ADOS
est. 1900

Instrumentation and Control

HYDROCARBON ANALYSER

KM 2000 CnHm EM

ADOS GmbH
Instrumentation and Control
P.O. Box 500 444 · 52088 Aachen · FRG
Trierer Strasse 23 – 25 · 52078 Aachen · FRG

Tel: +49 (0) 2 41 / 97 69 - 0
Fax: +49 (0) 2 41 / 97 69 -16
info@ados.de
www.ados.de

since 1997
DIN EN ISO 9001
ID: 01 100 71011

HYDROCARBON ANALYSER KM 2000 CnHm EM

ADOS est. 1900

Application

The modular constructed ADOS KM 2000 CnHm EM equipment incorporates a microcontroller-aided measurement device for measuring solvents.
All combustible gaseous CnHm compounds can be measured with the exeption of chlorinated and sulphur-sublimed hydrocarbons.
The thermocouples used for measurements, in conjunction with applying the principle of heat reaction, offer the following advantages:

- High degree of sensitivity
- Good accuracy
- Negligible drift of zero point
- Over-range signals have no effect

Fields of Application

Supervision of industrial processes

- KM 2000 CnHm EM:
  Measuring the emission of hydrocarbons, according to the German clean-air regulations
- KM 2000 CnHm:
  Measuring solvent saturation
  Measuring the concentration of solvents

Room air (ventilation) monitoring

A warning is issued at a very low concentration of poisonous gas thus preventing any danger to health.

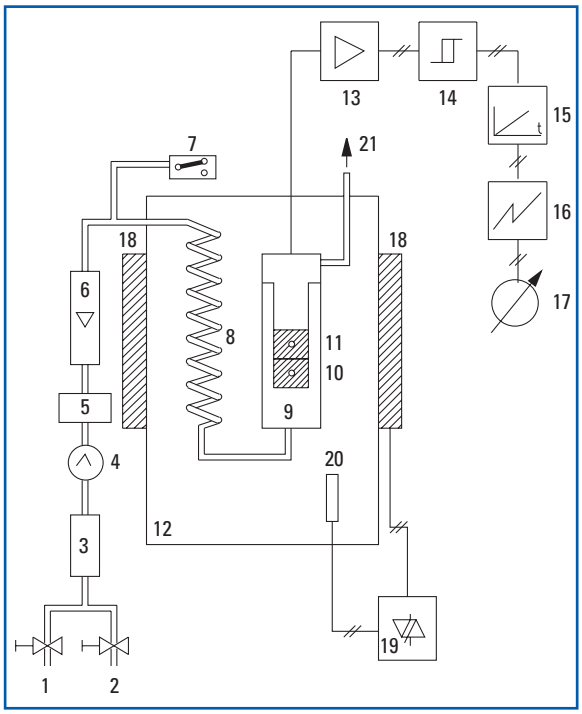
Measurement Principle and Functioning

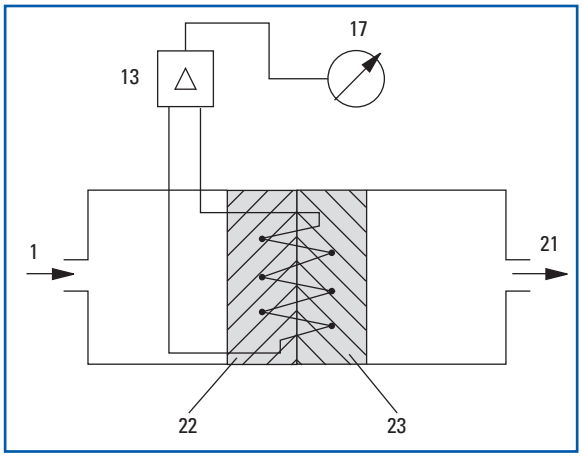
Gas measurement system

The sampled gas is drawn in by a pump through a feed pipe (heated if required), to the reaction chamber, via a Compensating filter, Flow regulator and Flow-through meter. The gas is warmed to a constant temperature by means of the heater coil and jacket and finally burned in a solid-matter catalytic converter. The difference in temperature before and after combustion, is used as the measurement signal that is prepared and evaluated by the microcontroller-aided analyser.

