ecom

INTELLIGENT MESSEN!
MEASURE WITH INTELLIGENCE!

ecom® J2KN^pro TECH

Mobile emission measurement with physical measuring methods

ADDRESS

AM GROSSEN TEICH 2
D-58640 ISERLOHN

TEL.: +49 (0) 2371 | 945 - 5
FAX: +49 (0) 2371 | 40305
info@ecom.de
www.ecom.de

ecom GMBH

ecom PRODUCTS OFFER YOU MANY BENEFITS...

EXTREMELY EFFICIENT.

The high output level (up to 2.6 liters/ minute) not only enables ecom analyzers to provide a fast reading: It also makes it possible to bridge long distances during sampling, or negative pressure in the application. Manometers also provide readings in record time.

EXTREMELY ACCURATE.

The reading accuracy of gas sensors (CO, NO, SO_2) is determined and adjusted at 5, 20 and 40°C in the climatic test chamber using standarized test gases. High-quality sensors provide a perfect reading for pressure measurements.

EXTREMELY COMPLETE.

ecom analyzers are sold and designed as an entity (device, probe, probe hose, case). In addition: Printer paper and filter, a solid shoulder strap, PC software and Apps.

EXTREMELY COOL.

The drier, the better: The gas to be measured is continually cooled to 5°C using a gas cooler. This way, the drying processis controlled. Collected condensate can be easily emptied in some cases this occurs in automatic mode.

EXTREMELY FAR-REACHING.

ecom analyzers communicate wirelessly: Via Bluetooth as well as radio (highest range with the most stable connection). This way instruments can be remote-controlled via e.g smartphones or ecom remote control unit.

EXTREMELY ROBUST.

Hard on the outside - even harder on the inside! Almost all ecom measuring devices are housed in an ultra-light aluminium casing. Its durability pays off in its daily use - especially in rougher conditions.

EXTREMELY SAFE.

The condensation control protects from moisture. An automatic CO shut-off (flushing of the CO sensor) without interruption of the measuring process ensures the long lifespan of the CO sensor. Each ecom instrument has its own „safety equipment.“

EXTREMELY LOSS-FREE.

To measure the full concentration of extremly water soluble gases an inner PTFE coated hose or a heated sampling system are available. This guarantees the fast and condensate free flue gas transport.

ecom®

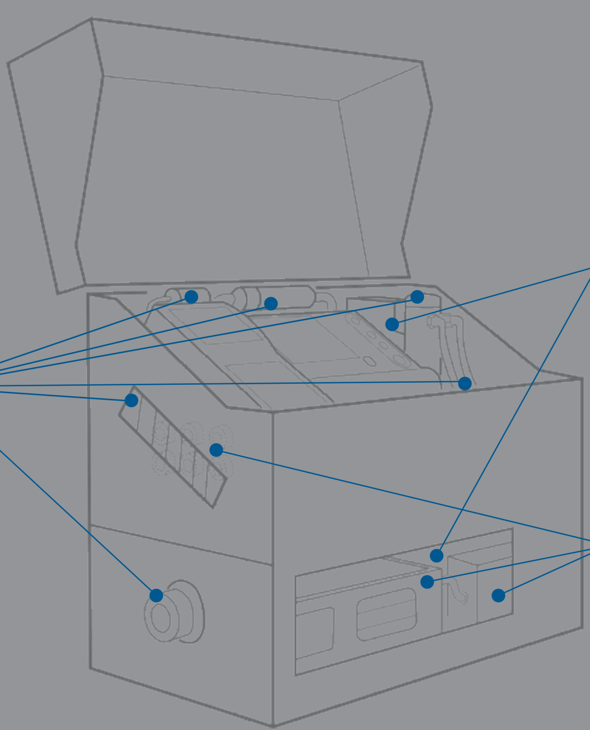
...BY EVERY APPLICATION.

