



ADOS[®]
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INSTRUMENTATION AND CONTROL

PRODUCTION PROGRAM

measuring instruments for monitoring operational performance

■ Gas Analysis ■ Gas Warning ■ Environmental Protection

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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.



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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Physical Gas Analysis

Heat Reaction

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

Chemisorption at semiconductors

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 210, GTR 196, GWA 2000, LCTR 903, LCTR 404 LON[®]

Thermal Conductivity

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, GTR 196, GWA 2000

Electrochemical Reaction

Measurement principle: Measuring the electron flow produced by chemical reaction
Measuring ranges: from a few ppm up to Vol% ranges
Measuring components: CO, O₂, H₂S, SO₂, Cl₂, HCl, NH₃, NO, NO₂ and many others
Types of equipment: TOX 592, GTR 210, GTR 196, GWA 2000

Infrared Analysis

Measurement principle: Non-dispersive infrared analysis
Measuring ranges: from 0-3.000 ppm to 0-100 Vol%
Measuring components: CO₂, CO, LPG, CH₄, CnHm and many others
Types of equipment: ITR 498, ITR 504, GTR 210, GTR 196, LCTR 903

Gas Measurement and Gas Warning Sensors

Measurement principle: Chemisorption at semiconductors, Heat reaction, Thermal conductivity, Electrochemical reaction, Infrared analysis
Measuring ranges: *Chemisorption at semiconductors:* ppm ranges to 100 % LEL
Heat reaction: 0-5 Vol% to 0-100 Vol%
Thermal conductivity: from 0-2 Vol% to 0-100 Vol%
Electro-chemical reaction: from ppm ranges to Vol% ranges
Infrared analysis: from 0-3.000 ppm to 0-100 Vol%
Measuring components: O₂, H₂, CO₂, CO, CH₄, hydrogen chloride, helium, neon, propane, toluene, xylene and many others

TYPES OF EQUIPMENT:

Multitronik 592: modular constructed, universal measuring, control and warning unit for gas analysis, fully electronic versions or with gas intake, for sensors with 4-20 mA current interface or LON[®] interface (e.g. GTR 210, GTR 196, GWA 2000 Sensor, TOX 592, ITR 498, LCTR 903, LCTR 404 LON[®])

LON[®] Center 2000: compact measuring, control and warning unit for gas analysis, fully electronic version, for sensors with LON[®] interface (e.g. GTR 210, GTR 196, GWA 2000 Sensor, TOX 592, ITR 498, LCTR 404 LON[®])

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, GWA 2000 Sensor, TOX 592, ITR 498, 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 906 CP: multi-channel gas warning system for 16 two-line or three-line sensors up to 2 alarm levels, each with 6 relays (five alarm thresholds for each level, independently adjustable)

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, GWA 2000 Sensor, TOX 592, ITR 498, LCTR 903)

MWS 897: Multi-channel gas warning unit for a total of 6 gas sensors and 3 floating change-over contacts (e.g. GTR 210, GTR 196, GWA 2000 Sensor, TOX 592, ITR 498, LCTR 903)

GWA 2000: single-channel gas detector with integrated sensor, or available as a remote sensor version with display



Gas Analysis

Bio Gas Analysis

Multi Channel Gas Analyser for Fermentation

Measurement principle: Electrochemical reaction, infrared analysis, paramagnetic measurement

Measuring ranges: CO₂: 0-50 Vol%;
CH₄: 0-100 Vol%;
O₂: 0-21 Vol% (electrochemical);
O₂: 0-5 Vol% ... 0-25 Vol% (paramagnetic);
H₂: 0-2 Vol%; H₂S: 0-50 ppm ... 0-5.000 ppm;
further ranges on request

Measuring components: CH₄, CO₂, O₂ (optionally continuous);
H₂S, H₂ (only discontinuous)

Types of equipment: Biogas 401, Biogas 905

Infrared Gas Analysis System for Composting

Measurement principle: Non-dispersive infrared analysis

Measuring ranges: from 0-3.000 ppm to 0-100 Vol %

Measuring components: CO₂

Types of equipment: ITR 504

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

Hand-held Measuring Unit

Infrared hand-held unit

Measurement principle: Non-dispersive infrared analysis

Measuring ranges: 0-2 Vol% ... 0-100 Vol% CO₂; 0-25 Vol% O₂

Measuring components: CO₂, O₂

Types of equipment: ITR 498 Hand-held unit "Comfort" (measurement of CO₂ and O₂)
ITR 498 Hand-held unit "Economy" (measurement of CO₂)

