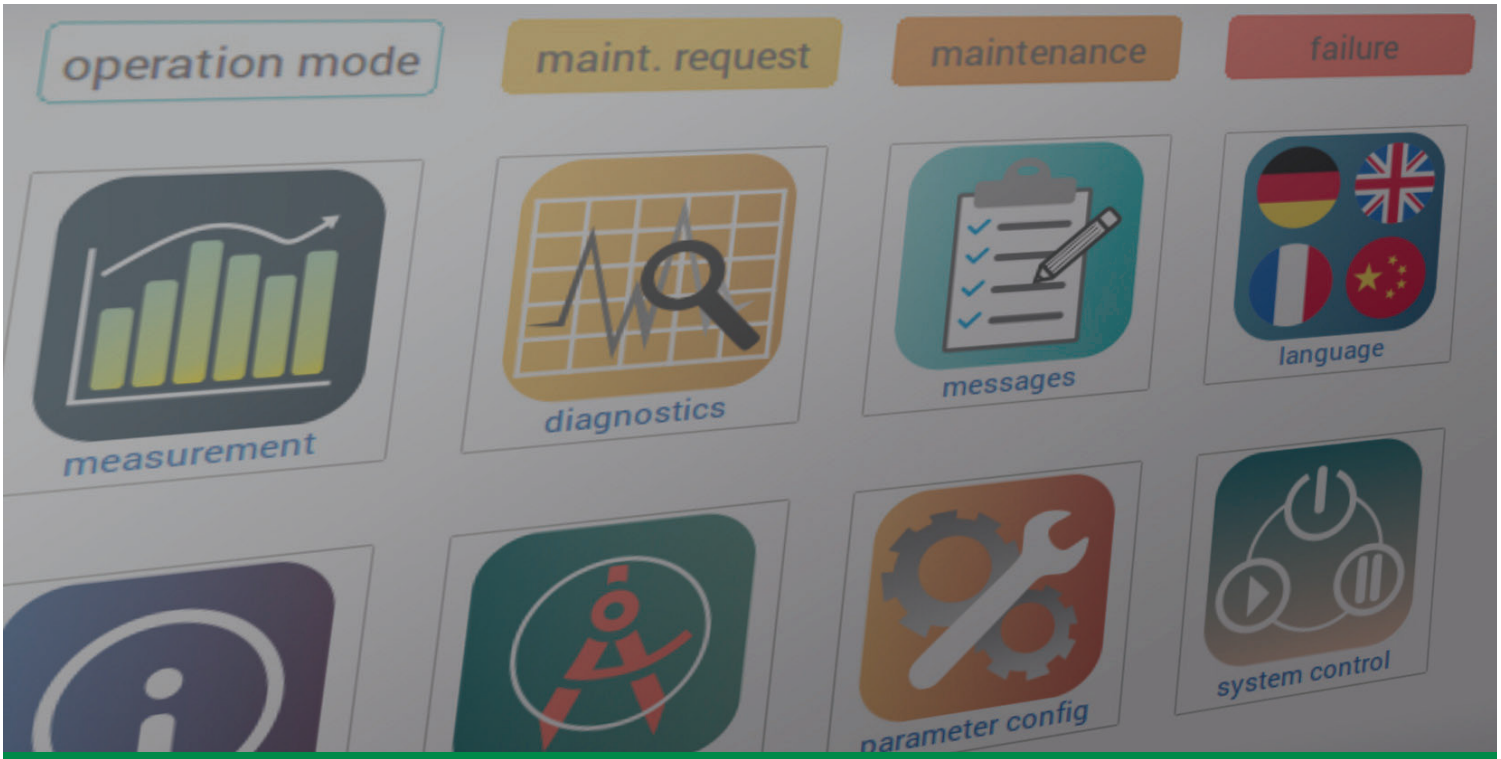
Dr. Födisch
Umweltmesstechnik AG



Product Catalogue

Our device portfolio for you at a glance

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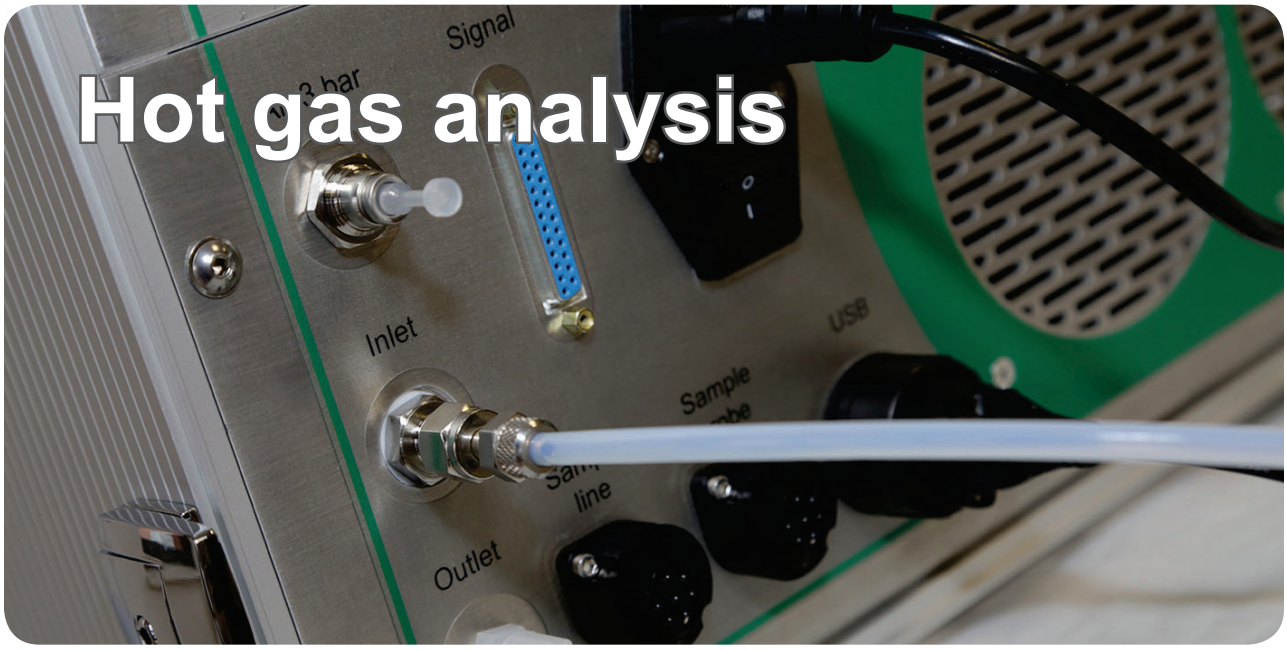
Hot gas analysis



Device manufacturers face the principle challenge to develop simple devices with low demand for maintenance as well as multi-component measuring devices with an option for remote monitoring and service. Device-internal cycles for maintenance and auto-calibration affecting availability have to be reduced to a minimum. Maintenance intervals shall be at least 3 months or even longer (6 months). Moreover a modular construction offers the possibility to minimise time losses due to an optimised spares pooling.

Modern hot-wet gas analysers match perfectly with these requirements. A partial flow of gaseous components is withdrawn by a sampling probe and sampling pipe and led to the analyser. The sample gas is tempered at 185 °C for the whole gas path and monitored for flow and temperature. This high temperature level is necessary in order to prevent from condensing of water-soluble components. The system measures e.g. HCl, NH_3, H_2O, CO, NO, NO_2, CH_4, SO_2 and CO_2.

Oxygen is measured by an integrated zirconium dioxide sensor.

