
⊕ also regulates precisely in the event of fluctuations amount of gas generated



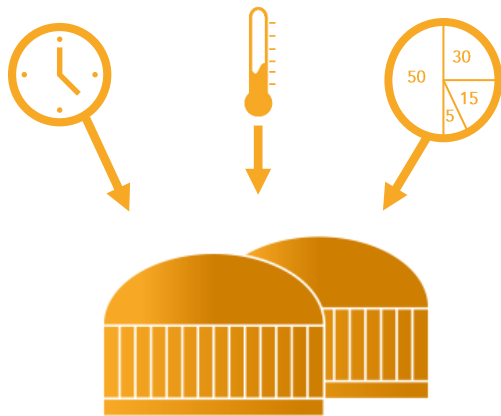
⊕ remote maintenance



# MICROBIOLOGICAL DESULFURIZATION

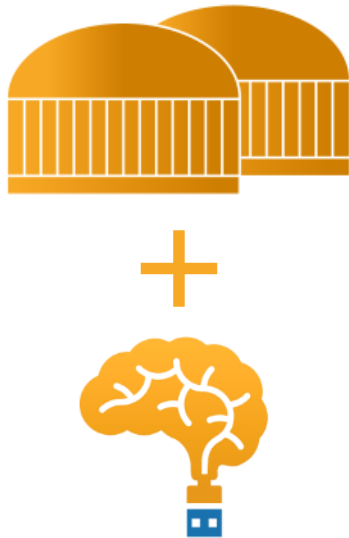


- by autotrophic sulfur bacteria
- oxidation of  $\text{H}_2\text{S}$  to elemental sulfur
- within gas phase, boundary layer liquid/gaseous
- no special bacteria
- no additional tanks, parts, etc.
- external unit (better technical design but more expensive)



Depending on:

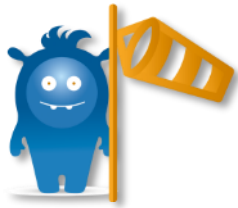
- dwell time
- surface/ interface
- temperature
- nutrient
- distribution, mixture
- dry substance, structur
- efficiency up to 99%



## AwIDESULF...

- measures  $\text{H}_2\text{S}$  and  $\text{O}_2$
- Controls  $\text{O}_2$  setpoint/ $\text{O}_2$  limitation to avoid corrosion
- Regulates the air supply according to the current gas productionvermeidet- avoids manual action
- Pure oxygen for processing plants  
... is always combined with AwiFlex

MEASURE MORE  
PRECISELY  
WITH **AWIFLOW**



HIGHEST PROCESS ACCURACY  
STABLE PROCESSES



**AWIFLOW – FLOW  
MEASUREMENT**

INTELLIGENT  
COMPACT  
ROBUST

# FLOW MEASUREMENT



Installation overview



High resistance— even with moist gas containing hydrogen sulfide

Compensation for fluctuating gas properties in connection with AwiFLEX and AwiECO

intelligent, compact, cost - efficient



Increasing the measurement accuracy by calibrating on real gas

Simple installation in pipe sizes from DN 50 to DN 350

Determination of water content, standard flow and, if necessary, energy flow

Cleaning and replacement of the sensor without loss of gas

- ⊕ Balancing material and energy flows
- ⊕ Standard flow determination by integrated moisture correction
- ⊕ Possibility of proof of produced amount of gas
- ⊕ Approval ExZone 1
- ⊕ Can be used anywhere due to low pressure loss, wide temperature range and high durability





## LABORATORY EXPERIMENTS

### AWILAB PRODUCT FAMILY



SPECIALLY FOR YOUR  
LABORATORY  
APPLICATIONS IN THE  
BIOGAS SECTOR



### AWILAB GASANALYSER

INDIVIDUALLY  
AUTOMATED  
EXPANDABLE



### AWILAB DIGESTER

MODULAR WITH UP TO  
7 FERMENTERS

# LABORATORY EQUIPMENT



Small  
batch  
tests  
(1-5 L)

Customer provided



Gas production:  
Stir, heat, test jar



Awite

- Flow measurement
- Gas collection
- Automation
- Gas analysis



Our gas analysis for  
your laboratory  
system...

Continius  
large scale  
testing

Our all in one  
laboratory system  
for you



## AwifLEX

**Integrated gas analysis** with automatic phase monitoring, measurement of gas quality as well as normalization of the gas volume and automatic measuring point change

## Easily removable

Helix- agitator with specific configuration

## Maximum security

Integrated overpressure safety and condensate separator for stable process



## Completely insulated

Variable stainless steel container (20-50 l)  
With special seals, viewing glasses, individual heating program, integrated self pressure test, sampling nozzle in the most homogeneous zone and an easy-to-use filling and emptying device

## Configuration and control

Using 7 inch industrial touch panel  
For operation and visualization  
Different modes for inoculum adaption, initial phase and experimental execution possible

## Individually

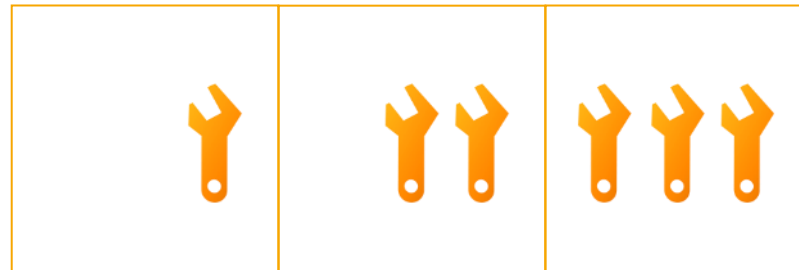
Gas volume measurement using a drum gas meter or milligas counter

- ⊕ ZReliable in the process - everything from a single source
- ⊕ Panel-PC – 7" TFT TouchPanel 800x480
- ⊕ Visualized representation, individually configurable
- ⊕ Remote access possible / controllable and controllable / fully monitored
- ⊕ User friendly / easy to use
- ⊕ Fully automated / comprehensive / intelligent / multi-functional
- ⊕ Data logging and SQL database
- ⊕ No additional software licenses required
- ⊕ Low operating costs / maximum operational reliability

COMPLETE  
SUPPORT  
WITH **AWIPLUS**



CUSTOMIZED SERVICE FOR  
YOUR GAS ANALYSIS



## AWIPLUS - SERVICEAGREEMENT

SVEN

MATS

LARS

- Fully equipped maintenance vehicles– always everything on board
- Abroad support from local partners
- Fast response times in support and shipping of spare parts
- Easy replacement of spare parts with the help of illustrated instructions



- Maintenance interval reminders
- Every project has a cv
- Telephone support from service technicians
- Various support options
  - ⊕ Data-Backup with USB
  - ⊕ AwiRemote
  - ⊕ Mail
  - ⊕ Telephone



# AGENDA

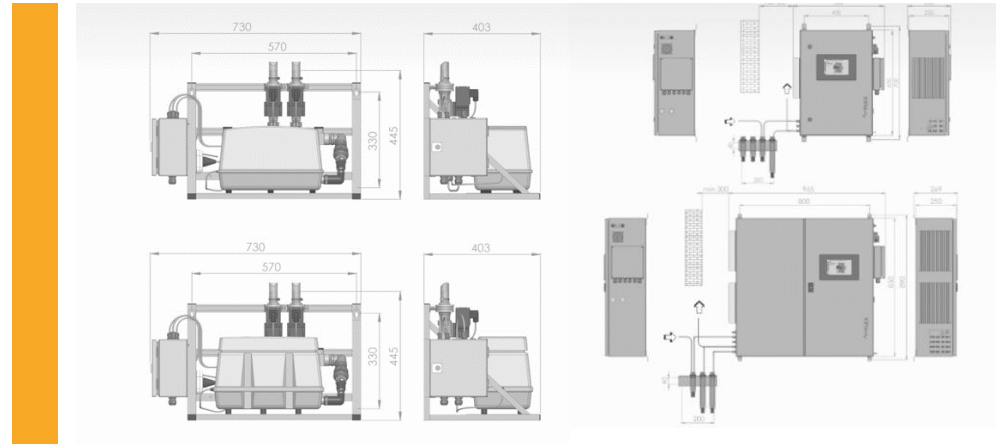


COMPANY

REFERENCES

PRODUCTS AND ALLPICATION

TECHNICAL INFORMATION





## ANALYSING GASES WITH AWIECO AND AWIFLEX



THE RIGHT ANALYSIS  
FOR EVERY PROCESS



### AWIECO

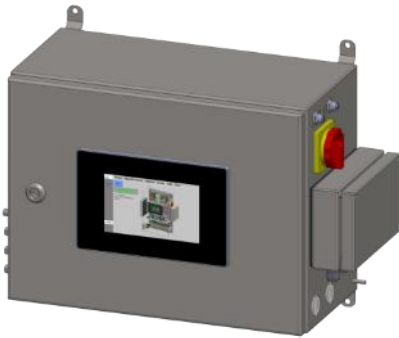
COMPACT  
COST - EFFICIENT  
STANDARDIZED