HYDROCARBON ANALYSER

KM 2000 CnHm EM





Gas Flow Schematic

1 = Sampled gas intake
2 = Test gas intake
3 = Prefilter or compensating filter
4 = Sampled gas pump
5 = Flow regulator
6 = Flow-through meter
7 = Flow monitor
8 = Heating coil
9 = Catalyst chamber
10 = Reference measuring point
11 = Measuring point
12 = Reaction chamber
13 = Measuring amplifier
14 = Limit monitor 1–4
15 = Measured value integration
16 = Continuous-line recorder
17 = Concentration indicator
18 = Heater
19 = Temperature control
20 = Resistance-thermometer
21 = Gas outlet
22 = Inert mass
23 = Catalytic converter

Analyser

The analyser functions on the principle of heat reaction. The difference in temperatures at the reference measuring point and the measuring point, is a directly-dependent variable of the component part of combustible substances in the gas.
The reference measuring point is subjected to the heated non-burned gas mixture, whilst the second probe of the thermocouple pile measures the temperature of the burned gas.
A load-independent current of 0–(4)–20 mA is available for connecting to electrical test meters, plotters and limit value monitors. An RS 232 interface is incorporated for data communication.
The inclusion of a measured value integration provides the facility of forming the average value of measured quantities, continuously or over a prescribed period of time.

Equipment construction

The hydrocarbon measuring system ADOS KM 2000 CnHm EM consists of the following 19" rack units:

- Reaction chamber with sensor and electronics
- Gas suction system with or without constant heating for the feed pipes, with sampled gas pump, flow-through meter, flow regulator, flow monitor and filter
- Microcontroller-aided evaluation unit in 19"-system with application specific standard plug-in Euro-cards
- The housing

HYDROCARBON ANALYSER KM 2000 CnHm EM

ADOS est. 1900

Technical data

Measurement principle:	Measuring the heat of combustion in a catalytic converter
Measuring ranges:	0–50 mg/m³ TOC up to 0–1600 mg/m³ TOC
Minimum detection limit:	1 mg/m³ TOC
Cross sensitivity: (50 mg/m³ measuring range)	
concentration:	max. deviation:
200 mg/m³ SO_2	-10 %
30 mg/m³ NO_2	-2,5 %
300 mg/m³ CO	+108 %
300 mg/m³ NO	+7 %
Output signals:	Current interface 0–(4)–20 mA max. load 400 ohm; RS 232
Response time (t_{90}):	< 200 sec. (sampling pipe approx. 11 m; dead time 10 sec.)
Accuracy:	< 2 % full-scale error
Permissible ambient temperature:	+5 °C to +40 °C
Temperature dependency:	< 5 % full-scale error
Sampled gas flow:	125 l/h (±10 l/h)
Preheating time:	approx. 120 min.
Maintenance interval:	4 weeks with auto-calibration 1 week without auto-calibration
Mains supply:	230 V/50 Hz; 115 V/60 Hz; 600 VA
Dimensions (W x H x D):	600 x 478 x 500 mm
Weight:	approx. 43 kg
Test certificate:	TÜV approval according to the clean-air regulations („TA-Luft“). TÜV-report: 936/21 200 245

Accessories

- CnHm EM sampling probes heated or unheated
- Mounting flanges for removal of heated extraction pipes
- Heated extraction pipes
- Test gas bottles with pressure reducer
- Polution control computer according to the clean-air regulation
- Continuous-line recorder
- Air purging system
- Compensation of CO cross sensitivity
- Automatic calibration system

Note: tested and approved according to the guidelines of the Clean Air Act in 2002, meets the requirements of QAL 1 according to DIN EN14181

ADOS GmbH
Instrumentation
and Control