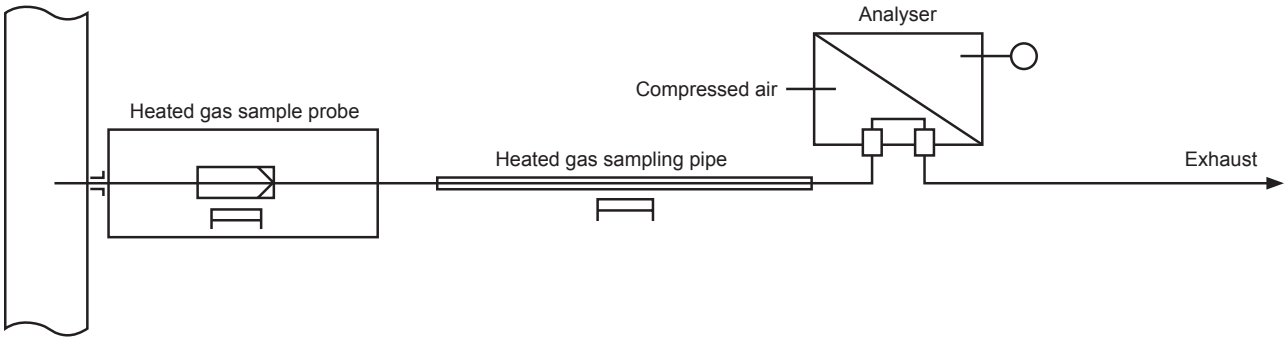
Apart from CEMS installations compliant with EN 15267-3 (QAL1 / MCERTS), it is possible to use the analysers for process measurements, e.g before and after DeNox or DeSox plants. Line switching is another possibility due to its rather easy handling.

Mobile measuring equipment offers high flexibility for special situations, e.g. test installations, reference measurements or for rental purposes.

The hot-wet gas analysers are widely used amongst others in:

- power plants
- incinerators for waste, biomass, sludge and hazardous substances
- pulp and paper industry
- glass melting plants
- cement industry

Example for simplified gas circuit diagram



Hot gas analysers by comparison

	MCA 10 HWIR	MCA 14	MCA 10 m	MCA 14 m	MCA 16 m	UVA 17 HW	UVA 17 HW c	UVA 17 HW m
Field of application								
Process measurement	●	●	●	●	●	●	●	●
TUV-approved CEMS for combustion plants	●[1]							
TUV-approved CEMS for incineration plants	●[1]							
Mobile use			●	●	●			●
Device characteristics								
Measuring principle:								
• Infrared photometer	●	●	●	●	●			
• UV spectrometer						●	●	●
• Zirconium dioxide sensor (O_2)	●	●	●	●	●	●	●	●
• Flame ionisation detector	●[2]							
Data transfer:								
• Analogue outputs 4...20 mA	●	●	●			●	●	●
• Digital outputs (e.g. limit value 1/2, maintenance request, maintenance, failure)	●	●	●			●	●	●
• RS232 / Modbus RTU	●	●	●			●	●	●
• RS485 / Modbus RTU	●	●	●					
• Profibus	●							
• Remote access	●	●	●	●	●	●	●	●
• Signal integration of external signals	●							
Other device features:								
• Integrated display/operating unit						●	●	●
• Detached display/operating unit	●	●	●	●	●			
• Data logger function	●[3]	●[3]	●[3]	●[3]	●[3]	●	●	●
• Integrated thermal printer				●				
• Integrated gas conveyance (ejector resp. pump)	●	●	●	●	●	●	●	●
• Operation without compressed air				●	●			
Measuring components								
Max. quantity of simultaneously detectable components	12	12	12	12	12	12	12	12
Max. quantity of simultaneously output components (for analogue outputs)	12	8	-	-	-	8	8	8
CO Carbon Monoxide	●	●	●	●	●			
CO_2 Carbon Dioxide	●	●	●	●	●			
NO Nitrogen Monoxide	●	●	●	●	●	●	●	●
NO_2 Nitrogen Dioxide	●	●	●	●	●	●	●	●
N_2O Nitrous Oxide	●	●	●	●	●			
NH_3 Ammonia	●	●	●	●	●	●	●	●
SO_2 Sulphur Dioxide	●	●	●	●	●	●	●	●
CH_4 Methane	●	●	●	●	●			
CH_2O Formaldehyde	●	●	●	●				
HCl Hydrogen Chloride	●	●	●	●	●			
HF Hydrogen Fluoride	●		●					
TOC Total Organic Carbon	●[2]							
H_2O Water Vapour	●	●	●	●	●			
O_2 Oxygen	●	●	●	●	●	●	●	●
... other components on request						●	●	●

[1] *suitability tested according to EN 15267-3, certified in compliance with QAL1 and MCERTS Performance Standards*
[2] *by further module in case of system construction;* [3] *only external via USB*

Multi component analyser MCA 10

Extractive measuring system for continuous emission measurement of pollutants in flue gas and for process control

- certified in compliance with MCERTS Performance Standards
- certificate no.: Sira MC140256/01

- certified in compliance with GOST
- certificate no.: МП-242-1852-2015

- EN 15267, QAL1, Cert.-No.: 1729865-ts
- TUV-approved CEMS for combustion and incineration plants (as system part)

APPLICATION

The system design consists basically of three logic units:

- Multi component analyser MCA 10 HWIR
- Visualisation PC with user software
- PLC for analyser system

MEASURING RANGES

	Certific. range	Meas. range 2	Meas. range 3
CO:	0...75 mg/m³	0...300 mg/m³	0...5000 mg/m³
CO_2:	0...25 vol. %	0...50 vol. %	-
NO:	0...80 mg/m³	0...400 mg/m³	0...3000 mg/m³
NO_2:	0...50 mg/m³	0...500 mg/m³	-
N_2O:	0...50 mg/m³	0...3000 mg/m³	-
NH_3:	0...10 mg/m³	0…50 mg/m³	0…500 mg/m³
SO_2:	0...75 mg/m³	0...300 mg/m³	0...2500 mg/m³
CH_4:	0...50 mg/m³	0...500 mg/m³	-
CH_2O[1]:	0...10 mg/m³	0…20 mg/m³	0…100 mg/m³
HCl:	0...15 mg/m³	0...90 mg/m³	0...5000 mg/m³
HF:	-	0...20 mg/m³	-
TOC:	0...15 mg/m³	0...30 mg/m³	0...500 mg/m³
H_2O:	0...40 vol. %	-	-
O_2:	0...25 vol. %	-	-

[1] *suitability test in progress*
Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

- modularly structured hot gas analyser system (without gas cooler), compact 19" format
- up to twelve infrared components
- field-proven components, modern photometer technology
- long operation times, high reliability (6 months maintenance interval)
- pre-calibrated → immediately deployable
- integrated control, integrated zero gas provision
- self-control (additional control of inlet temperature)
- zero point drift control
- remote diagnosis and system setting via Ethernet
- connection of external device (TOC, Hg)

PRECONDITIONS ON SITE

- ambient temperature: 5...40 °C
- installation place indoors and dust-free with protection against percussions/vibrations
- power supply and PC/laptop/tablet* with USB interface (resolution min. 1024 x 768 Pixel; Windows XP Professional upwards for installation of delivered user software)
- instrument air according to ISO 8573.1, class 2
- appropriate gas sampling

** not necessary for system application*

TECHNICAL DATA

Analyser	
Housing:	steel sheet housing, 19" format; IP40; 480 mm x 220 mm x 350 mm (w x h x d), approx. 28 kg
Measuring methods:	• bi-frequency measuring method (NO_2, SO_2, CH_2O[1], HF, H_2O, CO_2) • gas filter correlation (CO, NO, HCl, NH_3, N_2O, CH_4) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 infrared components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Sensitivity correction:	with test gas, once in 6 months (sensitivity tests as standard with a concentration of 80% of the measuring range)
Standardisation:	dry, wet
Gas conveyance:	air-jet pump
Compressed-air connection:	1...4 bar
Display / Operating:	PC connection via USB (e.g. to the control panel in the analyser cabinet)
Interfaces:	2x RS232, USB
Power supply:	110 V bis 230 V, 50/60 Hz, 300 W
Other functions:	gas path continuously heated (standard 185 °C, higher temperatures on request), cross-sensitivity correction, air pressure correction, automatic zero point correction
Analyser cabinet	
Housing:	steel sheet cabinet; 826 mm x 2100 mm x 600 mm (w x h x d), approx. 200...300 kg (dependent on application)
Display / Operating:	integrated 15“ control panel with touch surface, 1024 x 768 Pixel
System	
Ambient conditions:	5...40 °C; relative humidity: max. 90% (non-condensing)
Compressed-air connection:	4...6 bar (dependent on application)
Compressed-air consumption:	approx. 1 m³/h (dependent on application)
Calibration:	• zero point: automatical with instrument air; • span point: with test gas, optionally automatical
Interfaces:	analogue outputs, Modbus, Profibus, further on request
Inputs:	for analogue and digital signals
Outputs:	Analogue outputs: 4...20 mA; Digital outputs: failure, maintenance, maintenance requirement, measuring range switch-over, other
Remote control:	Ethernet, analogue modem
Power supply:	230 V or 400 V / 50 Hz, 350 W (dependent on application) / 4000 W (analyser cabinet, air conditioner, probe) + 125 W/m measuring gas pipe

[1] *suitability test in progress*
Special models are possible on request.