### AWIFLEX

INDIVIDUALLY  
MULTIFUNKTIONAL  
EXPANDABLE

# GAS ANALYSIS SYSTEMS



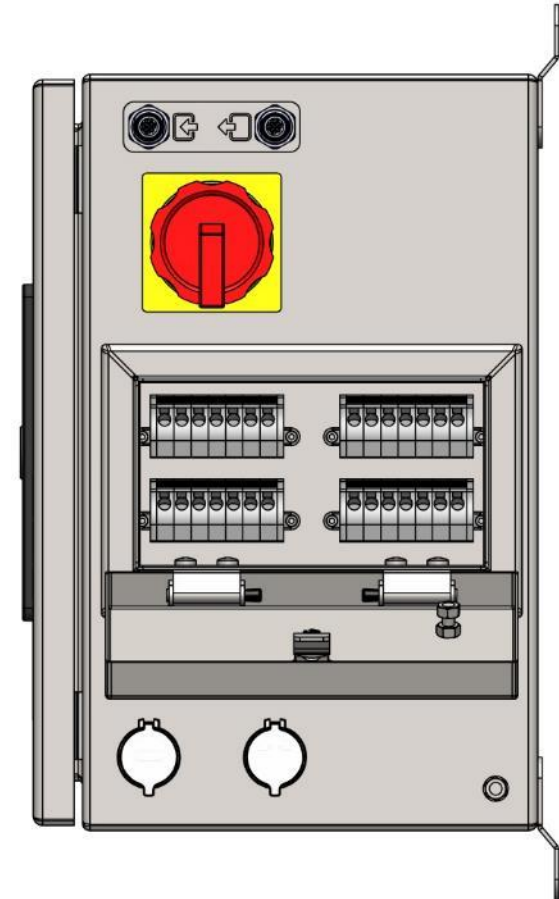
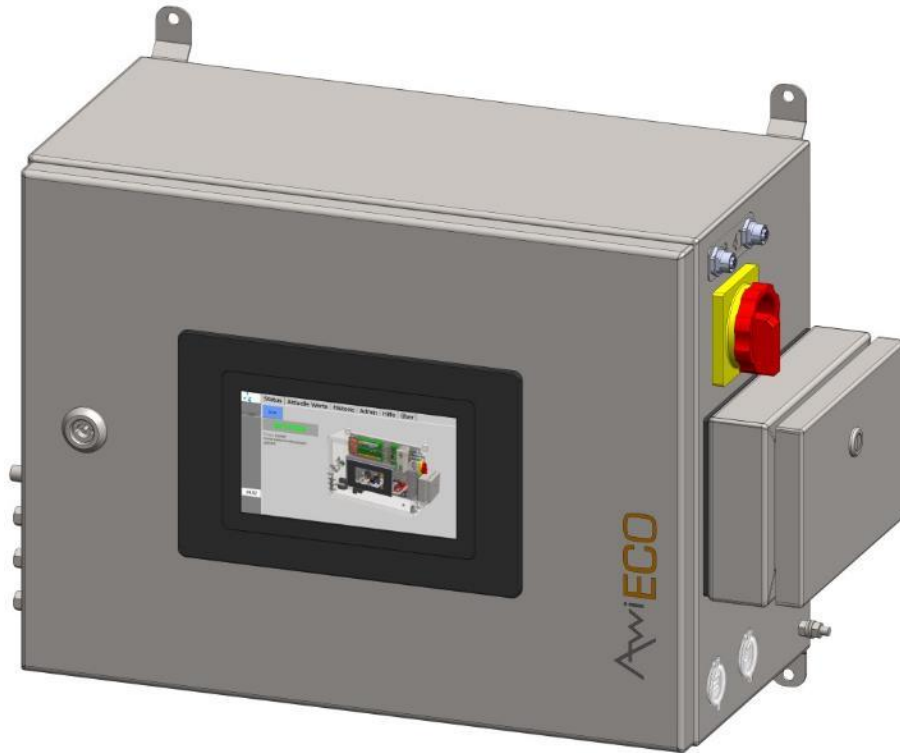
 AWIECO