FREE COMBINATION AND PERFECT MATCH OF THE MEASUREMENT METHODS FOR EACH APPLICATION

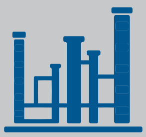
- Electrochemical sensors for high measurement ranges
- Physical sensors for low-maintenance measurements, also in overload range
- High-precision PAS module, CLD standard method with converter, NDIR technology and NDUV module

SHORT CONTROLS OR CONTINUOUS MEASUREMENTS

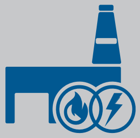
- Completely ready for use for short and long term measurements
- High-quality sensor technology, efficient gas conditioning, reliable filtration
- Wireless remote control with high coverage and vaious data output possibilities



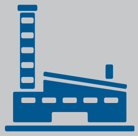
REFINERY



INCINERATION PLANT



COGENERATION



INDUSTRIAL PROCESS

POWER PLANT

Overview of technical data

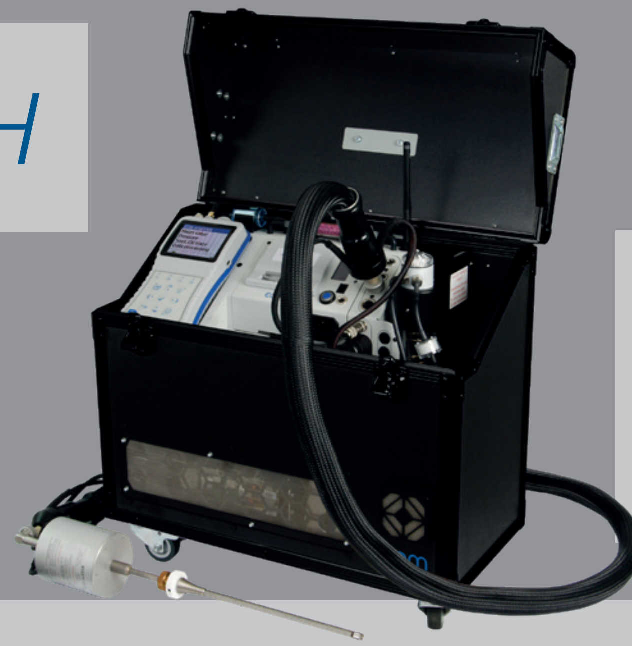
Measurement method	Electrochemical Sensors (EC)			Chemiluminescence (CLD)			Photoacoustic Spectroscopy (PAS)		
APPLICATION	Quasi-continuous measurements (air purge after >120 minutes required; measurement > 48 h not recommended)			Continuous measurements also possible in mobile use with monitoring (filters, gas process etc.)			Continuous measurements also possible in mobile use with monitoring (filters, gas process etc.)		
MAXIMUM NUMBER OF GAS COMPONENTS	6			2 (incl. converter)			1		
GAS COMPONENTS For a given gas component, one measurement method only can be chosen	Measurement Range	Resolution	Accuracy	Measurement Range	Resolution	Accuracy	Measurement Range	Resolution	Accuracy
Oxygen O_2	0...21 %	0,01 vol. %	± 0,3 vol. %						
Carbon Monoxide CO	0...10.000 ppm (2)	1 ppm	± 20 ppm resp. 5% of measurement value (1)						
	0...63.000 ppm	5 ppm	± 100 ppm resp. 10% of measurement value (1)						
Carbon Dioxide CO_2	Calculation via O_2-value								
Nitrogen Monoxide NO	0...5.000 ppm	1 ppm	± 5 ppm resp. 5% of measurement value (1)	0-1.000 ppm	0,1 ppm	± 2% of full scale			
	0...500 ppm	0,1 ppm	± 2 ppm resp. 5% of measurement value (1)						
Nitrogen Dioxide NO_2	0...1.000 ppm	1 ppm	± 5 ppm resp. 5% of measurement value (1)	0-1.000 ppm (4)	0,1 ppm (4)	± 2% of full scale	0-200 ppm	0,1 ppm	± 2% of full scale
	0...100 ppm	0,1 ppm	± 5 ppm rep. 5% of measurement value (1)						
Nitrogen Oxides NO_x	calculated out of NO/NO_2 Measurement			via converter: Transformation of NO_2 to NO + measurement via CLD: No original NO_2 measurement possible Recommendation: Combination of NO measurement (CLD) and NO_2 measurement (PAS)			In combination with CLD = perfect for an exact and continuous NO_x measurement		
Sulphur Dioxide SO_2	0...5.000 ppm	1 ppm	± 10 ppm resp. 5% of measurement value (1)						
Hydrogen H_2	0...20.000 ppm	1 ppm	±100 ppm resp. 5% of measurement value (1)						
Hydrogen Sulphide H_2S	0...1.000 ppm	1 ppm	±10 ppm resp. 5% of measurement value (1)						
Hydrocarbons C_xH_y (calibrated on CH_4)									
Hydrocarbons C_xH_y (calibrated on CH_4)									
Hydrocarbons C_xH_y (calibrated on C_3H_8)									

