



# KM 2000 CnHm EM



## Instrumentation and Control

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### 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 exception 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

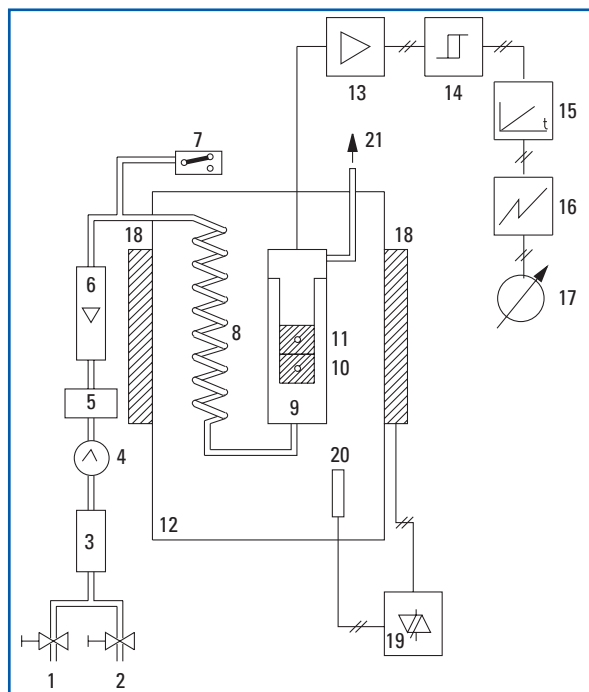
#### Room air (ventilation) monitoring

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

### Measurement Principle and Functioning

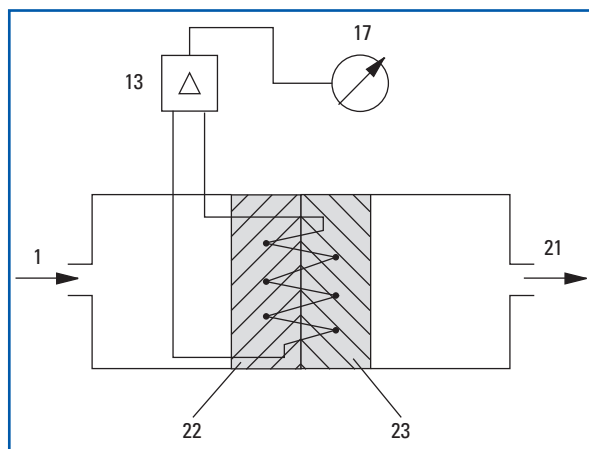
#### Gas measurement system

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.



## Gas Flow Schematic

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

### Technical data

Measurement principle:	Measuring the heat of combustion in a catalytic converter
Measuring ranges:	0–50 mg/m <sup>3</sup> TOC up to 0–1600 mg/m <sup>3</sup> TOC
Minimum detection limit:	1 mg/m <sup>3</sup> TOC
<b>Cross sensitivity:</b> (50 mg/m <sup>3</sup> measuring range)	
concentration:	max. deviation:
200 mg/m <sup>3</sup> SO <sub>2</sub>	-10 %
30 mg/m <sup>3</sup> NO <sub>2</sub>	-2,5 %
300 mg/m <sup>3</sup> CO	+108 %
300 mg/m <sup>3</sup> NO	+7 %
Output signals:	Current interface 0–(4)–20 mA max. load 400 ohm; RS 232
Response time (t <sub>90</sub> ):	< 200 sec. (sampling pipe approx. 36.09 ft; dead time 10 sec.)
Accuracy:	< 2 % full-scale error
Permissible ambient temperature:	+41 °F to +104 °F
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:	115 V/60 Hz; 230 V/50 Hz; 600 VA
Dimensions (W x H x D):	23.6 x 18.8 x 19.7 inch
Weight:	approx. 94.79 lbs
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
- Pollution 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