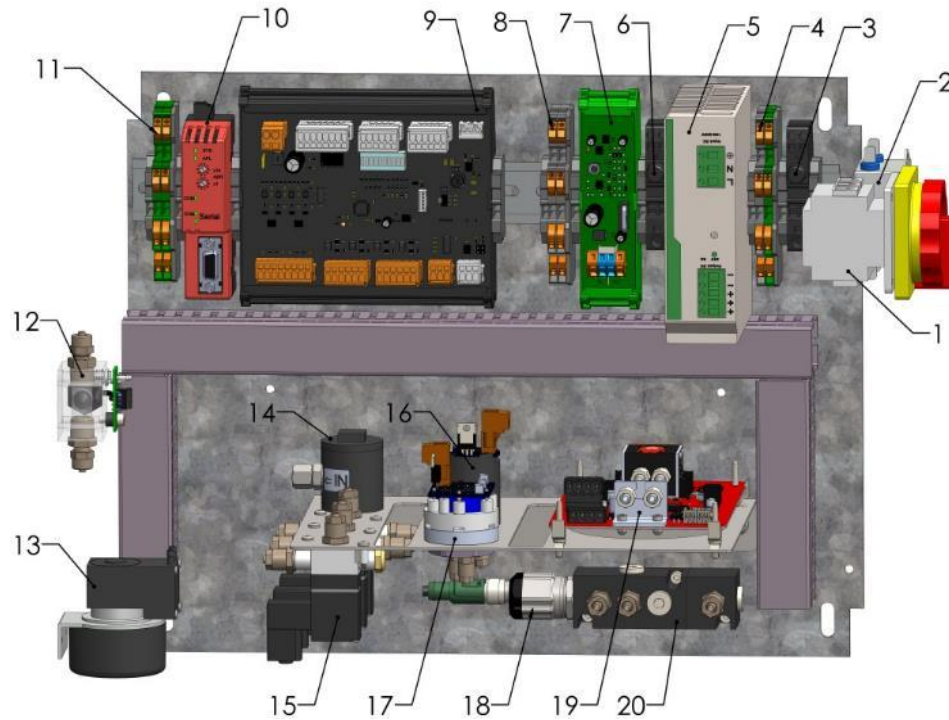


 AWIFLEX



 AWIFLEX XL



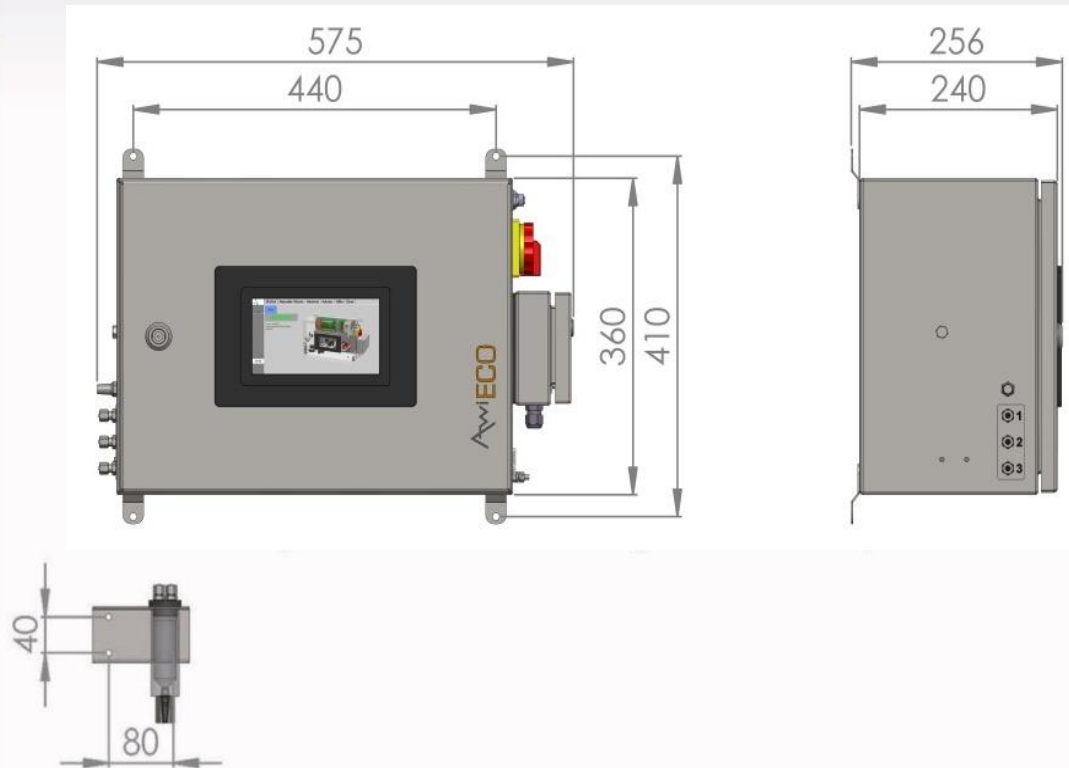


- 1 Main switch
- 2 Line filter
- 3 Fuse terminal 100 – 240 VAC
- 4 Terminal 100 – 240 VAC
- 5 Power supply unit
- 6 Fuse holder 24 VDC
- 7 AwiProtect
- 8 Terminal 24 VDC
- 9 AwILO (SPS-Modul)
- 10 Profibus-module
- 11 Terminal shielding sensors
- 12 Water sensor Awih2O
- 13 Membrane pump
- 14 Filter Awiclean
- 15 Valves
- 16 Oxygen sensor
- 17 Hydrogen sulfur sensor
- 18 Awiconnect
- 19 Multigas sensor InfraFRED
- 20 Pressure sensor

# AWIECO INSTALLATION OVERVIEW



## INSTALLATIONSÜBERSICHT / INSTALLATION OVERVIEW AWIECO Information Installation



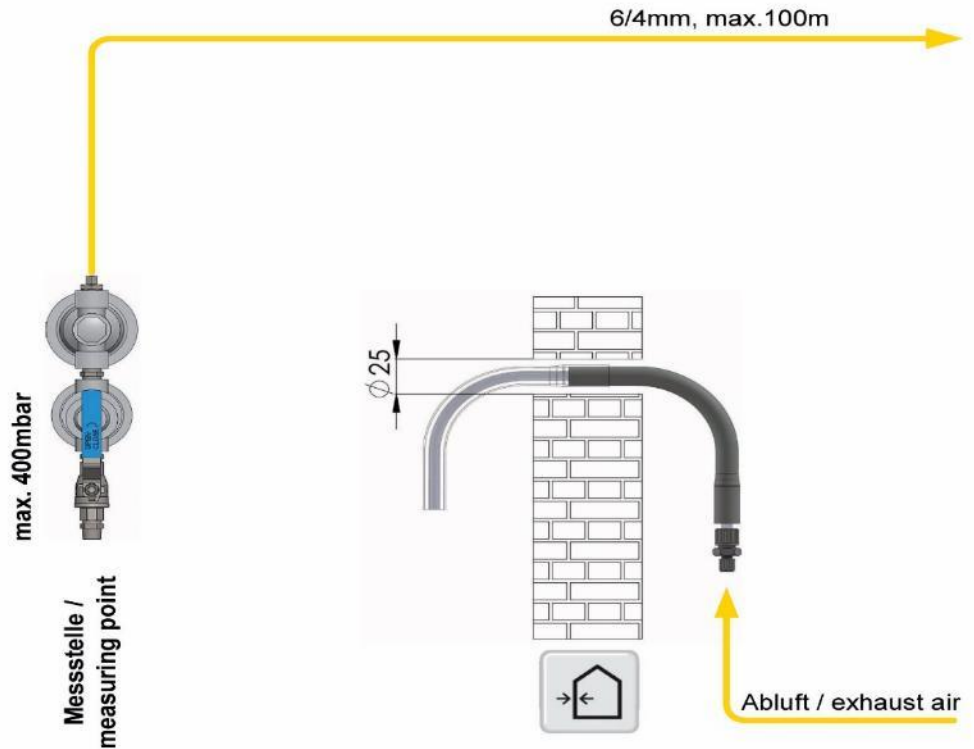
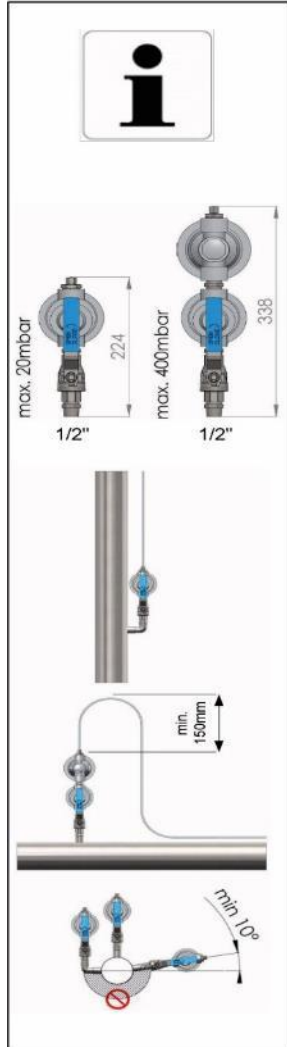
5°C - 35°C