(1) Higher value prevails
(2) H_2-compensated; safety shut-off at 4.000 ppm
(3) Because of solubility of these gas components a measurement is just possible under dry conditions

Non dispersive Infra-red Technology (NDIR) ADVANCED			Non dispersive Infra-red Technology (NDIR) STANDARD			Catalytic Measurement (Pellistor)			Non dispersive Ultaviolet Technology (NDUV)		
Continuous measurements also possible in mobile use with monitoring (filters, gas process etc.)			Quasi-continuous measurements (air purge after > 60 minutes required; measurement > 48 h not recommended)			Quasi-continuous measurements (air purge after > 60 minutes required; measurement > 48h not recommended)			Continuous measurements also possible in mobile use with monitoring (filters, gas process etc.)		
max. 3 (also possible in connection with NDIR-STANDARD components)			3 (also possible in connection with NDIR-ADVANCED-components)			1			3 (2-channel with NO_2 / SO_2 or 3-channel witz NO / NO_2 /SO_2)		
Measurement Range	Resolution	Accuracy	Measurement Range	Resolution	Accuracy	Measurement Range	Resolution	Accuracy	Measurement Range	Resolution	Accuracy
0...1.000 ppm (5)	1 ppm	± 2% of full scale	0...63.000 ppm	10 ppm	± 200 ppm resp. 3% of measurement value (1)						
0...20 vol. %	0,01 vol. %	± 2% of full scale	0...20 vol. %	0,01 vol. %	± 0,3 vol. % resp. 3% of measurement value (1)						
									0...300 (2.000) ppm	0,1 ppm	± 3 ppm (1 % of measurement value)
									0...300 (2.000) ppm	0,1 ppm	± 3 ppm (1 % of measurement value)
									0...100 ppm	0,1 ppm	± 2 ppm resp. 2% of measurement value (1)
0...1.000 ppm (5)	1 ppm	± 2% of full scale							0...300 (2.000) ppm	0,1 ppm	± 3 ppm (1 % of measurement value)
									0...100 ppm	0,1 ppm	± 2 ppm resp. 2% of measurement value (1)
						0...4 vol. %	0,01 vol. %	upon request			
			0...30.000 ppm	10 ppm	± 50 ppm resp. 3% of measurement value (1)						
			0...2.000 ppm	1 ppm	± 4 ppm resp. 3% of measurement value (1)						