Multi component analyser MCA 14

Extractive measuring system for continuous emission measurement of pollutants in flue gas and for process control

APPLICATION

Basically, the MCA 14 consists of the following device components:

- gas suction and gas distribution
- photometer (consisting of emitter unit, measuring cell and detector unit)
- measuring relevant sensors
- power supply unit
- mainboard

MEASURING RANGES

	Meas. range 1	Meas. range 2
CO:	0...100 mg/m³	0...5000 mg/m³
CO_2:	0...25 vol. %	0...50 vol. %
NO:	0...100 mg/m³	0...3000 mg/m³
NO_2:	0...100 mg/m³	0...2500 mg/m³
N_2O:	0...100 mg/m³	0...3000 mg/m³
NH_3:	0…25 mg/m³	0…500 mg/m³
SO_2:	0...50 mg/m³	0...2500 mg/m³
CH_4:	0...50 mg/m³	0...500 mg/m³
CH_2O:	0...10 mg/m³	0…100 mg/m³
HCl:	0...50 mg/m³	0...5000 mg/m³
H_2O:	0...20 vol. %	0...40 vol. %
O_2:	0...15 vol. %	0...25 vol. %

Other components and measuring ranges on request.

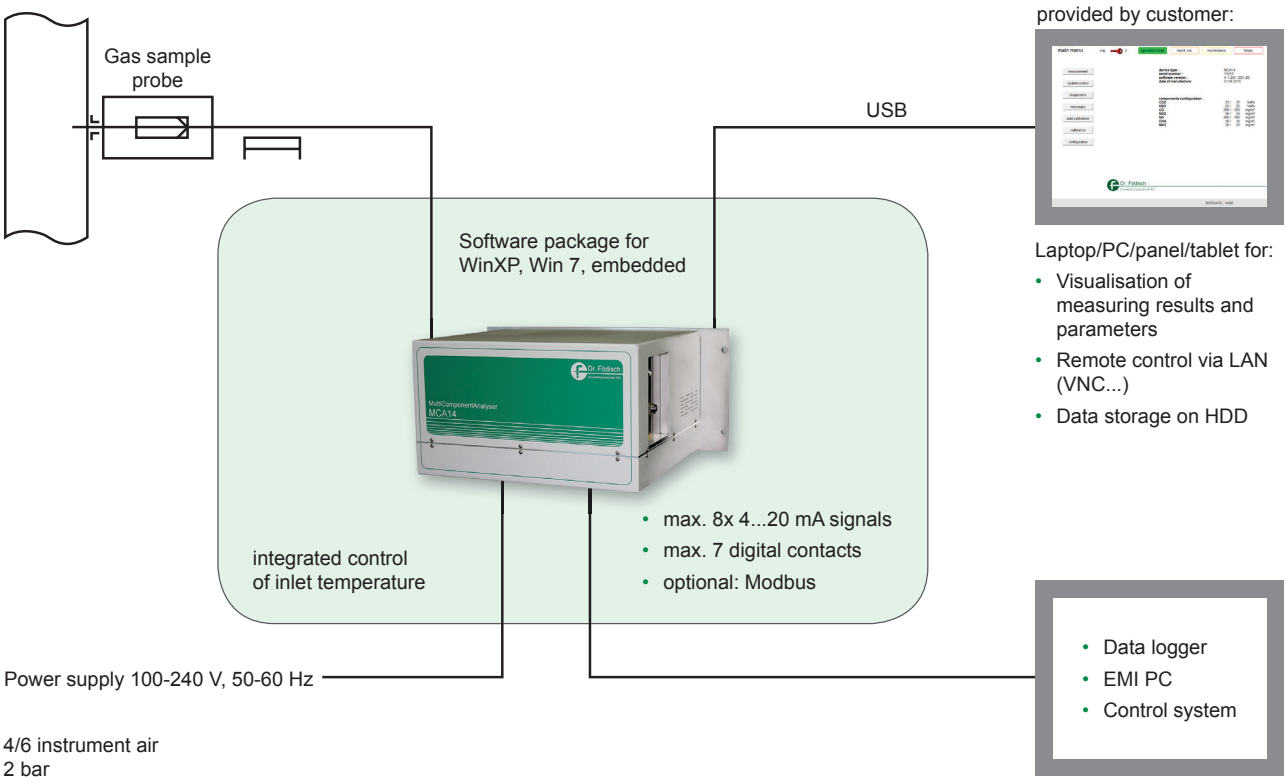
YOUR BENEFITS AT A GLANCE

- continuous, extractive measurement of up to twelve infrared components
- hot gas measurement (without gas cooler)
- compact 19" format with integrated control for easy system integration
- self-control (additional control of inlet temperature)
- integrated zero gas injection

PRECONDITIONS ON SITE

- ambient temperature: 20...35 °C
- relative humidity: max. 90% (non-condensing)
- installation place indoors and dust-free with protection against wetness and percussions/vibrations
- power supply and PC/laptop/tablet with USB interface (resolution min. 1024 x 768 Pixel; Windows XP Professional upwards for installation of delivered user software)
- instrument air according to ISO 8573.1, class 2
- appropriate gas sampling

SYSTEM INTEGRATION



TECHNICAL DATA

Housing:	steel sheet housing, 19" format; IP40; 480 mm x 220 mm x 350 mm (w x h x d), approx. 28 kg
Measuring methods:	• bi-frequency measuring method (NO_2, SO_2, H_2O, CO_2) • gas filter correlation (CO, NO, HCl, NH_3, N_2O, CH_4) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 infrared components (dependent on application) and oxygen
Media temperature:	max. 200 °C
Ambient conditions:	20...35 °C (temperature stability max. ± 3 °C); relative humidity: max. 90% (non-condensing)
Required media:	Instrument air for gas conveyance, zero point calibration as well as purging operation (quality requirements: dew-point -40 °C, < 1 ppm oil-free, dust-free, 2 bar)
Display / Operating:	PC connection via USB provided by customer
Outputs:	• max. 8x 4...20 mA analogue outputs • max. 7 digital output signals possible • optional: Modbus
Power supply:	100...240 V AC, 50-60 Hz, 350 W

Special models are possible on request.

Mobile multi component analyser MCA 10 m

Mobile measuring system for temporary emission measurement of pollutants in flue gas and for process control

APPLICATION

The analyser evaluates internally all specification-depending required concentrations with all necessary compensations and standardisations. The mainboard is responsible for all tasks of photometer control, sensor evaluation, concentration calculation and interface communication. The zero point setting is done fully-automatic with instrument air.

Via USB connection the measuring values are transferred to the delivered PC software.