Accessories for Gas Analysis

Signal horns (small & large versions), signal horns as ex-version, rotating mirror und warning lights, flasher warning banners in English, German or French (other languages by request), test gas bottle, pressure regulator, gas extraction pipe, installation parts, heated extraction pipe, pH-probe, space probes, gas samplers, filters, washers, peltier coolers, driers, manual change-over switches, automatic selectors for up to 24 measuring points, diaphragm pumps, diaphragm compressors, side-duct blowers, transducers for output: 0-(4)-20 mA, limit monitors, calibration gases, carrying cases, charger units, standby power supply unit, special accessories for particular tasks and measurement problems.

Details available on request. Complete ventilator-control cabinets for ventilation units.



Gas Analysis

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 for 8 pH sensors and 8 gas sensors: MWS 906 Sensor, compact
Accessories: Balance lines, thimbles, stop flanges, protective sleeves, welding collars, reference junction thermostats, compensating terminals

Recorders, Indicators, Counters, Software

Indicators:	Housing dimensions: 192 x 192 mm & 144 x 72 mm
Recorders:	Single-colour and six-colour dot recorders Single-colour, two-colour and three-colour line recorders
Counters:	Electric mass flow counters – Housing dimensions: 72 x 144 mm Input signal: 0-(4)-20 mA
Software:	data collection and visualisation with the software "Log & View" for MWS 903

Electrical Transducers and Ancillaries

Transducers
current → voltage
voltage → current
0-10V → 0-(4)-20 mA

Buffer amplifier
0-20 mA → 0-20 mA

others on request



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
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- stationary and portable 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





Fields of Application



VENTILATION ENGINEERING

Fields of Application: Underground car parks in housing estates and office blocks, road traffic tunnels (CO, NO_x), monitoring the CO₂ content in conference rooms, monitoring fine dust filter systems for any breakthrough

Customers: Climalux (Luxembourg), Elco (Luxembourg), Imtech (Germany), Koehl Facility S.A. (Luxembourg), Paul Wagner et Fils S.A. (Luxembourg), Reckinger Alfred S.A. (Luxembourg), Truss Haustechnik (Germany), Wolfferts (Germany), W.P.S. Luxembourg S.à.r.l. (Luxembourg), YIT (Germany)



BREWERIES + CHAMPAGNE PRODUCERS

Fields of Application: CO₂- and O₂ measurements

Customers: Almaza (Lebanon), Bitburger (Germany), Brau-Union (Austria), Henkell (Germany), Krombacher (Germany), Warsteiner (Germany)



MOTOR VEHICLE INDUSTRY

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

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



AGRICULTURE

Fields of Application: Measurement systems for biogas

Customers: Hofstetter France (France), Kanada West Coast Landfield (Canada), ONDEO Degrémont (France), Rhoen Energiesysteme (Germany), TS-Umweltanlagenbau (Germany), Sugar Refinery Tirlemont (Belgium)



WORKPLACE PRODUCTION

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

Customers: Elias Ghali & Sons (Syria), Hutchinson (Germany, France), Mapa in Liancourt (France), Procter & Gamble (world-wide)



ACTIVATED CARBON FILTER

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

Customers: Beiersdorf (Germany), Disun (Hongkong), Duerr (world-wide), E3-Killian Inc. (USA), Impremerie Quebecor (France, Canada), Norit (Netherlands), Prinovis (Germany, Great Britain), VA Tech Elin Inc. (USA)



LIQUID GAS STORES

Fields of Application: LPG (butane + propane)

Customers: Linde (Austria), Praxair (Spain)



SEWAGE PLANTS

Fields of Application: H₂S, CO₂, CH₄, O₂, H₂

Customers: Bassin de Rhodenbeek (Belgium)



COLD-STORAGE DEPOTS

Fields of Application: Leakage monitoring of NH₃, CO₂ and Freon

Customers: Amberger Kühltechnik (Germany), COOL-TEC S.A. (Luxembourg), GfKK (Germany), Grencobell (Belgium), Johnson Controls (Germany)