(4) NO_x measurement via converter
(5) The measurement accuracy with an IR-Sensor of SO_2 is only guranteed up to max. 2.000 ppm CO

ecom® J2KN^{pro}TECH



ecom-J2KNpro TECH

POWERFUL EMISSION ANALYZER WITH DIFFERENT MEASURING METHODS

- Mobile emission analysis with physical measurement procedures
- Physical measurement procedures can be combined at choice with electrochemical procedures
- Measurement methods can be combined according to the needs in accuracy and duration
- Radio remote control with high coverage
- Multiple cooling of gas
- Brushless high-performing pump
- High-performance lithium ion battery
- Robust aluminum housing build in aluminum-framed case
- Maximum equipment of all sensor components possible
- Heated sampling system with pre-filter and heated tubing
- Multiple sampling gas filtering
- Electronic condensate monitoring
- Calibration certificate
- Wireless data interface (e.g. for connection to a smartphone
- or tablet)

Dimensions (W x H x D) 500 x 650 x 250 mm
(Device and heared sysrem on trolley)
Weight app. 23 kg (in aluminum-framed transport case)

RADIO REMOTE CONTROL (INCLUDED IN DELIVERY)

- Wide coverage for bridging distances between the measuring point (exhaust opening) and setting point (e.g. burner, switch cabinet etc.)
- Includes thermocouple, mini-USB connection (data transfer to laptop/ PC), SD card slot
- Foil keypad with high-quality TFT color display
- Display, printing and storage of measurement data
- Full instrument operation (including manual CO shut off, starting and terminating measurements, data processing, ...)
- Reliable data transfer via radio (best-possible prevention of interferences, bypassing of metal or concrete obstacles, automatic connection establishment, no abrupt disruption of connection with maintenance of all measuring data, as well as automatic connection and re-establishment of a radio connection)

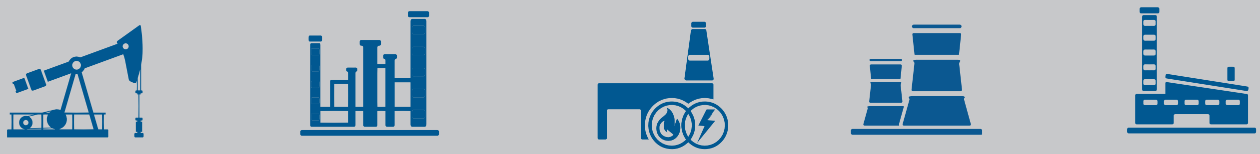
Measureable Gases

O_2	CO	C_xH_y	NO_2	SO_2	NO	
NO	NO_2	SO_2	H_2S	H_2	CO%	
CO_2	C_xH_y	CO%	SO_2	NO	NO_x	NO_2

● = Base; ● = Optional EC; ● = Optional NDIR; ● = Optional Pellistor; ● = Optional CLD/PAS; ● = Optional NDUV

ACCURATE ROBUST EFFICIENT SAFE

Testing according to DIN EN 50379-2 and 1st. BImSchV.



FOR NEARLY CONTINUOUS MEASUREMENTS (UP TO 72 HOURS)

- Free combination of needed gas sensors (O_2 sensor = scope of delivery)
- Equipped for continuous measurement > 72 hours on systems with programmable measuring intervals
- Integrated thermal quick-printer
- Inner heating and ventilation cooling as required by real operational environment (0-40°C ambient temperature)
- Wide range of data processing capabilites
- Stainless steel gas cooler for perfect, dry gas preparation
- Electronic condensate monitoring and automatic condensate evacuation
- Additional display at the basic unit for fast reading of status and warning messages
- Basic unit build in ultralight robust aluminium housing
- T-room stick/ T-room probe
- Stored in spacious aluminium-framed transport case with optional trolley for easied mobility of the complete system
- Including all needed filters, printer paper etc; all consumables and filters can be easily replaced by the user