# AWIECO INSTALLATION OVERVIEW



- 2 -

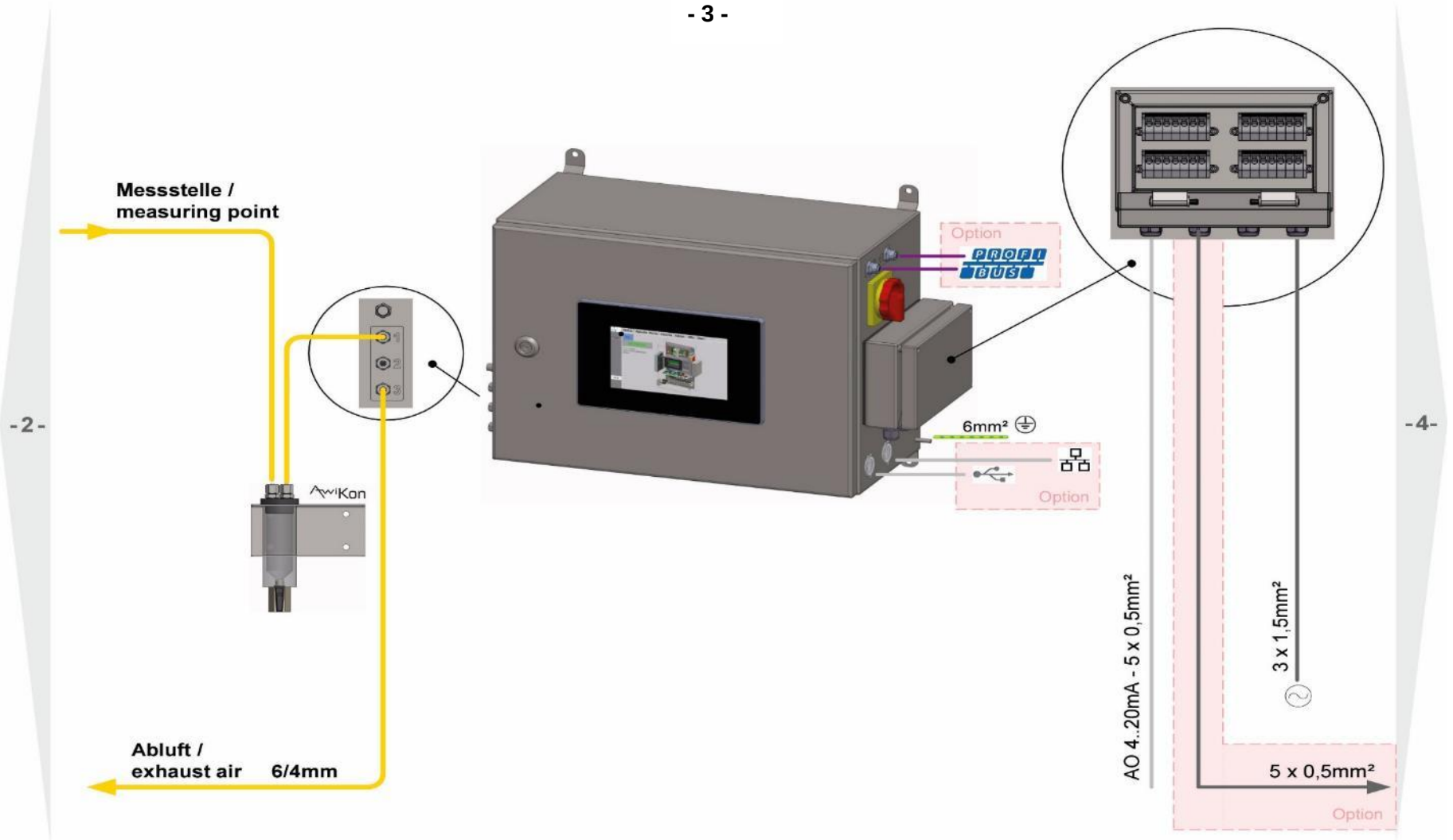


- 3 -

# AWIECO INSTALLATION OVERVIEW



- 3 -

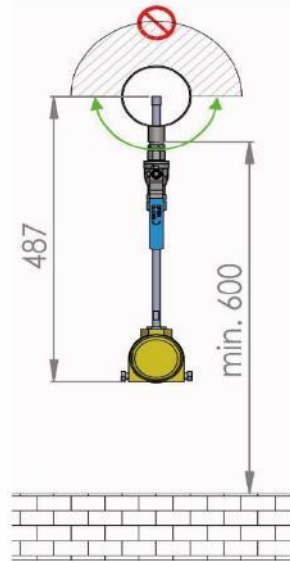
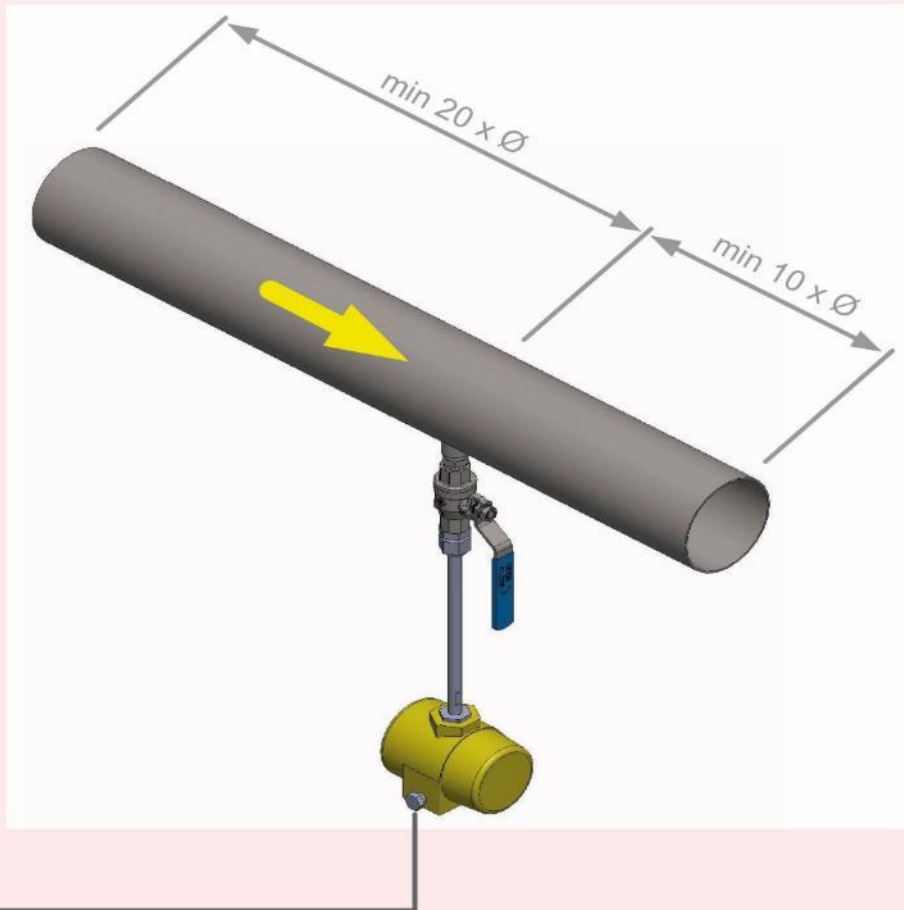


