



ADOS[®]
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INSTRUMENTATION AND CONTROL

PRODUCTION PROGRAM

measuring instruments for monitoring operational performance

■ Gas Analysis ■ Gas Warning ■ Environmental Protection



since 1997
DIN EN ISO 9001
ID: 01 100 71011



Company



1900

Formation of the ADOS Feuerungstechnische Gesellschaft GmbH in Aachen as the first factory worldwide to be established for chemical gas analysis on the basis of the Patent of Max Arndt for automatic tests on flue gases. The company was formed by Aachener Industrialists, all with equal shares.

1926

Acceptance of the company shares by the banker Leo Ruetgers as manager and Mrs. Elisabeth Lang née Houben.

1945

After the complete destruction in the Second World War, the manager Leo Ruetgers took over all the company's shares. He commenced with the rebuilding and once more started the production after he was granted approval by the authority of the British occupying forces.

1950

The company name was changed to ADOS GmbH. The program was extended to include the heat technology sector with volumetric measurement equipment (gas, vapour, water) and heat quantity measurement equipment for boiler house control.

1958

Grad. Eng. Herbert Ruetgers started in the company.

1973

Gas analysis was changed from wet-chemical to electric gas test equipment. The company and management was taken over by Grad. Eng. Herbert Ruetgers.

1990

Grad. Eng. Michael Ruetgers started in the company.

1997

Grad. Eng. Michael Ruetgers was invited to join the management as a junior partner.

2000

The company celebrated its Centenary Jubilee.

2005

Extension of the production possibilities by using new gas transmitters.

2012

First ATEX and SIL 1 gastransmitter GTR 210 EX is certified by DEKRA.

2015

GTR 210 MED is certified for marine applications.

2016

First ATEX and SIL 1 central unit FlexADOS 914/LON is certified by TUEV (Technical Control Board).

2017

Entry into fieldbus technology.

2020

DNV-GL-Certification of GTR 210 and FlexADOS 914.

Grad. Eng. Michael Ruetgers becomes sole managing Director.

2023

By implementing a photovoltaic power system on the flat roof of the production buildings the company produces its own electricity.



A test instrument hanging in an universal joint (to compensate the strong wave motion on board of a ship), when measuring carbon dioxide.



Triple test instrument (Triplex) for monitoring the CO, H₂ and CO₂ content of the ambient air. Used in the chemical industry.



The first automatic flue gas monitor "ADOS" from 1900. Driven by updraught in the chimney, the unit takes a sample of flue gas 10-times per hour, automatically analyses the sample and records the content of carbon dioxide. This forms a measure for the most economic use of fuel by the personnel responsible (boilermen). The standard is around 15% carbon dioxide content in the furnace gases.



In 1898, Max Arndt was awarded the "Elliot Cresson" gold medal in recognition of his patent "Econometer" automatic selfacting flue tester). The medal was awarded by the "Franklin Institute of the State of Pennsylvania, USA".





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Scope of Services and Solutions



- Consultation and Technical Planning
 - design and development of innovative components and systems in measuring and control engineering
 - Installation and Commissioning
 - planning the start-up and initiation phases
 - system control and adjustment
 - instruction and training
 - documentation
 - Technical Services
 - repairs
 - single inspections
 - maintenance and calibration
 - fault remedies
 - system components and spare parts service
 - system analysis
 - trans-european service – supplemented by our worldwide network of agencies abroad
 - coverage of various price and quality levels
 - all queries are immediately processed
-
- stationary gas measurement systems
 - highly-sensitive sensors measure a vast number of dangerous substances, even in very small concentrations and can thus give warnings of potential dangers
 - sophisticated equipment for special requirements as well as universal applications
 - extensive production program – “low budget” or “high end equipment”
 - system components for completion of a gas warning system
 - solutions for sampled gas conditioning and extraction





Physical Gas Analysis



Heat Reaction (VQ)

Measurement principle: Measuring the combustion heat at a fixed catalyst
Measuring ranges: from ppm to Vol% ranges
Measuring components: CH₄, NH₃, C₆H₆, CnHm and/or all combustible gases
Types of equipment: KM 2000 CnHm EM, GTR 210, GTR 196, LCTR 903, LCTR 404 LON®

Chemisorption at semiconductors (TGS)

Measurement principle: When combustible or reducing gases are absorbed by the surface of the sensor, the concentration of the test gas is determined by the change in conductivity.
Measuring ranges: ppm ranges up to 100% LEL
Measuring components: CH₄, LPG, H₂ and many others
Types of equipment: GTR 196, LCTR 903, LCTR 404 LON®

Thermal Conductivity (GOW)