HEATED SAMPLING SYSTEM

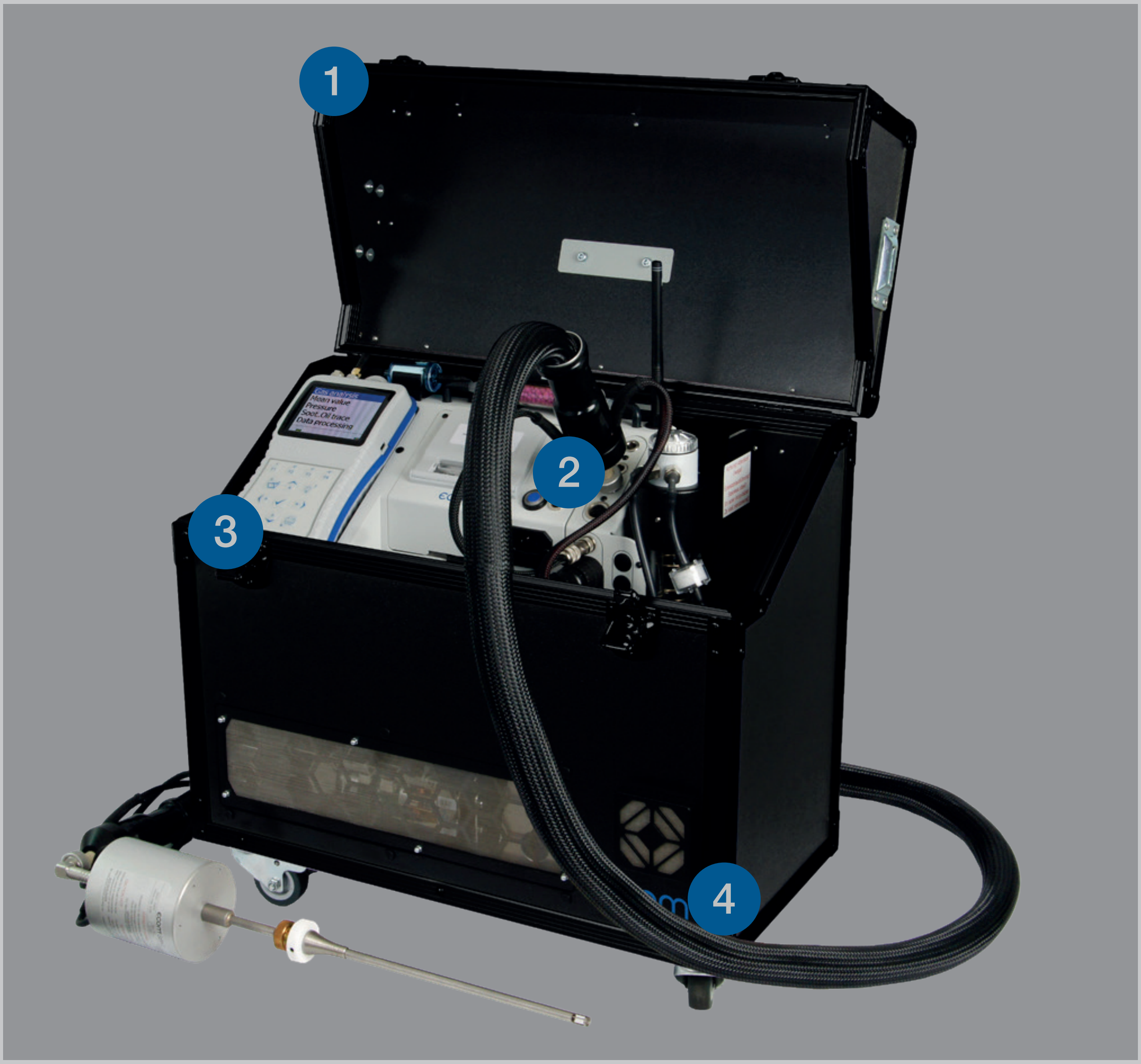
- Heated probe with integrated PTFE filter and thermocouple for flue gas temperature measurement
- Heated tubing for loss-free transport of sampled gas (adjustable temperature)
- Incl. aluminium-framed transport case - perfect integration in the ecom-J2KNpro TECH transport system