MEASURING RANGES

	Meas. range 1	Meas. range 2	Meas. range 3
CO:	0...75 mg/m³	0...300 mg/m³	0...5000 mg/m³
CO_2:	0...25 vol. %	0...50 vol. %	-
NO:	0...200 mg/m³	0...400 mg/m³	0...3000 mg/m³
NO_2:	0...50 mg/m³	0...500 mg/m³	-
N_2O:	0...50 mg/m³	0...3000 mg/m³	-
NH_3:	0...10 mg/m³	0…50 mg/m³	0…500 mg/m³
SO_2:	0...75 mg/m³	0...300 mg/m³	0...2500 mg/m³
CH_4:	0...50 mg/m³	0...500 mg/m³	-
CH_2O:	0...10 mg/m³	0…20 mg/m³	0…100 mg/m³
HCl:	0...15 mg/m³	0...90 mg/m³	0...5000 mg/m³
HF:	0...20 mg/m³	-	-
H_2O:	0...40 vol. %	-	-
O_2:	0...25 vol. %	-	-

Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

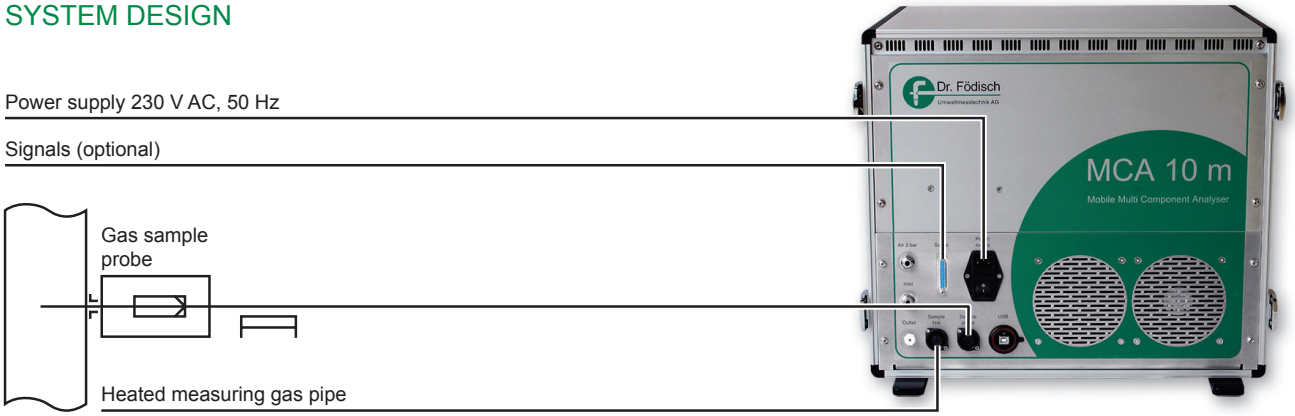
- mobile hot gas analyser system (without gas cooler)
- continuous, extractive measurement of up to twelve infrared components and oxygen
- field-proven components, modern photometer technology
- easy placement directly at the measuring point
- pre-calibrated → immediately deployable
- integrated control
- integrated zero gas provision
- self-control (additional control of inlet temperature)
- visualisation via integrated tablet, with data logger function

PRECONDITIONS ON SITE

- installation place indoors and dust-free with protection against wetness and percussions/vibrations
- power supply and PC/laptop/tablet* with USB interface (resolution min. 1024 x 768 Pixel; Windows XP Professional upwards for installation of delivered user software)
- instrument air according to ISO 8573.1, class 2
- appropriate gas sampling

** tablet as additional device available (option)*

SYSTEM DESIGN



TECHNICAL DATA

Housing:	mobile housing with carrying handles; IP54 (in case of closed housing cover) / IP31 (in case of opened housing cover); 536 mm x 453 mm x 480 mm (w x h x d), approx. 46 kg (depending on fitments)
Measuring methods:	• bi-frequency measuring method (NO_2, SO_2, H_2O, CO_2, HF) • gas filter correlation (CO, NO, HCl, NH_3, N_2O, CH_4) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 infrared components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	operation: 5...40 °C (temperature stability max. ± 5 °C); storage: 5...35 °C (temperature stability max. ± 3 °C); relative humidity: max. 90% (non-condensing)
Zero point correction:	automatical with instrument air
Sensitivity correction:	with test gas, once in 6 months (sensitivity tests as standard with a concentration of 80% of the measuring range)
Standardisation:	dry, wet
Gas conveyance:	injector
Media temperature:	max. 200 °C
Display / Operating:	user software (MCA10m_HID.exe) via USB connection
Data storage:	SSD, data logger function via tablet/ PC
Interfaces:	USB, other optional
Inputs/outputs:	optional
Controller outputs/ maximal power:	• controller of probe: max. 800 W • controller of measuring gas pipe: max. 1000 W
Power supply:	230 V AC, 50 Hz (optional: 115 V AC, 60 Hz), 400 W / max. 2500 W (dependent on periphery)
Other functions:	gas path continuously heated (standard 185 °C, higher temperatures on request), cross-sensitivity correction, air pressure correction

Special models are possible on request.

Mobile multi component analyser MCA 14 m

Mobile measuring system for temporary emission measurement of pollutants in flue gas and for process control

APPLICATION

MCA 14 m measures the concentrations of up to ten infrared gas components and evaluates them internally. Visualisation, operating and data logging are realised via the delivered software.

The unique characteristic is that for operation of the MCA 14 m instrument air supply is NOT necessary. The zero point setting is carried out with ambient air.

MEASURING RANGES

	Meas. range 1	Meas. range 2	Meas. range 3
CO:	0...75 mg/m³	0...300 mg/m³	0...5000 mg/m³
CO_2:	0...25 vol. %	0...50 vol. %	-
NO:	0...100 mg/m³	0...400 mg/m³	0...3000 mg/m³
NO_2:	0...50 mg/m³	0...500 mg/m³	-
N_2O:	0...50 mg/m³	0...3000 mg/m³	-
NH_3:	0...10 mg/m³	0…50 mg/m³	0…500 mg/m³
SO_2:	0...50 mg/m³	0...300 mg/m³	0...2500 mg/m³
CH_4:	0...50 mg/m³	0...500 mg/m³	-
CH_2O:	0...10 mg/m³	0…20 mg/m³	0…100 mg/m³
HCl:	0...15 mg/m³	0...90 mg/m³	0...5000 mg/m³
H_2O:	0...40 vol. %	-	-
O_2:	0...25 vol. %	-	-

Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

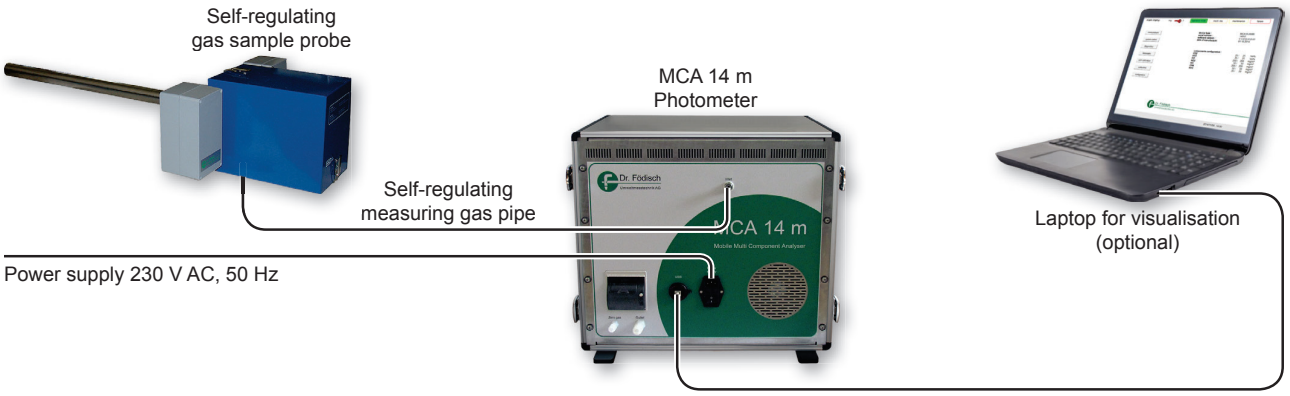
- mobile hot gas analyser system in small format
- no instrument air necessary
- continuous, extractive measurement of up to twelve infrared components and oxygen
- field-proven components, modern photometer technology
- self-sustaining operation by pump supply
- long operation times, high reliability
- easy placement directly at the measuring point
- pre-calibrated → immediately deployable
- integrated zero gas provision with ambient air
- visualisation and operating via delivered software
- integrated printer for data output