Measurement principle: Measuring the different thermal conductivity between test gas and reference gas
Measuring ranges: 0-2 Vol% ... 0-100 Vol%
Measuring components: CO₂, H₂, He and many others
Types of equipment: GTR 210

Electrochemical Reaction (TOX)

Measurement principle: Measuring the electron flow produced by chemical reaction
Measuring ranges: from ppm to Vol% ranges
Measuring components: CO, O₂, H₂S, SO₂, Cl₂, HCl, NH₃, NO, NO₂ and many others
Types of equipment: TOX 592, TOX 914 LON®, GTR 210, GTR 196

Infrared Analysis (IR)

Measurement principle: Non-dispersive infrared analysis
Measuring ranges: from 0-2.000 ppm to 0-100% LEL
Measuring components: CO₂, LPG, CH₄, CnHm, refrigerant and many others
Types of equipment: GTR 210, GTR 196, LCTR 903

Photoionisation: (PID)

Measurement principle: ultra-violet measurement
Measuring ranges: 0-200 ppm...0-2000 ppm
Measuring components: e.g. C₇H₈, C₈H₁₀, CHCl₃, PH₃ and others
Types of equipment: GTR 210, GTR 196

Gas Measurement and Gas Warning Sensors

Measurement principle: Chemisorption at semiconductors, Heat reaction, Thermal conductivity, Electrochemical reaction, Infrared analysis, ultra-violet measurement
Measuring ranges: *Chemisorption at semiconductors:* ppm ranges to 100% LEL
Heat reaction: 0-5 Vol% to 0-100% LEL
Thermal conductivity: from 0-2 Vol% to 0-100 Vol%
Electro-chemical reaction: from ppm ranges to Vol% ranges
Infrared analysis: from 0-2.000 ppm to 0-100% LEL
Photoionisation: 0-200 ppm...0-2000 ppm
Measuring components: O₂, H₂, CO₂, CO, CH₄, hydrogen chloride, helium, neon, propane, toluene, xylene and many others

TYPES OF EQUIPMENT:

GW 399: multi-channel gas detector system comprising central control units and remote sensors with 4-20 mA current interface (e.g. GTR 210, GTR 196, TOX 592, LCTR 903) functional testing for the explosion protection parts GW 399/GTR 196 Ex

MWS 906: multi-channel gas warning system for 16 two-line or three-line sensors and max. 48 relays for alarms for the activation of further warning and control units (e.g. warning banners and signal horns)

MWS 903: Multi-channel gas warning unit for a total of 8 gas sensors and 12 floating change-over contacts (e.g. GTR 210, GTR 196, TOX 592, LCTR 903)

MWS 897: Multi-channel gas warning unit for a total of 6 gas sensors in 2-wire technology or 3 sensors in 3-wire technology and 3 floating change-over contacts (e.g. GTR 210, GTR 196, TOX 592, LCTR 903)

FlexADOS 914: Multi-Channel Gas Detector System for 12 two- or three-wire detectors and max. 17 floating contacts

FlexADOS 914 LON®: Test, Control and Warning Unit for the techniques of gas-sensorics; Connection of up to 60 LON-Bus sensors is possible, and two monitoring areas (five alarm thresholds per sensor, independently adjustable). Expandable for up to 6 monitoring areas.

FlexADOS 914 CP: multi-channel gas warning system for 12 two-line or three-line sensors up to 2 alarm levels, each with 6 relays (five alarm thresholds for each sensor, independently adjustable). Expandable for up to 6 monitoring areas

FlexADOS 914 MED: Multi-channel gas detection system for 12 two- or three-wire sensors and max. 17 potential-free contacts; Compatible with various fieldbus interfaces. It is designed for the high requirements in maritime use

GTR 210 Comfort: Single-Channel Gas Warning System with integrated gas sensor.



Gas Analysis

Bio Gas Analysis

Multi Channel Gas Analyser for Fermentation

Measurement principle: Electrochemical reaction, infrared analysis

Measuring ranges: CO₂: 0-50 Vol%;
CH₄: 0-100 Vol%;
O₂: 0-5 Vol %... 0-25 Vol %
H₂: 0-2 Vol%;
H₂S: 0-50 ppm ... 0-9.999 ppm;
further ranges on request

Measuring components: CH₄, CO₂, O₂ (optionally continuous);
H₂S, H₂ (only discontinuous)
Monitoring of several measuring points possible

Types of equipment: Biogas 401 (modular design), Biogas 905 (compact design)