ACCESSORIES

- Different filter options - including for intensive solid fuel measurement
- Various temperature feeler gauges (contact sensor, surface sensor,...) for differential temperature measurements (e.g. flow temperature and return temperature)
- Trolley for easy transport

FAR-REACHING COMPLETE COOL LOSS-FREE

System construction J2KNpro TECH



1

ROBUST
TRANSPORT CASE

3

FAR-REACHING
RADIO REMOTE CONTROL

2

HIGH PERFORMANCE
HEATED SAMPLING SYSTEM

4

RELIABLE
HEATED TUBING

ACCURATE ROBUST EFFICIENT SAFE

1

MODULAR
TRANSPORT CASE SYSTEM

3

PROVEN
ECOM-QUALITY

2

EASY DOCKING
TROLLEY SYSTEM

4

SLIDING MOTION
WHEELS WITH PARKING BREAK

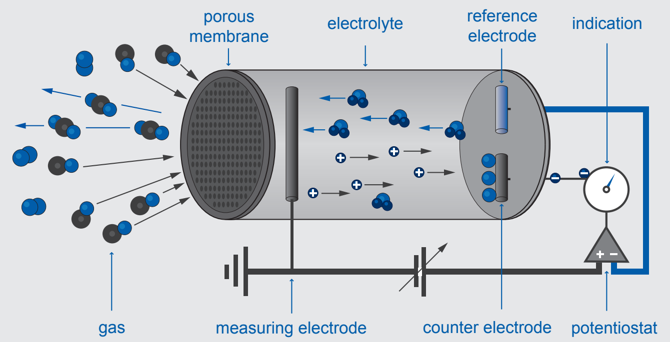
FAR-REACHING

COMPLETE

COOL

LOSS-FREE

Measuring methods of J2KNpro TECH in detail



Electrochemical Measurement (EC)

The principle of an electrochemical sensor is to have at least two electrodes (sensing and counter electrode) which are in contact with each other in two ways:

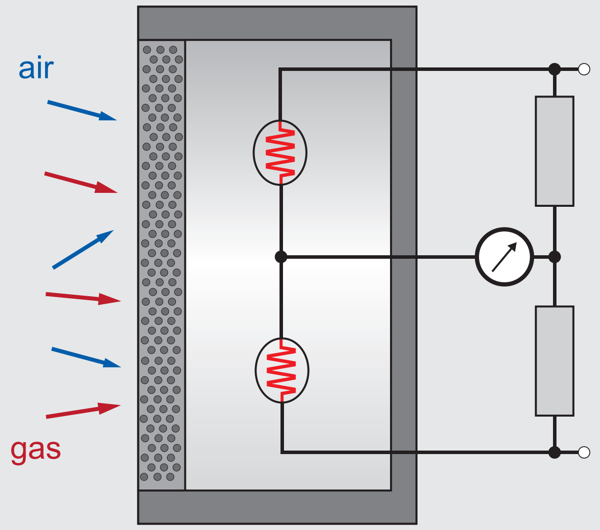
1.) via an electrically conductive medium (electrolyte, i.e. liquid as an ion conductor)

2.) via an external electric circuit (electron conductor).

The electrodes are made of a special material which is adapted to a special gas. They have a catalytic effect so that certain chemical reactions take place where gas, catalyst and electrolyte meet together.

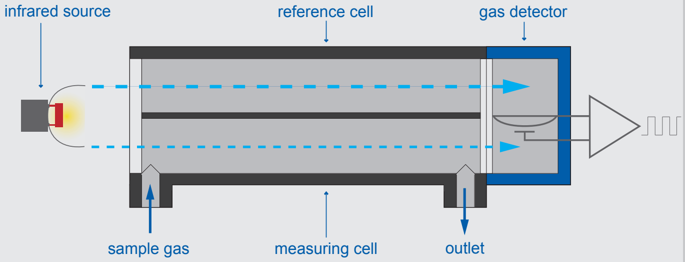
A two-electrode sensor is relatively cheap but has some disadvantages, especially by higher gas concentrations. This can lead to unusable measurement signals.