PRECONDITIONS ON SITE

- installation place indoors and dust-free with protection against wetness and percussions/vibrations
- provision of non-contaminated ambient air for zero point setting
- power supply and PC/laptop/tablet* with USB interface (resolution min. 1024 x 768 Pixel; Windows XP Professional upwards for installation of delivered user software)
- appropriate gas sampling

** tablet as additional device available (option)*

SYSTEM DESIGN



TECHNICAL DATA

Housing:	mobile housing with carrying handles; IP54 (in case of closed housing cover) / IP31 (in case of opened housing cover); 536 mm x 453 mm x 430 mm (w x h x d), approx. 34 kg (depending on fitments)
Measuring methods:	• bi-frequency measuring method (NO_2, SO_2, H_2O, CO_2) • gas filter correlation (CO, NO, HCl, NH_3, N_2O, CH_4) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 infrared components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	operation: 0...45 °C (temperature stability max. ± 5 °C); storage: 5...35 °C (temperature stability max. 3 K/h); relative humidity: max. 90% (non-condensing)
Zero point correction:	automatical with ambient air
Sensitivity correction:	with test gas, once in 6 months (sensitivity tests as standard with a concentration of 80% of the measuring range)
Standardisation:	dry, wet
Heat-up phase:	ready for operation after approx. 90 min (at ambient temperature of approx. 20 °C)
Media temperature:	max. 200 °C
Display / Operating:	user software (MCA14m_HID.exe) via USB connection, language selectable by software (German, English, Chinese)
Data storage:	data logger function via tablet/PC
Data output:	integrated printer for output of measuring values and device configuration
Interfaces:	USB connection
Power supply:	230 V AC, 50 Hz (optional: 115 V AC, 60 Hz), 510 W
Other functions:	gas path continuously heated (standard 200 °C, higher temperatures on request), cross-sensitivity correction, air pressure correction, gas conveyance by pump
Special models are possible on request.	

Mobile multi component analyser MCA 16 m

Mobile measuring system for temporary emission measurement of pollutants in flue gas and for process control

APPLICATION

MCA 16 m is a hot gas analyser in lightweight 2-case design. It measures the concentrations of up to ten infrared gas components and evaluates them internally. Visualisation, operating and data logging are realised via the delivered software.

The unique characteristic is that instrument air supply is not necessary for its operation. The zero point setting is carried out with ambient air.

MEASURING RANGES

	Meas. range 1	Meas. range 2	Meas. range 3
CO:	0...75 mg/m³	0...300 mg/m³	0...5000 mg/m³
CO_2:	0...25 vol. %	0...50 vol. %	-
NO:	0...100 mg/m³	0...400 mg/m³	0...3000 mg/m³
NO_2:	0...50 mg/m³	0...500 mg/m³	-
N_2O:	0...50 mg/m³	0...3000 mg/m³	-
NH_3:	0...10 mg/m³	0…50 mg/m³	0…500 mg/m³
SO_2:	0...50 mg/m³	0...300 mg/m³	0...2500 mg/m³
CH_4:	0...50 mg/m³	0...500 mg/m³	-
HCl:	0...15 mg/m³	0...90 mg/m³	0...5000 mg/m³
H_2O:	0...40 vol. %	-	-
O_2:	0...25 vol. %	-	-

Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

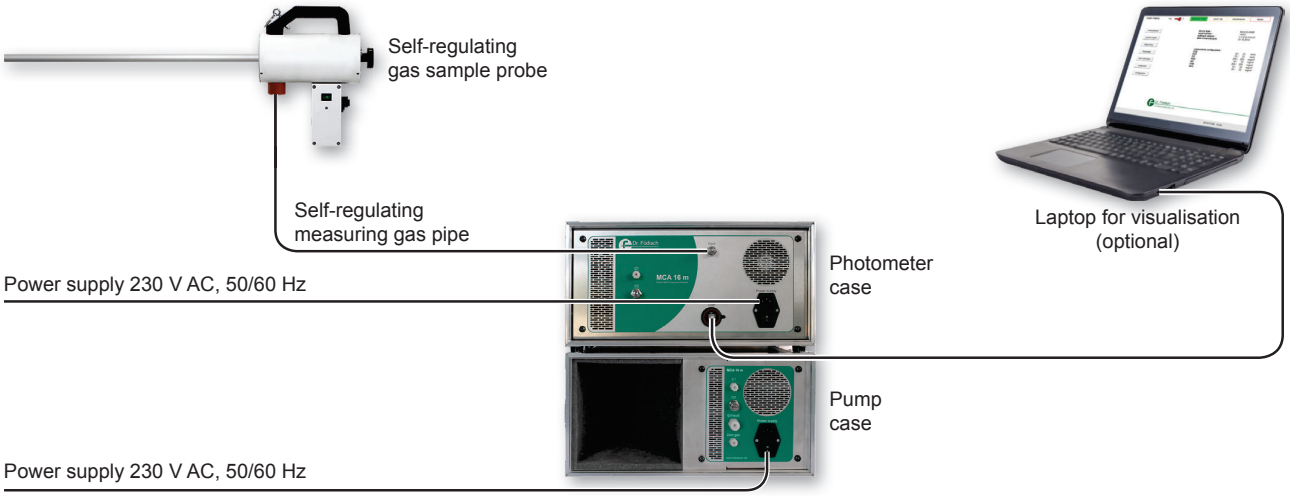
- mobile hot gas analyser system as lightweight 2-case design (without gas cooler)
- no instrument air necessary
- up to twelve infrared components and oxygen
- field-proven components, modern photometer technology
- self-sustaining operation by pump supply
- long operation times, high reliability
- easy placement directly at the measuring point
- pre-calibrated → immediately deployable
- integrated zero gas provision with ambient air
- visualisation and operating via delivered software

PRECONDITIONS ON SITE

- installation place indoors and dust-free with protection against wetness and percussions/vibrations
- provision of non-contaminated ambient air for zero point setting
- power supply and PC/laptop/tablet* with USB interface (resolution min. 1024 x 768 Pixel; Windows XP Professional upwards for installation of delivered user software)
- appropriate gas sampling

** tablet as additional device available (option)*

SYSTEM DESIGN



TECHNICAL DATA

Housing:	mobile housing as lightweight 2-case design, IP30; 475 mm x 245 mm x 245 mm (w x h x d); weight: photometer case 19.5 kg, pump case 9.5 kg (depending on fitments)
Measuring methods:	• bi-frequency measuring method (NO_2, SO_2, H_2O, CO_2) • gas filter correlation (CO, NO, HCl, NH_3, N_2O, CH_4) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 infrared components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	0...40 °C (temperature stability max. 5 K/h); relative humidity: max. 90% (non-condensing)
Pressure measurement:	measuring range: 0...1600 mbar, accuracy: ± 0.1%
Flow measurement:	measuring range: 0...1000 l/h, accuracy: ± 2%
Sensitivity correction:	with test gas, once in 6 months (sensitivity tests as standard with a concentration of 80% of the measuring range)
Standardisation:	dry, wet
Calibration:	automatically with ambient air, manually with nitrogen
Gas conveyance:	bellows pump (in separate pump case), compressed-air connection not necessary
Heat-up phase:	2 to 3 hours
Media temperature:	max. 200 °C
Display / Operating:	operating software via USB connection; storage function via tablet/laptop
Power supply:	230 V AC, 50/60 Hz (per case), 350 W (photometer case) / 100 W (pump case)
Other functions:	gas path continuously heated (standard 185 °C, higher temperatures on request), cross-sensitivity correction, air pressure correction
Special models are possible on request.	