# AWIECO INSTALLATION OVERVIEW



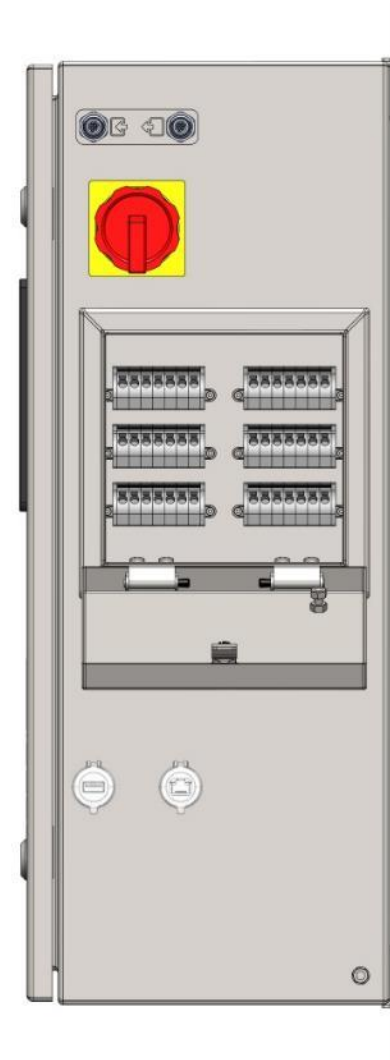
Zurück

- 4 -

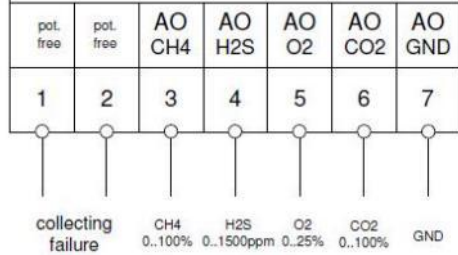


Option

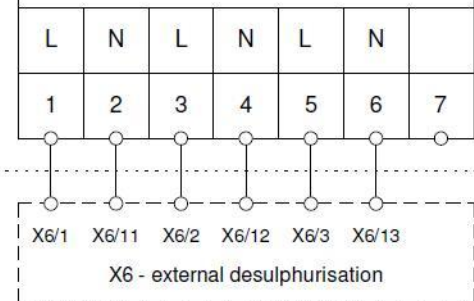




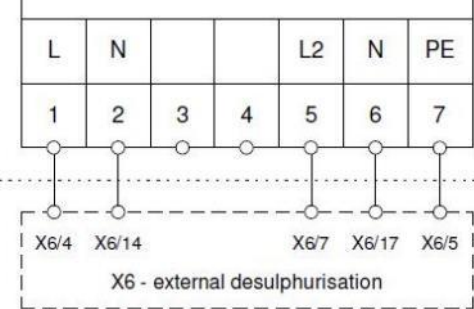
**X13**

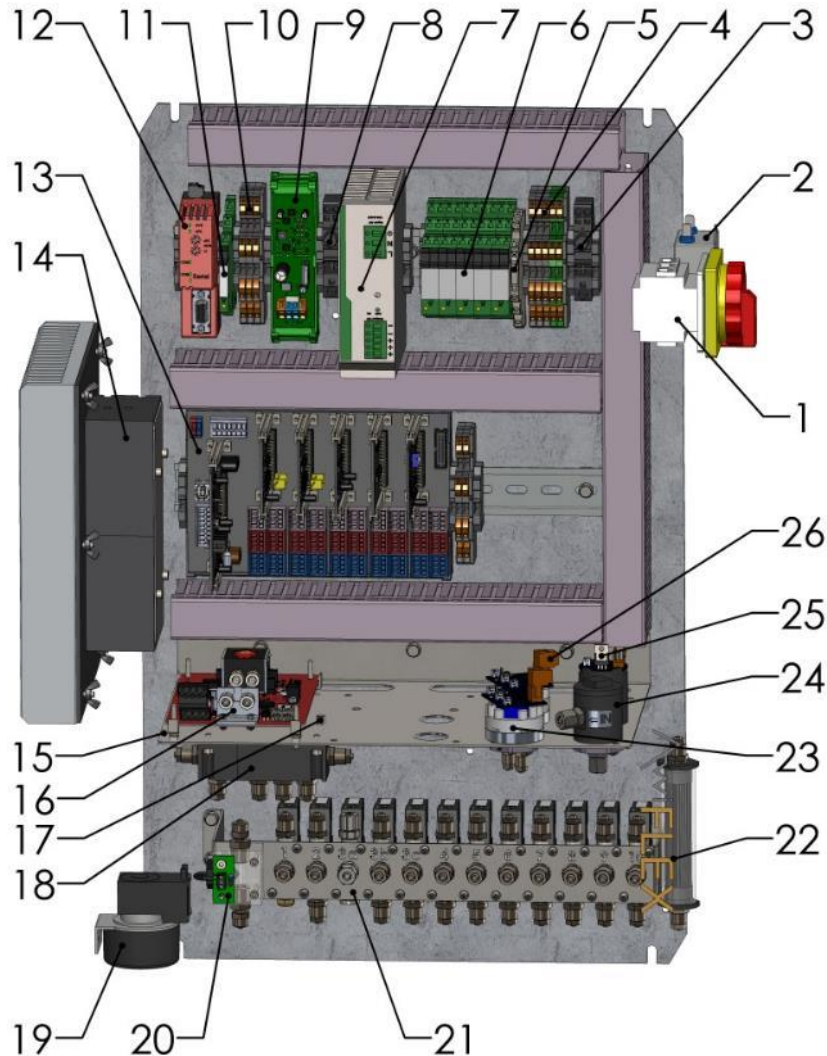


**X15**



**X16**



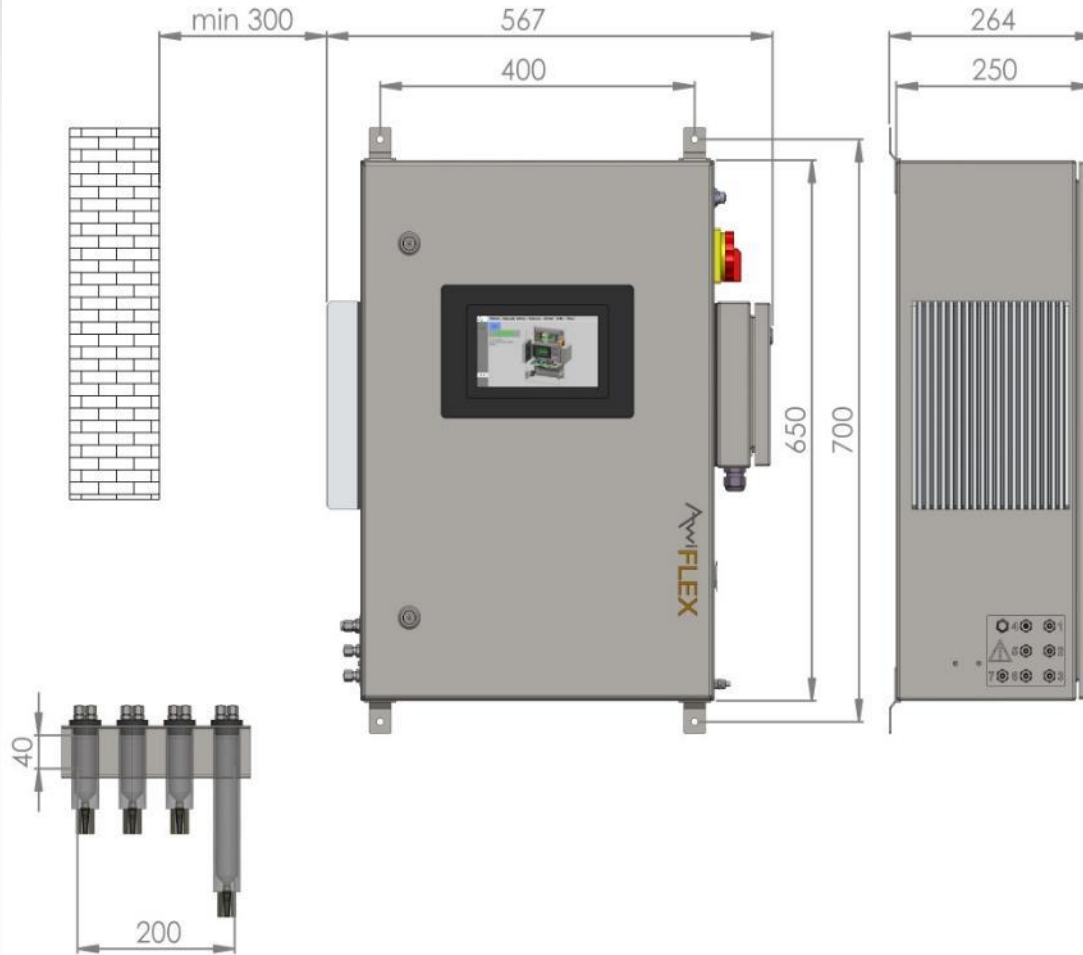


- 1 Main switch
- 2 Line filter
- 3 Fuse terminal 100 – 240 VAC
- 4 Terminal 100 – 240 VAC
- 5 Relay motor protection feedback
- 6 Relais AwiDESULF
- 7 Power supply unit
- 8 Fuse holder 24 VDC
- 9 AwiProtect
- 10 Terminal 24 VDC
- 11 Relays collective error
- 12 Profibus-module
- 13 AwiCORE (PLC-module)
- 14 Sample gas cooler AwiCool
- 15 Mounting bracket sensores
- 16 Multi gas sensor InfraFRED
- 17 Temperature sensor
- 18 AwiConnect inkl. pressure sensor
- 19 Membrane pump
- 20 Water sensor AwiH2O
- 21 Valves
- 22 Hydrogen sulfur filter
- 23 Hydrogen sensor
- 24 Filter AwiClean
- 25 Oxygen sensor
- 26 Hydrogen sulfur sensor