Therefore a third electrode is added to the sensor, the so-called reference electrode. It is not flown through by current and has a stable potential. The voltage of the measuring electrode to the counter electrode is constantly compared with the voltage of the reference electrode, so that corrections can be applied. This results in an improved measurement quality (e.g., in terms of linearity and selectivity) and a longer lifetime.



Combustible gas sensor (PEL)

Two platinum spirals are each embedded in a ceramic layer and electrically connected via a bridge switch. The surface of the one platinum spiral is activated by a catalyst which boosts oxidation – the other platinum spiral is inactivated. Current flows thru the spirals and heats them up to approx. 500°C. The air oxygen reacts with the flammable gas on the surface of the active spiral. As a result, temperature and resistance increase in the active platinum spiral. The bridge gets out of balance and is hereby a measure for the presence of flammable substances.



Non dispersive Infra-red Sensor (NDIR)

NDIR sensors analysers are particularly suitable for the determination of the concentration of carbon monoxide, carbon dioxide or hydrocarbons in a gas.

The main components are:

- a source of infrared radiation
- a tube (cuvette) irridated with the gas to be analysed
- a wavelength filter
- an infrared detector – the recipient for the infrared rays

The infrared light irradiates the gas in the measuring cell and is partly absorbed by the molecules of the gas to be analysed. Subsequently the rest of the infrared light irradiates the wavelength filter and meets with the infrared detector.

Ideally only the gas to be measured should absorb the light of the corresponding wavelength. But since a gas mixture contains several gases, absorption areas can overlay, raising a crosssensitivity. This must either be compensated –in order not to falsify the measurement resultsor be avoided by a skilful selection of the frequency bands.

With NDIR sensors over 100 different gases can be detected from ppm to percentage range. In many fields of application they are the default method because the measurement method is non-contact and free of consumption.

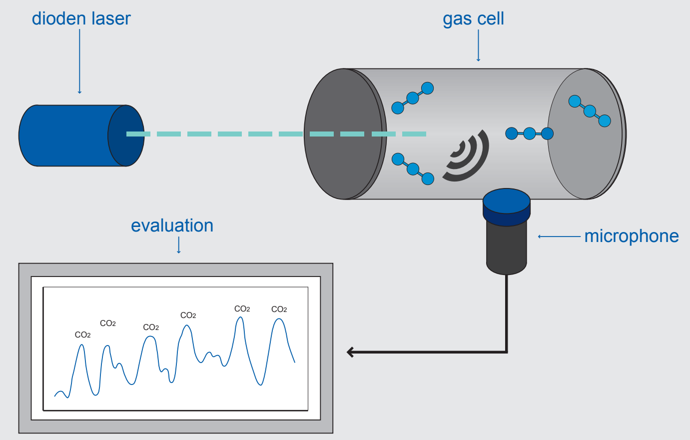
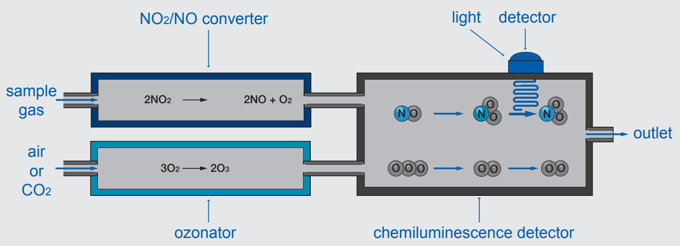


Photo-Acoustic Spectroscopy (PAS)

The photoacoustic spectroscopy (PAS) is a spectroscopic method which utilises the photoaacoustic effect. For example, gas, irradiated with modulated light of a predefined wavelength. A certain part of light energy is absorbed by the sample and is converted into acoustic waves. These signals can be detected by a microphone and then evaluated. Gas molecules absorb a portion of light when the light frequency corresponds with an absorption band of the gas in the cell. The higher the concentration of the gas, the more light is absorbed.

