CMS - 7

Continuous Measuring System

Properties

Measurement of gas concentrations

- Gases measured with NDIR sensors (max 3 sensors): CO2, CH4, CO
- Gas measured with partial pressure sensor: O2
- Gases measured with electrochemical sensors (max. 8 sensors): CO, NO, NO2, SO2, H2, H2S. Other gases on request

Measurement of other values

- Gas and ambient temperatures
- Positive, negative and differential pressure with 1 Pa resolution
- Atmospheric pressure (800...1200 hPa)

Calculations

- CO2 concentration
- Calculation of all relevant combustion parameters

Display of Results

- All measured and calculated values can be shown on the display as current or average values
- Averaging of all measured values. Averaging times: 2, 10, 20, 30, 60, 120 and 180 seconds
- Display of all values as graphs
- Data logger on MMC card
- –Complete PC software for data processing and on-line communication
- Voltage outputs: 8 channels 0...10 V
- Current outputs: 8 channels 0/4...20 mA

Software Features

- International compatibility (language, date format, units etc.)
- Automatic zeroing after switching on.
- Calibration of O2/CO2 possible during measurement
- All parameters can be programmed
- Complete list of 22 fuels
- Further fuels can be programmed by user
- Automatic permanent check of instrument in the "control list". Acoustic and optical warning
- Cross-sensitivity and temperature drift of sensors compensated automatically

Hardware Features

- Peltier gas conditioner with condensate pump
- Integrated clock/calendar
- Large LCD display with backlighting
- Gas probe with thermocouple
- Heated inlet filter
- Heated gas hose
- PC interface RS 232 C

Possible uses

- Biogas plants
- Landfills
- Greenhouses
- Stationary control of combustion systems
- Incinerators
- Safety such as CO2 (0...2000 ppm) or CH4 (0...5 %)

The stationary gas analyser CMS-7 is installed in a robust metal housing with a lockable transparent door. It can be either wall-mounted or stand on a table. The instrument consists of three separate panels: power supply, Peltier gas conditioner and analyser.
The sample gas is transported over a heated hose with integrated heated filter to the analyser.
The measurement results can be read directly from the integrated screen, transported to a PC over RS232C or placed on the standard analogue current/voltage outputs.

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DMS - 7

Component	Method	Range	Resolution	Detection Level	Accuracy	Time (T90)
NDIR sensors						
CO – Carbon monoxide-Volume concentration	IR Sensor	0…100 %	0.10 %	0.10 %	+/- 3 % rel., or 0.5 % abs.	45 s
		0….50 %	0.10 %	0.10 %	+/- 3 % rel., or 0.3 % abs.	
CO_2 – Carbon dioxide-Volume concentration		0…25 %	0.01 % (100 ppm)	0.01 % (100 ppm)	+/- 3 % rel., or 0.15 % abs.	
		0…1 0%	0.01 % (100 ppm)	0.01 % (100 ppm)	+/- 3 % rel., or 0.05 % abs.	
CH_4 – Methane-Volume concentration		0…5 %	0.01 % (100 ppm)	0.01 % (100ppm)	+/- 3 % rel., or 0.03 % abs.	
		0…2.5 %	0.001 % (10 ppm)	0.001 % (10 ppm)	+/- 3 % rel., or 0.015 % abs.	
N_2O – Nitrous oxide –Volume concentration		0…500 ppm	1 ppm	1 ppm	+/- 3 % rel., or 5 ppm abs.	
Electrochemical sensors						
CO - Carbon monoxide, Volume concentration	Electrochemical sensors	0...20000 ppm	1 ppm	1 ppm	+/- 5 % of measured value, at least 5 ppm abs.	45 sec.
NO / NOx - Nitric oxide, Volume concentration		0...5000 ppm	1 ppm	1 ppm		
NO_2 - Nitrogen dioxide, Volume concentration		0...1000 ppm	1 ppm	1 ppm		
SO_2 - Sulphur dioxide, Volume concentration		0...5000 ppm	1 ppm	1 ppm		
H_2S - Hydrogen sulphide, Volume concentration		0...1000 ppm	1 ppm	1 ppm		
H_2 - Hydrogen, Volume concentration		0...2000 ppm	1 ppm	1 ppm		
Partial pressure sensor						
O_2 - Oxygen, Volume concentration	partial pressure sensor	0...25 %	0.01 %	0.01 %	+/- 5 % rel., or 0.2 % abs.	45 sec.
Measured temperatures						
Tgas – Temperature of the flue gases	Thermocouple	-20..2000°C	1°C	1°C	+/- 1.5 % rel., or ± 2 °C	30 s
Tamb – Ambient temperature	Thermistor	-20..100°C	0.1°C	0.1°C	± 1 °C	30 s
Further values						
Atmospheric pressure	DMS bridge	800...1200 hPa	1 hPa	1 hPa	± 10 hPa	10 s
Pressure/draught	DMS bridge	-25...0...+25 hPa	0.1 or 1 Pa as set	0.1 or 1 Pa as set	+/- 5 % rel., or 2 Pa	10 s
Diff. pressure	DMS bridge	-20...0...+20 hPa	0.1 or 1Pa as set	0.1 or 1Pa as set	+/- 5 % rel., or 2 Pa	10 s
V – Flow velocity	Pitot tube	1...30 m/s	0.1 m/s	0.1 m/s	+/- 2 % rel., or 0.5 m/s	10 s
Calculated combustion parameters						
TI (CO/CO2-Toxic Index)	Calculated	0...1 %	0.01 %	0.01 %	0.01 %	10 s
Lambda – Excess air	Calculated	1..10	0.01	0.01	0.01	10 s
qA – Combustion loss	Calculated	0..100 %	0.1 %	0.1 %	0.1 %	10 s
Eta -Efficiency	Calculated	0..100 %	0.1 %	0.1 %	0.1 %	10 s

Parameter	Description
Size	W x L x H: 600 x 635 x 516 mm
Weight without probe	48 kg
Display size	Graphic LCD with backlighting. Contrast set by user, 320 x 240 pixels
Data logger	MMC 256 MB
Interface	RS232C
Supply	Mains 230 VAC 50 ÷ 60Hz
Gas pump	Membrane pump, set to 90 l/h
condensate pump	peristaltic pump, electronically controlled
Probe length	300mm (other lengths available)
Sample hose	Heated hose, 3 m
Gas filter	Heated filter 20 µm
Analogue outputs / Voltage	8 channels : 0…10 V
Analogue outputs / Current	8 channels: 0/4…20 mA
Operating temperature	10°C ÷ 40°C
Storage temperature	-20 °C ÷ +55 °C
Ambient humidity	5 - 90 %, non-condensing

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