# AWIFLEX INSTALLATION OVERVIEW



## INSTALLATIONSÜBERSICHT / INSTALLATION OVERVIEW AWIFLEX COOL+ Information Installation



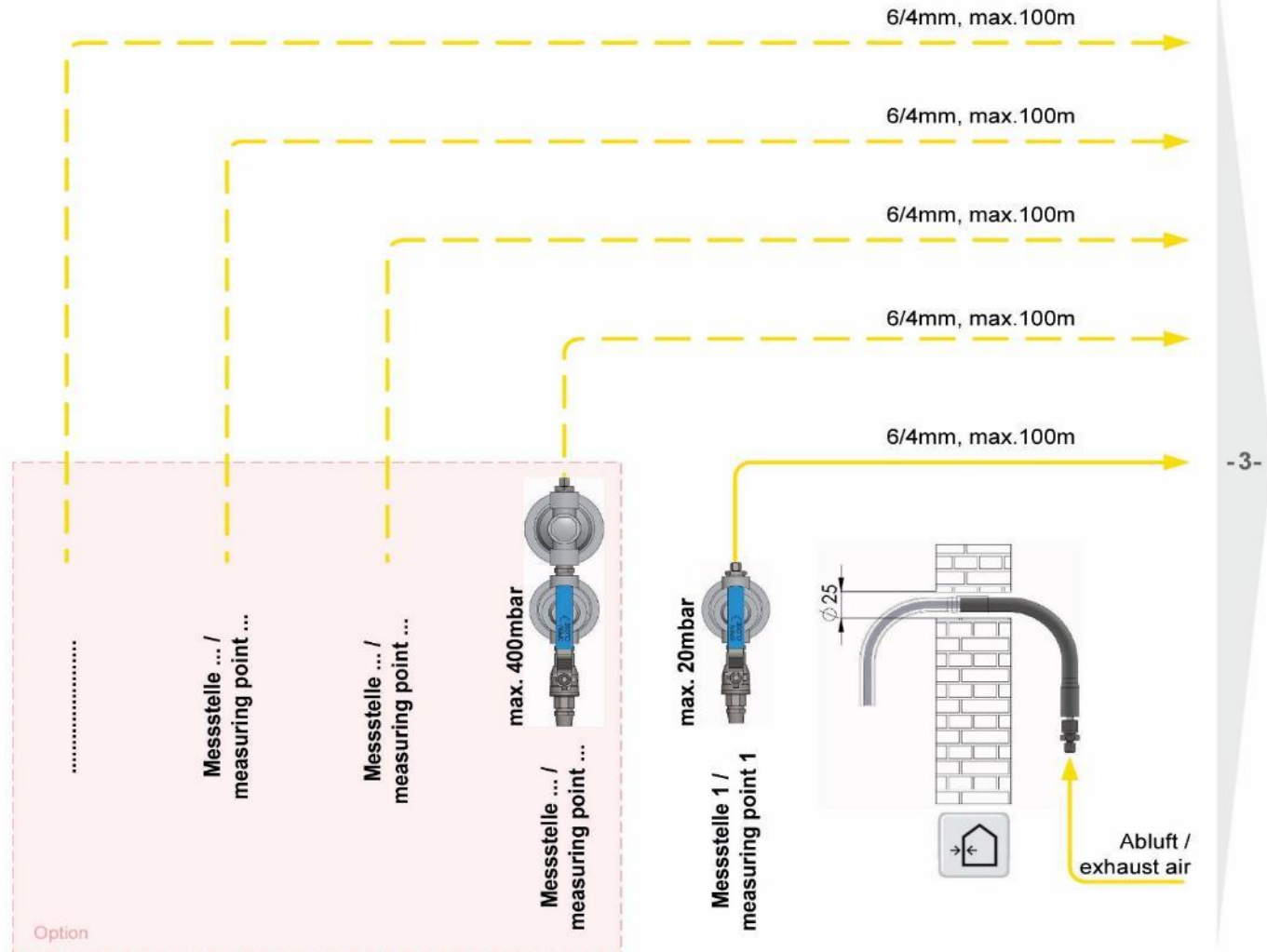
5°C - 35°C



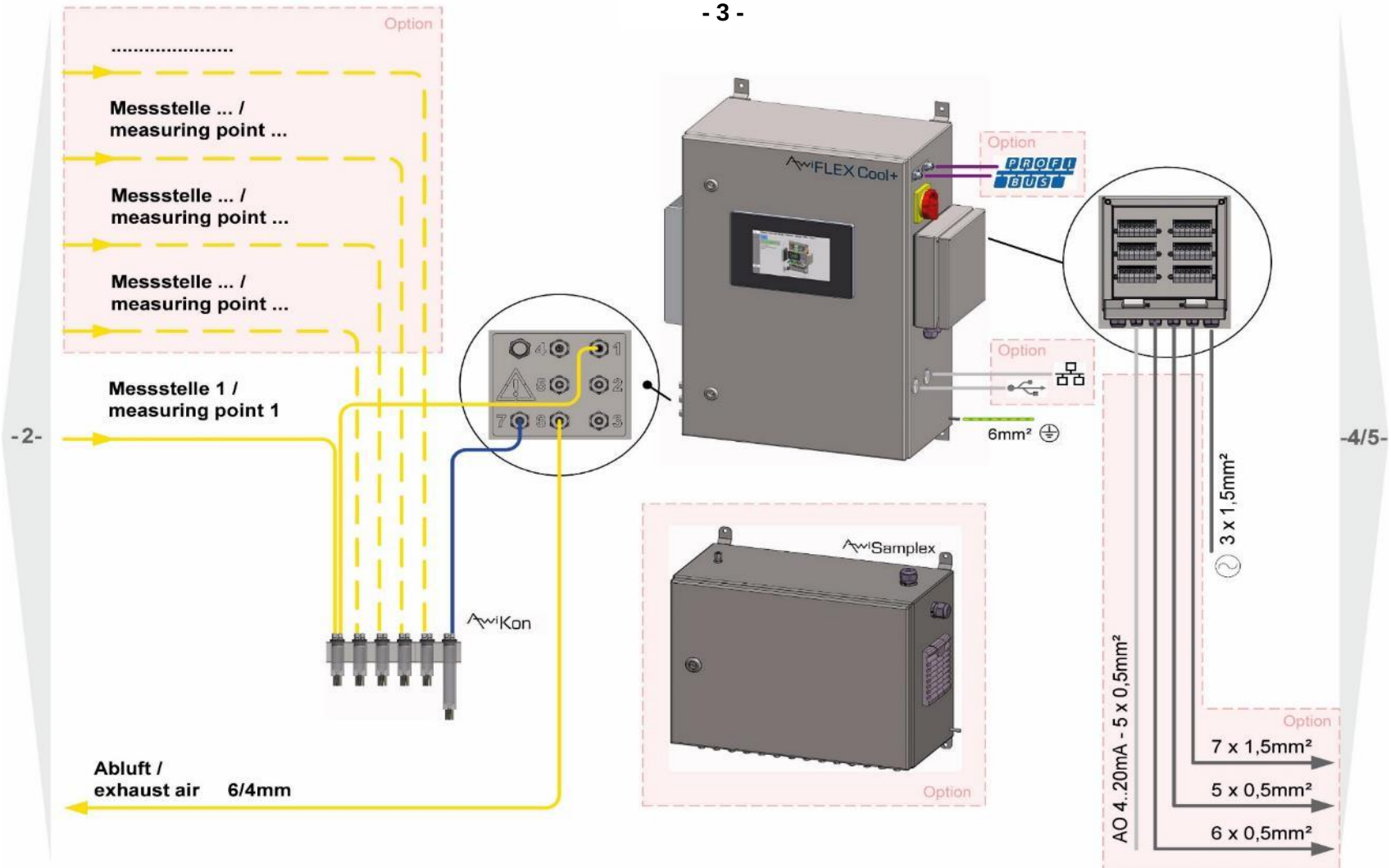
# AWIFLEX INSTALLATION OVERVIEW



- 2 -



# AWIFLEX INSTALLATION OVERVIEW

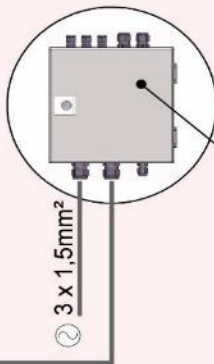
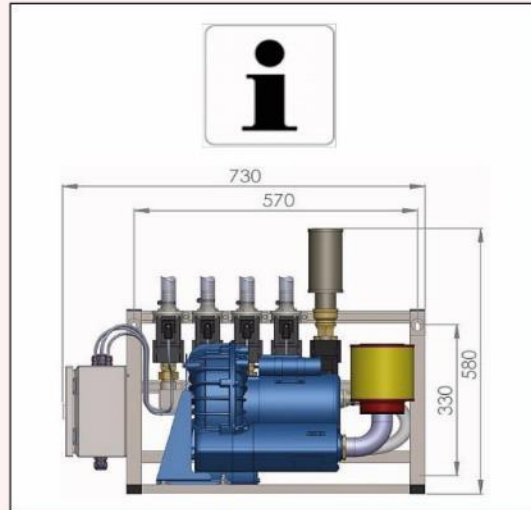




# AWIFLEX INSTALLATION OVERVIEW

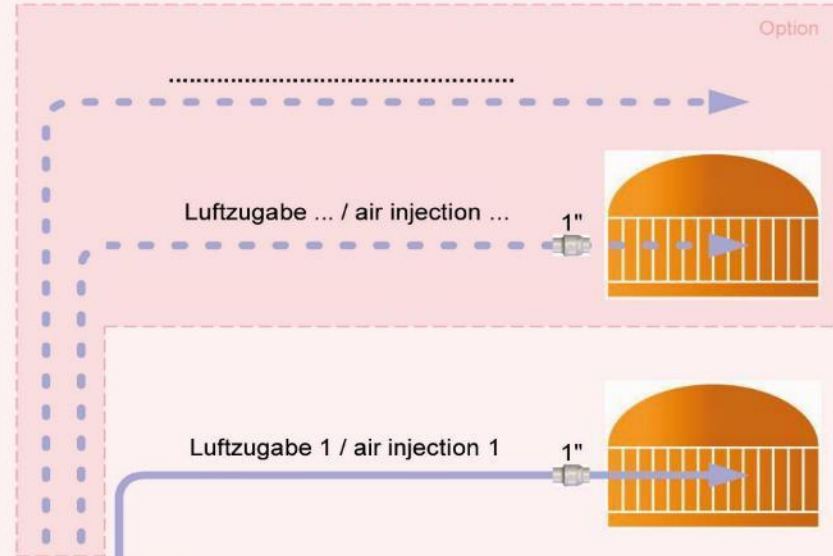
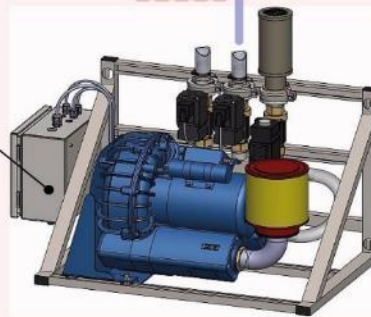
- 4 -