Flue Gas Analysis

Measurement principle: Electrochemical reaction, thermal conductivity

Measuring ranges: CO: 0-100 ppm; CO₂: 0-20 Vol %; O₂: 0-25 Vol %

Measuring components: CO, CO₂, O₂

Types of equipment: Flue Gas Analyser RG 399

Gas warning systems for ships and maritime industry

Measurement principle: catalytic combustion, Infrared absorbtion, electrochemical reaction

Measuring ranges: 0-100% LEL alkanes [methane...hexane], hydrogen, ethylene,
0-25 Vol % O₂, 0-5.000 ppm CO₂, 0-50 ppm H₂S,
0-2.000 ppm R134a, multiple refrigerants: 0-2.000 ppm

Measuring components: Alkanes [Methane...Hexane], hydrogen, ethylene,
O₂, CO₂, H₂S, R134a, multiple refrigerants

Device Type: GTR 210 MED, FlexADOS 914 MED

Accessories for Gas Analysis



Alarm horns



Warning banners



Alarm horn
Ex-version



Rotating mirror lamp
(also available as
Ex-version)



Warning flasher
(also available as
Ex-version)



Signal tower



Room probes



Mains Stand-by
supply unit



Test gas bottle



Pressure reducer



Special equipment for specific tasks and measurement problems on demand.

pH Measurement

pH-Measured Value Transducer: Flow-through fitting, electrode, impedance transformer, coaxial electrode connection cable, buffer solutions. Measuring transducer: ADOS GTR 210 pH or GTR 196 pH
Evaluation unit: e.g. MWS 906 for 8 pH sensors and 8 gas sensors

Accessories: Balance lines, thimbles, stop flanges, protective sleeves, welding collars,
reference junction thermostats, compensating terminals

Ion-selective measurement

ISE-measuring element: Flange for horizontal pipeline construction with DN50, PN16;
Built-in flange for open and pressureless containers

Measuring transducer: ISE NH₃

Evaluation unit: FlexADOS 914, MWS 903, MWS 906

Software and Ancillaries

Software: Fieldbus extension module for FlexADOS 914 series compatible with:
LONWorks, Profibus DP, Modbus RTU, Modbus TCP

Buffer amplifier: 0-20 mA → 0-20 mA
others on request



VENTILATION ENGINEERING

Fields of Application: Underground car parks in residential & office buildings, road traffic tunnels (CO, NOX), monitoring the CO₂ content in conference rooms, monitoring fine dust filter systems for any breakthrough

Customers: Cactus Howald (Luxembourg), Parc du Canal (Luxembourg), Amazon, Atlantic Hotel Münster, Celler Parkbetriebe GmbH, Tiefgarage Roller Offenbach



BREWERIES + CHAMPAGNE PRODUCERS

Fields of Application: CO₂- and O₂ measurements

Customers: Bitburger (Germany), Brau-Union (Austria), Cölner Hofbräu P. Josef Früh KG (Germany), Hasseröder Brauerei (Germany), Pott's Brauerei Oelde (Germany)



MOTOR VEHICLE INDUSTRY

Fields of Application: Paint shops – monitoring organic solvents (toluene), motor and brake test beds (CO, NOX, SO₂, CnHm, H₂), emission measurements

Customers: Audi (Germany), BMW (Germany), FEV Motorentechnik (Germany, China), Ford (Germany, USA), Haden (Great Britain), Opel (Germany), Toyota (France), Visteon (France), Volkswagen (Germany)



AGRICULTURE

Fields of Application: Gas analyzers for biogas

Customers: C.E.A. (Italy), Shandong Minghe Poultry Biogas Plant (China), Biomasse-Heizkraftwerk Hünenberg (Switzerland), Hühnerhof Terhorst (Germany), Biogas Technology BV (Netherlands), Rainborrow Farm Poundbury (GB), Wyke Farms (GB), Rhön Energiesysteme (Germany), TS-Umweltanlagenbau (Germany)



WORKPLACE PRODUCTION

Fields of Application: MWC-monitoring – controlling the workplace concentration limits; explosion protection

Customers: Hutchinson (Germany, France), Mapa in Liancourt (France), Procter & Gamble (world-wide), Volkswagenwerk Emden (Germany)



HYDROGEN

Fields of Application: Electrolysis, leakage detection

Customers: Teledyne Energy Systems (USA), Scribner (USA), Hydrogenics Corporation / Cummins Power Systems (Canada), McPhy Energy (Italy), Air Liquide Electronics (Germany), Ecoclean GmbH (Germany)



ACTIVATED CARBON FILTER

Fields of Application: Monitoring the breakthrough of solvents (Process control + Emission monitoring)

Customers: Beiersdorf (Germany), Prinovis (Germany, Great Britain), Nitrochemie AG (Switzerland)