Hot gas UV analyser UVA 17 HW

Hot-wet spectrometer-based gas analyser for measurement of pollutants in flue gas with low concentrations and for process control

APPLICATION

The UV analyser UVA 17 HW can be used for monitoring of e.g. NO, NO_2, NH_3, SO_2 and O_2 in incineration plants as well as for process measurements in the chemical and pharmaceutical industry.

This analyser is based on a heated spectrometer and measures all UV absorbing gas components. An ejector supplies the sample gas. Due to the heated measuring cell (200 °C) an elaborate gas conditioning is not required. The applied Xenon flash light is characterised by a 2 to 3 times higher lifetime compared to other light sources.

The integrated zirconium dioxide sensor serves the oxygen measurement. A small PC with 7" colour display and an app-based menu allow an intuitive operation on site as well as remotely.

LOWEST MEASURING RANGES

Component	Analyser with short path cell	Analyser with long path cell
NO:	0...100 mg/m³	0...50 mg/m³
NO_2:	0...200 mg/m³	0...100 mg/m³
NH_3:	0...30 mg/m³	0...10 mg/m³
SO_2:	0...100 mg/m³	0...50 mg/m³
O_2:	0...25 vol. %	0...25 vol. %

Other components and measuring ranges on request.

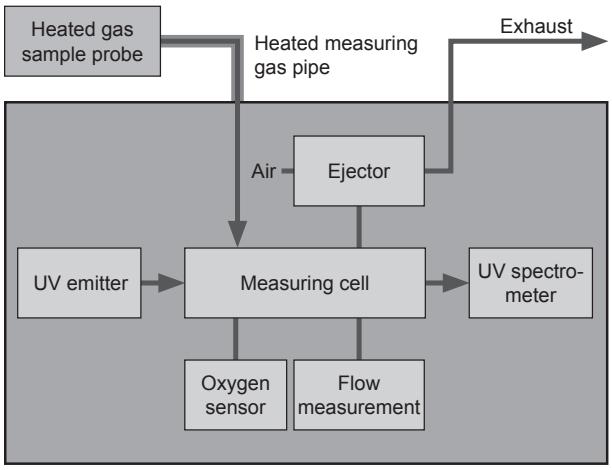
YOUR BENEFITS AT A GLANCE

- compact design
- long-term stable signal
- hot gas measurement up to 200 °C
- no gas conditioning, no gas cooler needed
- low-maintenance measuring gas conveyance by ejector
- user-friendly touch display
- extension of measuring components without additional hardware possible
- remote access

PRECONDITIONS ON SITE

- installation place indoors and dust-free
- protection against wetness
- protection against percussions/vibrations
- instrument air according to ISO 8573.1, class 2
- appropriate gas sampling

SCHEMATIC DESIGN



FUNCTION

The function of the UV analyser is based on the measurement of an integrated spectrometer in the spectral range of ultraviolet radiation of 180 to 400 nm. Fundamentally, the device is composed of light source, measuring cell and spectrometer which are interconnected via the optical path. The emitted radiation is absorbed partly by the process gas in the measuring cell and detected by a spectrometer afterwards. By using a chemometric model the gas component as well as the concentration can be determined.

Because of the modular design, there is the possibility for application of different spectrometers for adaptation to variable requirements.

TECHNICAL DATA

Housing:	robust housing with compact 19" format, IP40; 483 mm x 133 mm x 350 mm (w x h x d), approx. 12 kg
Measuring methods:	• spectrometer 180-400 nm (NO_2, SO_2, NO, NH_3) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	5...40 °C (temperature stability max. 5 K/h); humidity: max. 90% (non-condensing)
Optical bench:	• gas path: continuously heated, standard 200 °C (higher temperatures on request) • path length of measuring cell: adjustable - short path cell: 260 mm - long path cell: 730 mm • particle filter: 2 µm
Zero point setting:	automatically with instrument air
Measuring gas conveyance:	via ejector
Display / Operating:	7“ touch display, 800 x 480 Pixel, status messages for failure, maintenance and maintenance request; Language selection: German, English, French, Chinese
Data storage:	data logger function
Interfaces:	RS232 (Modbus)
Inputs/outputs:	• 8 analogue outputs, 4...20 mA, potential-free, burden max. 500 Ω • 14 digital inputs (optocoupler), max. 30 V • 16 digital outputs, potential-free, max. 60 V, 500 mA
Remote control:	VNC, remote control via PC
Power supply:	110-250 V AC / 50-60 Hz, 350 W
Other functions:	integrated flow measurement; integrated pressure monitoring

Special models are possible on request.

Hot gas UV analyser UVA 17 HW c

Wall-mounted hot-wet gas analyser for measurement of pollutants in flue gas with low concentrations and for process control

APPLICATION

The UV analyser UVA 17 HW can be used for monitoring of e.g. NO, NO_2, NH_3, SO_2 and O_2 in incineration plants as well as for process measurements in the chemical and pharmaceutical industry.

This analyser is based on a heated spectrometer and measures all UV absorbing gas components. An ejector supplies the sample gas. Due to the heated measuring cell (200 °C) an elaborate gas conditioning is not required. The applied Xenon flash light is characterised by a 2 to 3 times higher lifetime compared to other light sources.

The integrated zirconium dioxide sensor serves the oxygen measurement. A small PC with 7" colour display and an app-based menu allow an intuitive operation on site as well as remotely.

LOWEST MEASURING RANGES

Component	Analyser with short path cell	Analyser with long path cell
NO:	0...100 mg/m³	0...50 mg/m³
NO_2:	0...200 mg/m³	0...100 mg/m³
NH_3:	0...30 mg/m³	0...10 mg/m³
SO_2:	0...100 mg/m³	0...50 mg/m³
O_2:	0...25 vol. %	0...25 vol. %

Other components and measuring ranges on request.

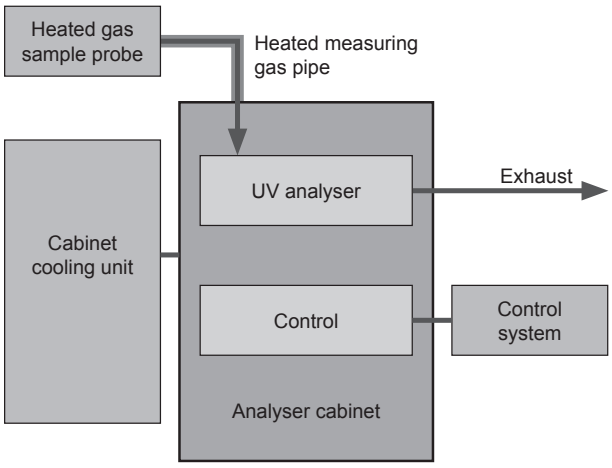
YOUR BENEFITS AT A GLANCE

- compact design
- long-term stable signal
- hot gas measurement up to 200 °C
- no gas conditioning, no gas cooler needed
- low-maintenance measuring gas conveyance by ejector
- user-friendly touch display
- extension of measuring components without additional hardware possible
- remote access

PRECONDITIONS ON SITE

- installation place indoors and dust-free
- protection against wetness
- protection against percussions/vibrations
- instrument air according to ISO 8573.1, class 2
- appropriate gas sampling

SCHEMATIC DESIGN



FUNCTION

The function of the UV analyser is based on the measurement of an integrated spectrometer in the spectral range of ultraviolet radiation of 180 to 400 nm. Fundamentally, the device is composed of light source, measuring cell and spectrometer which are interconnected via the optical path. The emitted radiation is absorbed partly by the process gas in the measuring cell and detected by a spectrometer afterwards. By using a chemometric model the gas component as well as the concentration can be determined.

Because of the modular design, there is the possibility for application of different spectrometers for adaptation to variable requirements.