Awite DESULF



7 x 1,5mm²

3 x 1,5mm²

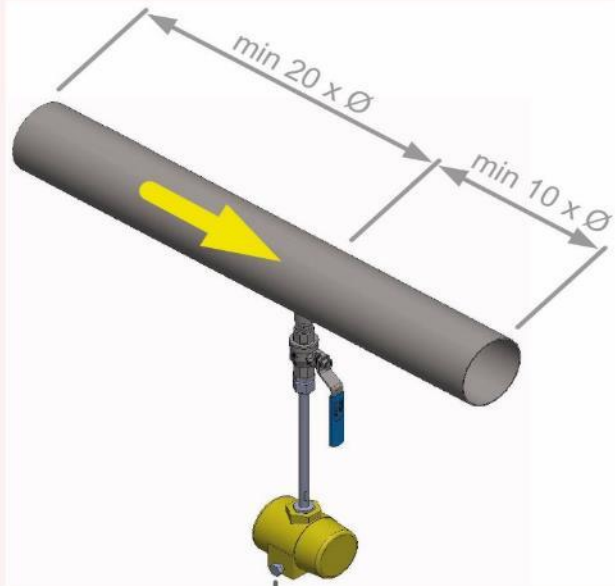


Option

# AWIFLEX INSTALLATION OVERVIEW



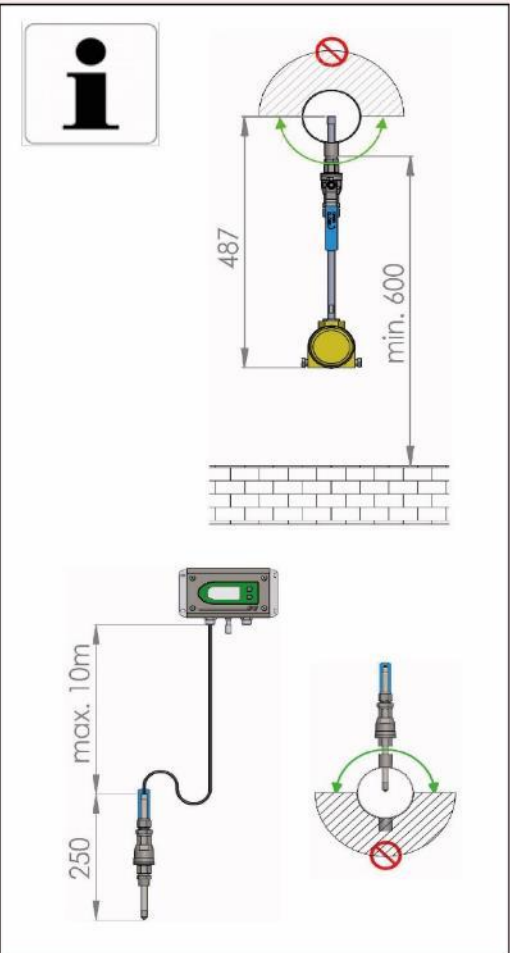
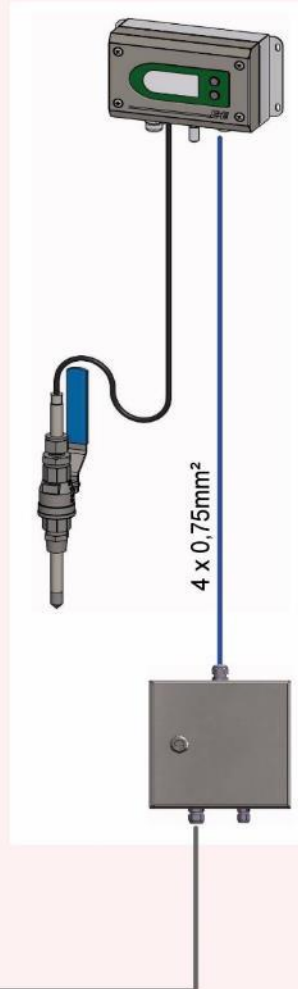
4