LIQUID GAS STORES

Fields of Application: LPG (butane + propane)

Customers: Linde (Austria), Praxair (Spain)



SEWAGE PLANTS

Fields of Application: H_2S , CO_2 , CH_4 , O_2 , H_2

Customers: Minden (Germany), Heidelberg (Germany)



COLD-STORAGE DEPOTS

Fields of Application: Leakage monitoring of NH_3 , CO_2 and Freon

Customers: Amberger Kühlechnik (Germany), GfKK (Germany), Johnson Controls (Germany)



LABORATORIES

Fields of Application: foodstuffs, pharmacy, mineral oil

Customers: RWTH-Aachen (Germany), Grüenthal (Germany), Bode Chemie (Germany), Vetter Pharma (Germany), Lindt & Sprüngli (Germany), Uni Mainz (Germany), Uni Münster (Germany)



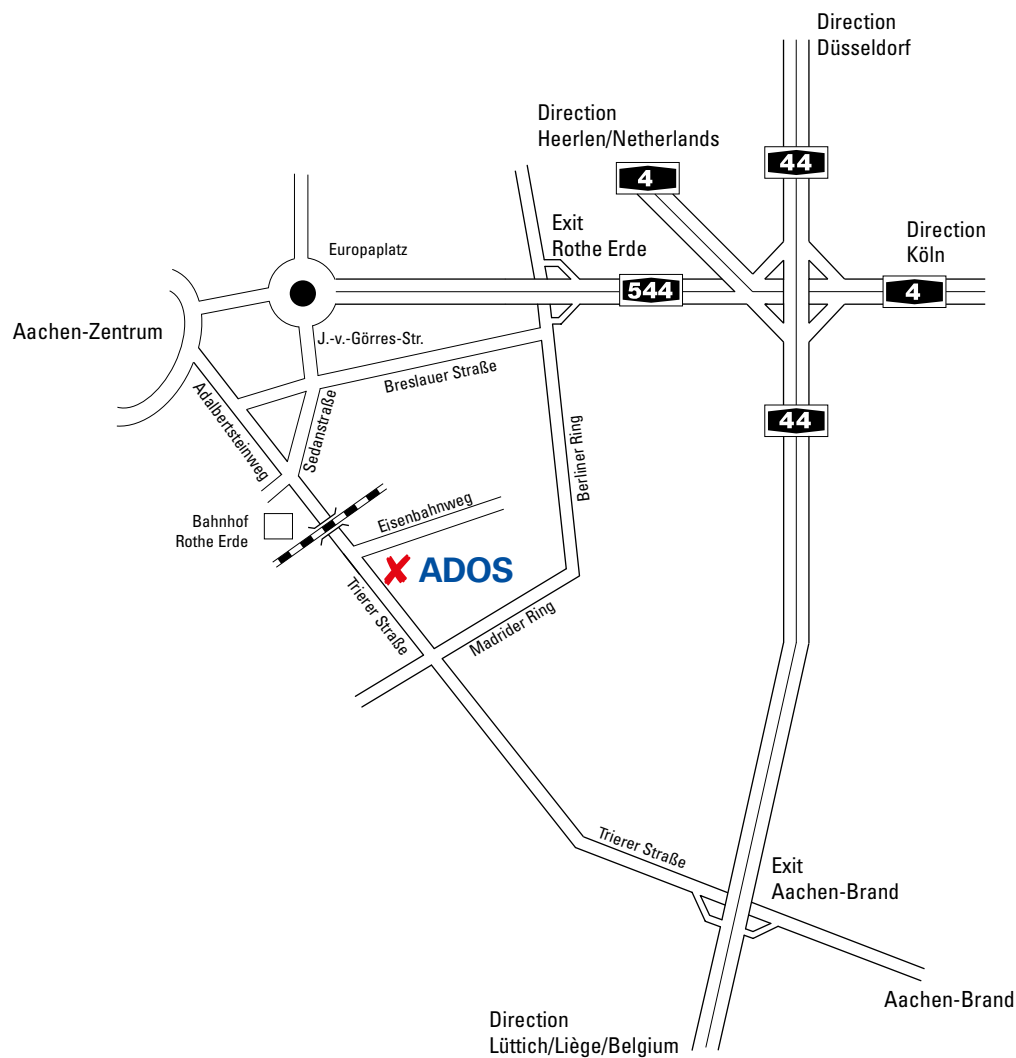
MARINE

Fields of Application: Ships with LNG, LPG and LFL propulsion systems. LNG, CNG, oil and chemical tankers, Cruise ships

Customers: Fassmer-Werft (Germany), eCap Marine GmbH (Germany)



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