TECHNICAL DATA

Housing:	steel sheet cabinet; 850 mm x 600 mm x 500 mm (w x h x d), approx. 55 kg
Measuring methods:	• spectrometer 180-400 nm (NO_2, SO_2, NO, NH_3) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	5...40 °C (temperature stability max. 5 K/h); humidity: max. 90% (non-condensing)
Optical bench:	• gas path: continuously heated, standard 200 °C (higher temperatures on request) • path length of measuring cell: adjustable - short path cell: 260 mm - long path cell: 730 mm • particle filter: 2 µm
Zero point setting:	automatically with instrument air
Measuring gas conveyance:	via ejector
Display / Operating:	7“ touch display, 800 x 480 Pixel, status messages for failure, maintenance and maintenance request; Language selection: German, English, French, Chinese
Data storage:	data logger function
Interfaces:	RS232 (Modbus)
Inputs/outputs:	• 8 analogue outputs, 4...20 mA, potential-free, burden max. 500 Ω • 14 digital inputs (optocoupler), max. 30 V • 16 digital outputs, potential-free, max. 60 V, 500 mA
Remote control:	VNC, remote control via PC
Power supply:	110-250 V AC / 50-60 Hz, 350 W
Other functions:	integrated flow measurement; integrated pressure monitoring

Special models are possible on request.

Mobile hot gas UV analyser UVA 17 HW m

Mobile hot-wet gas analyser for power plant optimisation, low concentration measurement and process control

APPLICATION

The UV analyser UVA 17 HW m can be used for monitoring of e.g. NO, NO_2, NH_3, SO_2 and O_2 in incineration plants as well as for process measurements in the chemical and pharmaceutical industry.

This analyser is based on a heated spectrometer and measures all UV absorbing gas components. An ejector supplies the sample gas. Due to the heated measuring cell (200 °C) an elaborate gas conditioning is not required. The applied Xenon flash light is characterised by a 2 to 3 times higher lifetime compared to other light sources.

The integrated zirconium dioxide sensor serves the oxygen measurement. A small PC with 7" colour display and an app-based menu allow an intuitive operation on site as well as remotely.

LOWEST MEASURING RANGES

Component	Analyser with short path cell	Analyser with long path cell
NO:	0...100 mg/m³	0...50 mg/m³
NO_2:	0...200 mg/m³	0...100 mg/m³
NH_3:	0...30 mg/m³	0...10 mg/m³
SO_2:	0...100 mg/m³	0...50 mg/m³
O_2:	0...25 vol. %	0...25 vol. %

Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

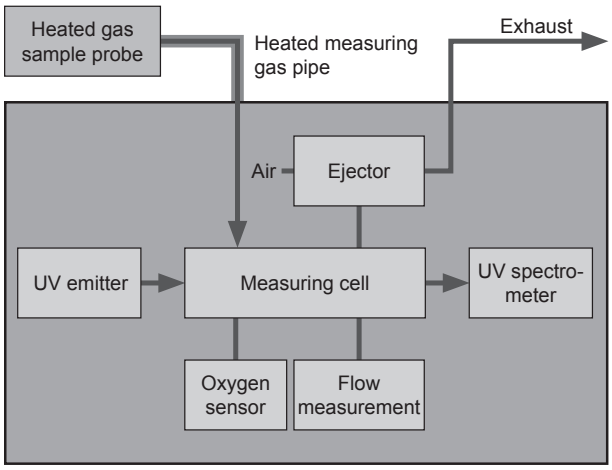
- mobile hot-wet gas analyser in compact design
- easy placement directly at the measuring point
- long-term stable signal
- hot gas measurement up to 200 °C
- no gas conditioning, no gas cooler needed
- low-maintenance measuring gas conveyance by ejector
- user-friendly touch display
- extension of measuring components without additional hardware possible
- remote access

PRECONDITIONS ON SITE

- installation place indoor and dust-free
- protection against wetness
- protection against percussions/vibrations
- instrument air* according to ISO 8573.1, class 2
- appropriate gas sampling

** instrument air supply unit available (option)*

SCHEMATIC DESIGN



FUNCTION

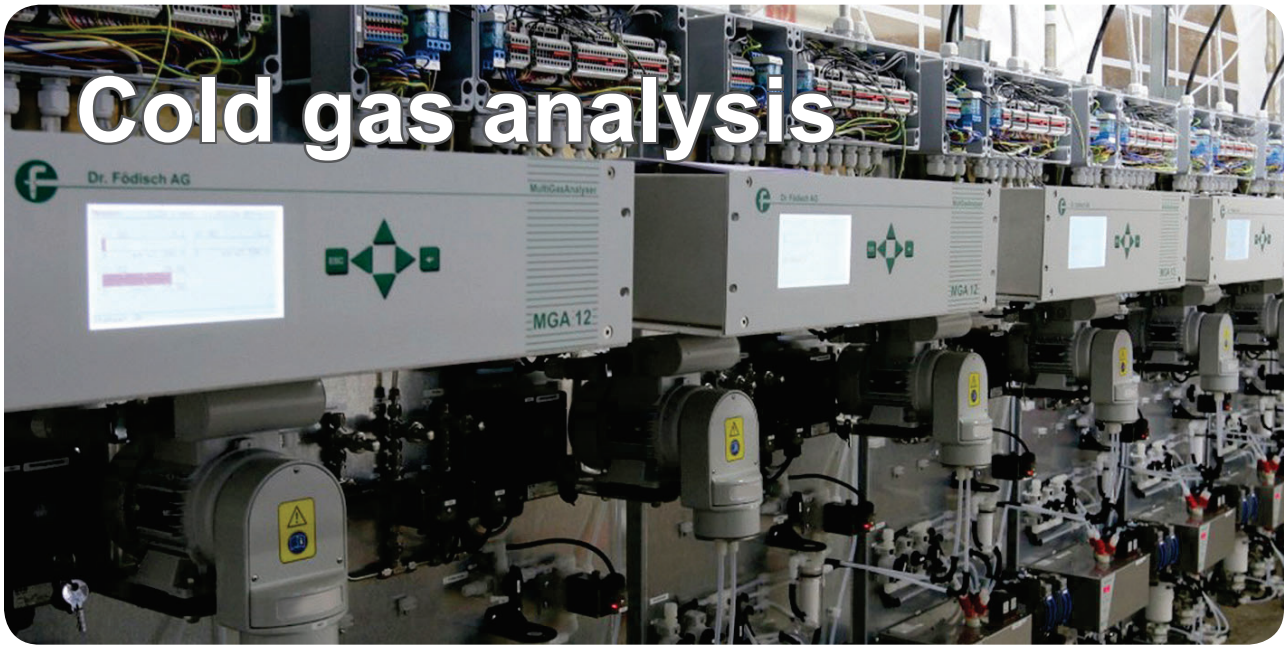
The function of the UV analyser is based on the measurement of an integrated spectrometer in the spectral range of ultraviolet radiation of 180 to 400 nm. Fundamentally, the device is composed of light source, measuring cell and spectrometer which are interconnected via the optical path. The emitted radiation is absorbed partly by the process gas in the measuring cell and detected by a spectrometer afterwards. By using a chemometric model the gas component as well as the concentration can be determined.

Because of the modular design, there is the possibility for application of different spectrometers for adaptation to variable requirements.

TECHNICAL DATA

Housing:	robust housing with compact 19" format, IP40; design as portable case; 530 mm x 162 mm x 530 mm (w x h x d), approx. 20 kg
Measuring methods:	• spectrometer 180-400 nm (NO_2, SO_2, NO, NH_3) • zirconium dioxide sensor (O_2)
Number of meas. components:	up to 12 components (dependent on application) and oxygen
Accuracy:	< 2% of the respective measuring range
Ambient conditions:	5...40 °C (temperature stability max. 5 K/h); humidity: max. 90% (non-condensing)
Optical bench:	• gas path: continuously heated, standard 200 °C (higher temperatures on request) • path length of measuring cell: adjustable - short path cell: 260 mm - long path cell: 730 mm • particle filter: 2 µm
Zero point setting:	automatically with instrument air
Measuring gas conveyance:	via ejector
Display / Operating:	7“ touch display, 800 x 480 Pixel, status messages for failure, maintenance and maintenance request; Language selection: German, English, French, Chinese
Data storage:	data logger function
Interfaces:	RS232 (Modbus)
Inputs/outputs:	• 8 analogue outputs, 4...20 mA, potential-free, burden max. 500 Ω • 14 digital inputs (optocoupler), max. 30 V • 16 digital outputs, potential-free, max. 60 V, 500 mA
Remote control:	VNC, remote control via PC
Power supply:	110-250 V AC / 50-60 Hz, 350 W
Other functions:	integrated flow measurement; integrated pressure monitoring
Optional:	• instrument air conveyance unit • gas sampling equipment
Special models are possible on request.	