5 x 0,5mm<sup>2</sup>

6 x 0,5mm<sup>2</sup>

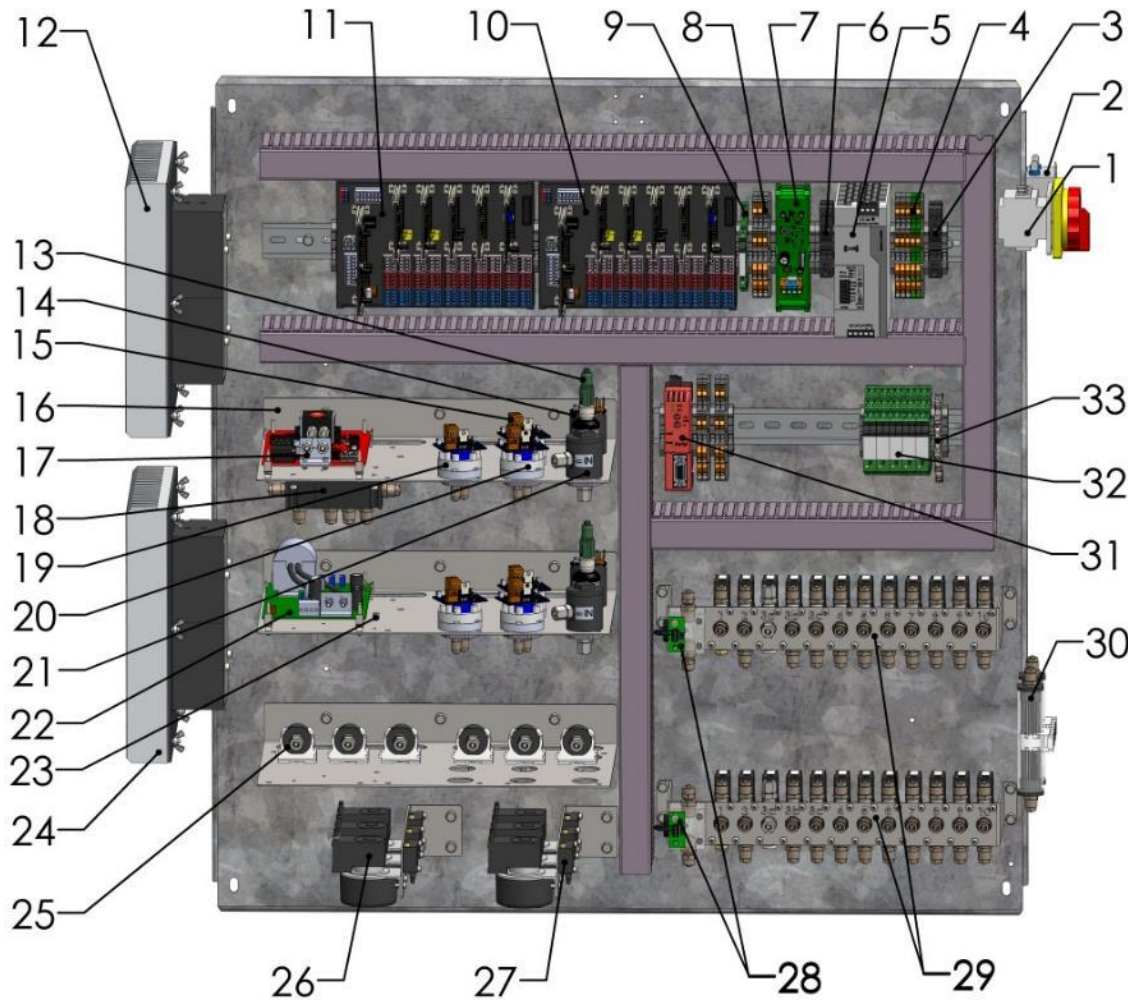
- 5 -



Option

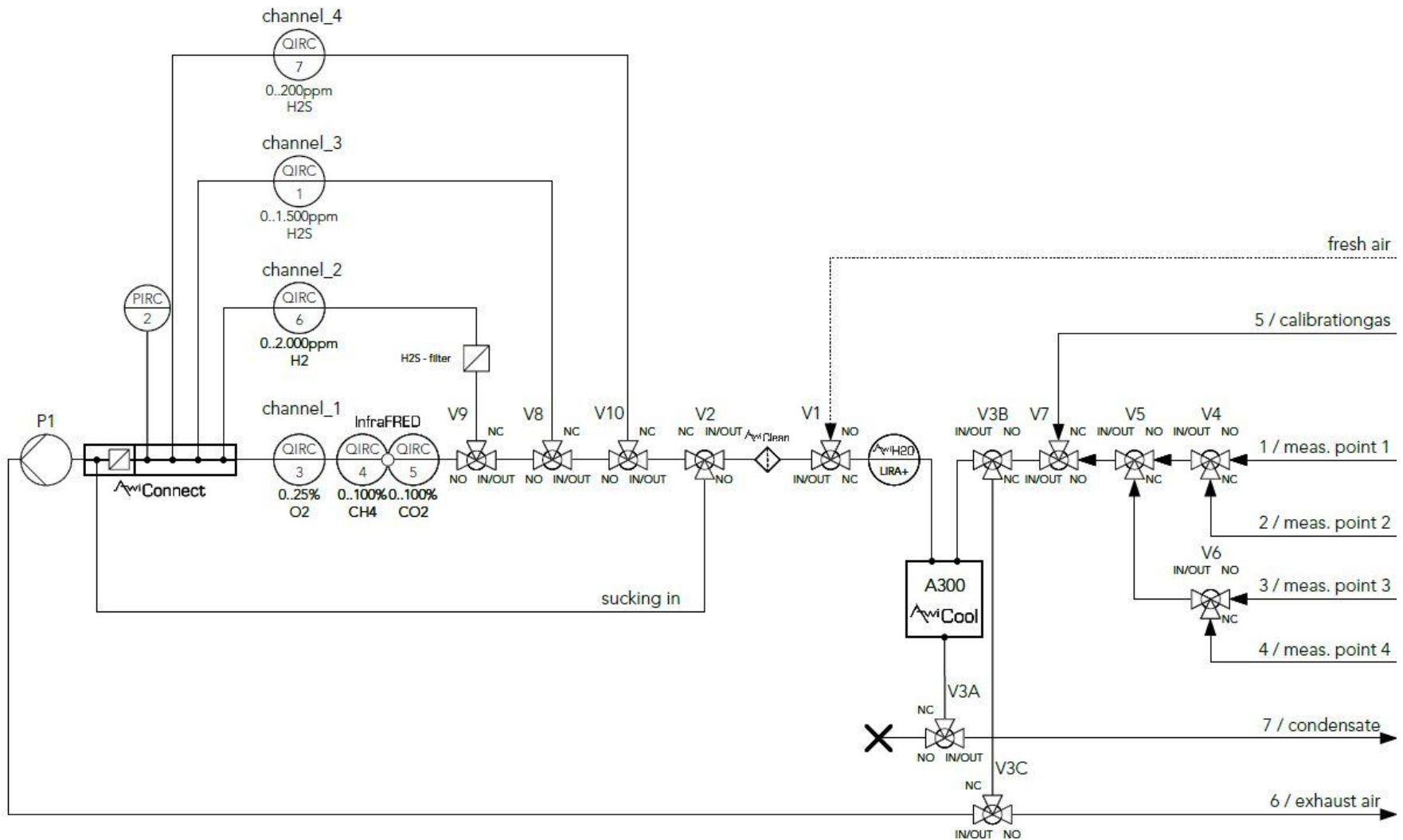




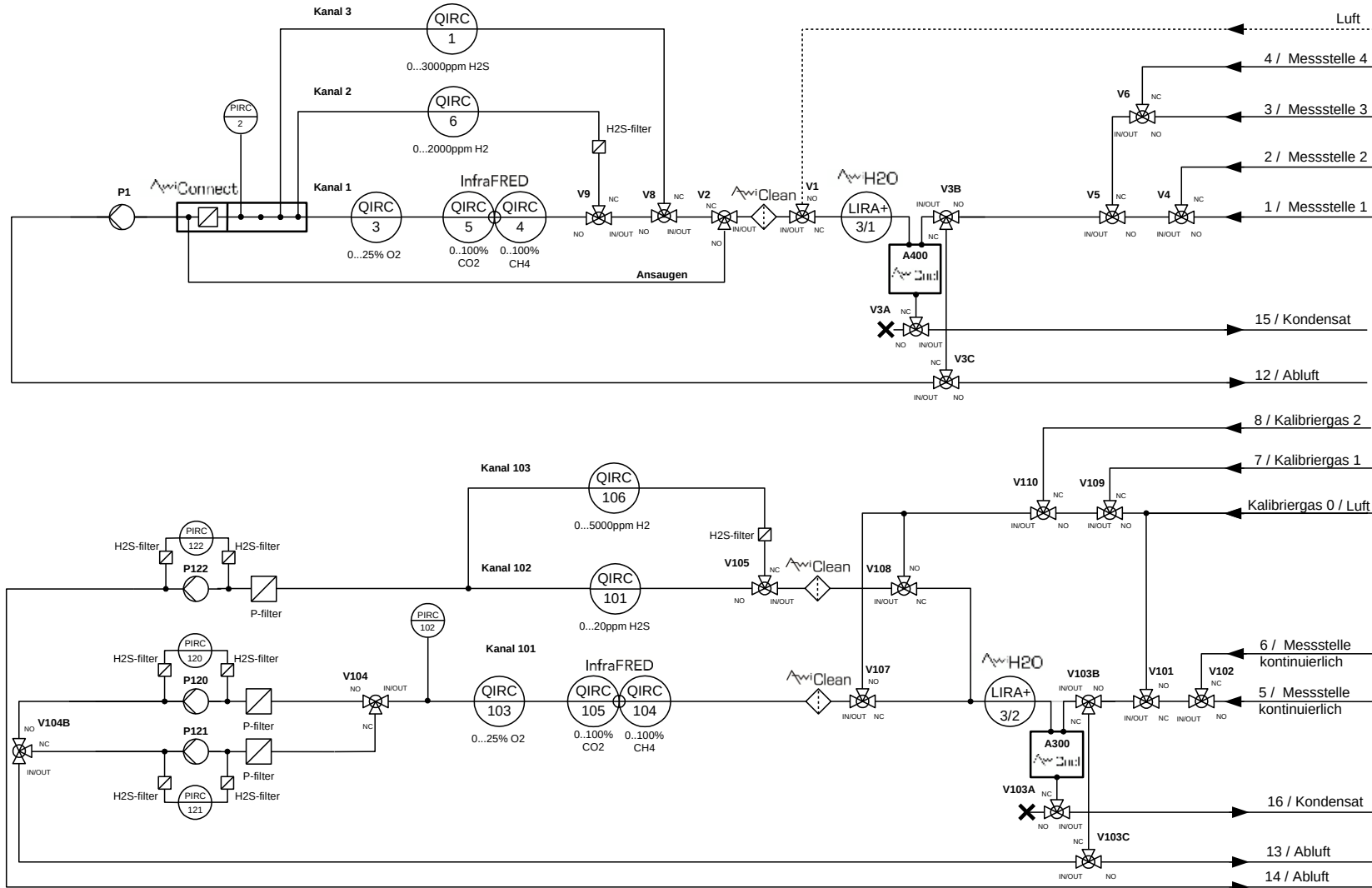


- 1 Main switch
- 2 Line filter
- 3 Fuse terminal 100 – 240 VAC
- 4 Terminal 100 – 240 VAC
- 5 Power supply unit
- 6 Fuse terminal 24 VDC
- 7 AwiProtect
- 8 Terminal 24 VDC
- 9 Relay collective error
- 10 AwiCORE 1 (PLC-Modul)
- 11 AwiCORE 2 (PLC-Modul)
- 12 Measuring gas cooler AwiCool
- 13 Absolute pressure sensor
- 14 Oxygen sensor
- 15 Electrochemical sensor
- 16 Assembly bracket sensor
- 17 Multigas sensor InfraFRED
- 18 AwiConnect incl.. pressure sensor
- 19 Electrochemical sensor
- 20 Electrochemical Sensor
- 21 Filter AwiClean
- 22 Thermal conductivity sensor
- 23 Temperature sensor
- 24 Samplegas cooler 2 AwiCool
- 25 Pressure filter
- 26 Membrane pump
- 27 Relative pressure sensor
- 28 Wassersensor
- 29 Valves
- 30 Hydrogen sulfide
- 31 Profibus-Module
- 32 Relay AwiDESULF
- 33 Relay motor protection feedback

# DISCONTINUOUS MEASUREMENT



# CONTINUOUS MEASUREMENT





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TEL. +49 (0)8761 / 72162-0

THANK YOU!