As a light source, infrared laser diodes are frequently used, because the specific wavelength (color) of the investigated material is in the infrared range in many applications. The light is modulated in an electronic or mechanical way, for example with a chopper.

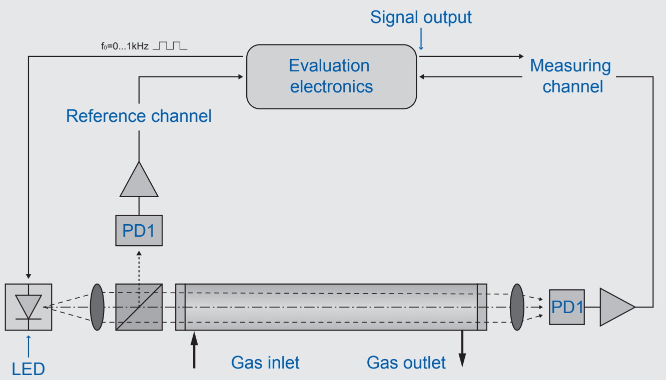


Chemiluminescence (CLD)

Chemiluminescence means light which is emitted by excitation of a chemical reaction. A molecule can pass from the electronic initial condition to an electronic excited condition by absorption of energy. During the transition, the absorbed energy can be emitted again to an energetically lower-lying condition. On the one hand it can happen in form of heat (non-radiative deactivation) and, secondly, by the emission of light (luminescence). This phenomenon is used in the analysis of nitrogen gases.

Nitrogen monoxide (NO) reacts with ozone (O_3) to excited nitrogen dioxide (NO_2). The emitted light is amplified and measured by a photomultiplier.

When all nitrogen oxides are to be measured in a sample gas stream, then the NO content is to be measured first. This occurs without catalyst. Subsequently, a gas stream is directed to the catalyst, NO_2 is reduced to NO and the sum NO + NO_2 (= NO_x) is determined.



Non dispersive Ultraviolet sensor (NDUV)

The NDUV measurement principle bases on the selective absorption of ultraviolet radiation in a range from 200 nm to 450 nm. Numerous important gases like sulphur dioxide (SO_2), nitrogen dioxide (NO_2), nitrogen monoxide (NO) aromatic hydrocarbons (e.g. benzene) and ozone (O_3) can be measured within this spectral range. This kind of gas analysis is not influenced by disturbing steam concentrations. The radiation source is a special LED (light emitting diode). Using the AlGaN LED technology enables to consistently cover spectral ranges from 360 nm to 230 nm. The absorption of the radiation in the sample cell bases on the Lambert-Beer law.

The physical construction consists of a photometer with two receiving detectors. The reference detector controls continuously the radiation intensity of the UV LED a serves herewith to offsetting aging effect and temperature influences.

In the photometer, the radiation of the LED is reproduced with a UV lens so that a parallel radiation beam path forms. This radiation is split in a successional radiation beam splitter in a measuring and a reference paths. At the end of the measuring cuvette, the radiation is further conveyed by anpother UV lens to a high-sensitive UV detector which converts the radiation into a measuring voltage. The radiation absorption in the cuvette is then a measure for the gas concentration.

HEADQUARTER

ecom GmbH
Am Grossen Teich 2
58640 Iserlohn
GERMANY

www.ecom.de

ECOM AMERICA Ltd.
1628 Oakbrook Drive
30507 Gainesville, Georgia
USA

www.ecomusa.com

Ecom SAS
5, rue de Lisbonne
67300 Schiltigheim
FRANCE

www.ecom.fr

ecom (Beijing) Co., Ltd.
Unit 05 room 301
3rd floor building 2
courtyard 9 Jiuxianqiao East Road
Chaoyang District, Beijing
CHINA

www.ecomchina.com.cn

Partner

Find your international partner on

www.ecom.de/en/kontakt/