Cold gas analysis



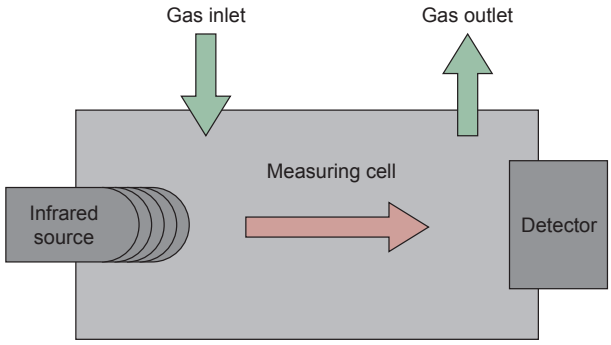
Cold-dry measurement is – same like hot-wet measurement – based on the extractive working principle. A partial flow of gaseous components is withdrawn by a sampling probe and sampling pipe and led to the analysis cabinet. A gas conditioning inside the cabinet cools the sample gas to 5 °C to dry the gas for analysis. Depending on the pollutants various analyser modules and measuring principles can be applied (UV spectrometer, NDIR photometer, electrochemical cell, paramagnetic or thermal conductivity sensor). Based on customer requirements the most efficient method for each component is chosen.

Apart from CEMS installations based on MGA 12 being in compliance with EN 15267-3 (QAL1), it is possible to use the analyser for process measurements, e.g. for ΔCO- or ΔNO-measurements.

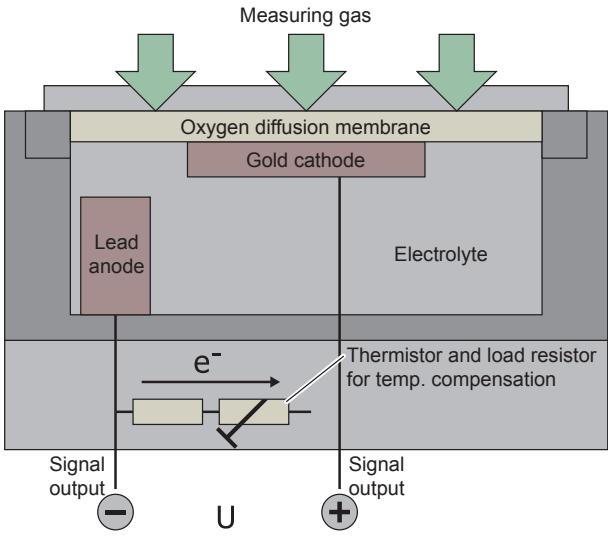
The cold-dry gas analysers are widely used amongst others in:

- power plants
- biomass boilers
- coal mills
- coke plants
- pulp and paper industry
- chemical industry

Scheme of infrared absorption



Scheme of electrochemical cell



Cold gas analysers by comparison

	MGA 12	MGA 12 EX	UVA 17 CD	UVA 17 CD m
Field of application				
Process measurement	●	●	●	●
TUV-approved CEMS for combustion plants	●[1]			
Application in potentially explosive atmospheres (ATEX)		●		
Mobile use	●[2]			●
Device characteristics				
Measuring principle:				
• Infrared photometer	●	●		
• UV spectrometer			●	●
• Electrochemical cell	●	●	●	●
• Paramagnetic measuring method (O_2)	●	●		
• Thermal conductivity sensor (H_2)	●	●		
Data transfer:				
• Analogue outputs 4...20 mA	●	●	●	●
• Digital outputs (e.g. limit value 1/2, maintenance request, maintenance, failure)	●	●	●	●
• RS232 / Modbus RTU	●	●	●	●
• Remote access	●	●	●	●
Other device features:				
• Integrated display/operating unit	●	●	●	●
• Detached display/operating unit				
Measuring components				
Max. quantity of simultaneously detectable components	8	5	12	12
Max. quantity of simultaneously output components (for analogue outputs)	5	5	8	8
CO Carbon Monoxide	●	●		
CO_2 Carbon Dioxide	●	●		
NO Nitrogen Monoxide	●	●	●	●
NO_2 Nitrogen Dioxide	●[3]	●	●	●
N_2O Nitrous Oxide	●	●		
SO_2 Sulphur Dioxide	●	●	●	●
CH_4 Methane	●[3]	●		
H_2 Hydrogen	●[3]	●[3]		
H_2S Hydrogen Sulfide	●[3]	●		
O_2 Oxygen	●	●	●	●

[1] *suitability tested according to EN 15267-3, certified in compliance with QAL1 and MCERTS Performance Standards*
[2] *on request as special model*
[3] *not part of the suitability test*

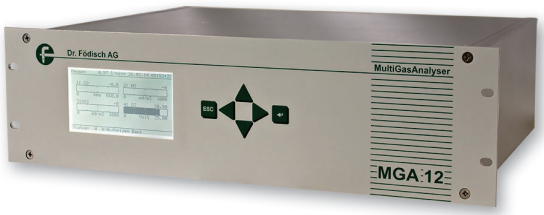
Multi gas analyser MGA 12

Cold gas measuring system for continuous emission measurement of pollutants in flue gas and for process control

- certified in compliance with MCERTS Performance Standards
- certificate no.: Sira MC180342/00

- certified in compliance with GOST
- certificate no.: МП-242-1746-2014

- suitability tested
- EN 15267-3
- QAL1 certified
- regular surveillance
- TUV approved
- ID 0000039321
- TUV-approved CEMS for combustion plants (as system part)



APPLICATION

In the MGA 12 four independent, selectively working measuring methods apply: infrared absorption (NDIR), electrochemical cell and paramagnetic measuring method as well as thermal conductivity sensor.

MEASURING RANGES

	Meas. range 1	Meas. range 2
CO:	0...125 mg/m³ (0...100 ppm)	0...1000 mg/m³ (0...800 ppm)
CO_2:	0...20 vol. %	-
NO:	0...300 mg/m³ (0...225 ppm)	0...1000 mg/m³ (0...750 ppm)
NO_2 [1]:	0...200 mg/m³ (0...95 ppm)	0...1000 mg/m³ (0...485 ppm)
N_2O [1]:	0...300 mg/m³ (0...155 ppm)	0...1000 mg/m³ (0...510 ppm)
SO_2:	0...200 mg/m³ (0...70 ppm)	0...1000 mg/m³ (0...350 ppm)
CH_4 [1]:	0...300 mg/m³ (0...420 ppm)	0...1000 mg/m³ (0...1400 ppm)
H_2 [1] [2]:	0...5 vol. %	0...100 vol. %
H_2S [1] [3]:	0...75 mg/m³ (0...50 ppm)	-
O_2 [3] [4]:	0...25 vol. %	-

[1] *not part of the suitability test*
[2] *measurement via thermal conductivity sensor* [1]
[3] *measurement via electrochemical cell*
[4] *measurement via paramagnetic sensor* [1]
Other components and measuring ranges on request.

YOUR BENEFITS AT A GLANCE

- simultaneous measurement of up to eight gas components with limit value signalling and measuring range change-over
- two separated gas paths possible
- local diagnosis of the system state
- display of bar diagram for every component
- flow control as well as display of flow rate
- reduced cross-sensitivities by internal spectral filter
- internal monitoring for condensate ingress with switch contact for pump switch-off
- control of a back-purging probe (interval and pulse time)
- control of zero point drift
- low maintenance requirement

PRECONDITIONS ON SITE

- ambient temperature: 5...30 °C (with air conditioner 5...45°C)
- installation place indoors and dust-free
- protection against wetness
- protection against percussions/vibrations