



## Hand-held Flue Gas Analyser

### Standard and optional configuration

#### Measurement of gas concentrations

- Standard version with two gas sensors: O<sub>2</sub>, CO
- Two further optional sensors from: NO, NO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S. NO required as third sensor
- CO ambient measurement with a resolution of 0.1 ppm

#### Measurement of other parameters

- Measurement of gas and ambient temperatures
- Pressure or draft pressure measurements with 0.1 Pa resolution
- Relative humidity measurement probe - optional
- Soot/smoke test according to the Bacharach method - electronically regulated to 1.63 l

#### Calculation

- CO<sub>2</sub> concentration
- Calculation of all relevant combustion parameters

#### Processing and presentation of measuring data

- All results shown on display
- Averaging of all measured values. Averaging time: 2, 10, 20, 30, 60, 120, 180 seconds
- Graphical presentation of all measured values as diagram
- Storage for 32 measurements - "measure now, print later"
- Powerful PC program for analyzer settings and data communication

#### Software capabilities

- Automatic zeroing when the analyser is switched on
- All settings for the flue gas analyzer carried out with PC programm
- List of 6 common fuels (from DIN or OENORM)
- 4 further freely programmable fuels
- Permanent automatic check of the instrument with acoustic warning and full information in the "control list"

#### Hardware capabilities

- Integrated clock/calendar
- IR interface for external printer
- Incredible 75 hours operating time from one set of batteries
- Full graphic display LCD 66 x 36 mm
- Gas probe with thermocouple and condensate trap
- Power supply for heated probe holder (when powered from the mains)
- RS-232C interface and multifunctional PC program
- Updateable FLASH ROM program memory
- Simple, intuitive operation, like a mobile phone

#### Optional accessories

- differential pressure measurements with 0.1 Pa resolution
- Flow velocity measurement
- leather-look case for storage and rubber boot for protection of the instrument
- Magnetic plate to attach the instrument to steel surfaces
- External thermal printer with wireless IR communication

A further development from the tried and tested Sensonic 1200 hand-held flue gas analyzer. This new analyzer is equipped with the following extra features:

- Can be fitted with up to 4 electrochemical sensors.
- Suitable for a soot test using electronically controlled gas volume.
- Fitted with a powerful Li ion battery.
- Big memory capable of storing 32 measurement reports.
- Backlit graphic LCD
- Robust metal connectors

An attractive alternative to other, bigger analyzers. Manufactured according to the principles of EN50379.

### Operating data

Parameter	Description
Size	245 x 90/128 x 60 mm
Weight	0.7 kg
Probe	Heated, with condensate trap and filter
Probe length	300 mm
Length of gas line	2 m
In line filter	in-line, Filter 20 µm
Gas pump	Membrane pump
Display	LCD graphic display 36 x 66 mm
Power supply	mains adapter or internal rechargeable battery (24 hours)
Interface	- RS232C for external computer communication - IR connection for external printer
Zero calibration	automatic 120 sec. after switching on. Manual option
Clock/calendar	Integrated clock/calendar
Operating temperature	10 °C ÷ 50°C
Storage temperature	-20 °C ÷ +55 °C
Ambient humidity	5 - 90 %, non-condensing

# madur

# Sensonic 1400

Parameter	Method	Indication range	Display resolution	Accuracy	Detection limit	Response time (t90)
<b>Gases measured in standard configuration</b>						
O <sub>2</sub> - oxygen, volumetric concentration	electrochemical gas sensor	0...25 %	0.01%	0.2%	0.2%	45 s
CO <sub>2</sub> - carbon dioxide, volumetric concentration	calculated from volumetric concentration of O <sub>2</sub>	0..25 %	0.01%	0.2%	0.2%	45 s
CO – ambient carbon monoxide, volumetric concentration	electrochemical gas sensor	0...100 ppm	0.1 ppm	±1 ppm or 5 % rel.	1 ppm	45
CO - carbon monoxide, volumetric concentration	electrochemical gas sensor	0...20,000 ppm	0.1 or 1ppm as set	± 5 ppm or 5 % rel.	5 ppm	45 s
COmg - carbon monoxide, mass concentration	calculated from volumetric concentration of CO	0...	1mg/Nm <sup>3</sup>	± 10 mg/Nm <sup>3</sup> or 5 % rel.	10mg/Nm <sup>3</sup>	45 s
COrel - carbon monoxide, mass concentration relative to O <sub>2</sub>	calculated from volumetric concentration of CO and O <sub>2</sub>	0...	1mg/Nm <sup>3</sup>	± 10 mg/Nm <sup>3</sup> or 5 % rel.	10mg/Nm <sup>3</sup>	45 s
<b>Gases measured with optional electrochemical sensors</b>						
CO - carbon monoxide, volumetric concentration	electrochemical gas sensor	0...20.000ppm	1 ppm	± 5 ppm or 5 % rel.	5 ppm	45 s
CO - carbon monoxide, volumetric concentration	electrochemical gas sensor	0...10 %	0.01 %	± 0.05 % or 5 % rel.	0.01 %	45 s
NO - volumetric concentration of nitric oxide	electrochemical gas sensor	0..1000 ppm	1 ppm	±5 ppm or 5 % rel.	5 ppm	45 s
NOmg - mass concentration of nitric oxide	calculated from volumetric concentration of NO	0...	1 mg/Nm <sup>3</sup>	±10 mg/Nm <sup>3</sup> or 5 % rel.	3 mg/Nm <sup>3</sup>	45 s
NOrel - mass concentration of nitric oxide relative to O <sub>2</sub>	calculated from volumetric concentration of NO and O <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±10 mg/Nm <sup>3</sup> or 5 % rel.	3 mg/Nm <sup>3</sup>	45 s
NO <sub>2</sub> - volumetric concentration of nitrogen dioxide.	electrochemical gas sensor	0...500 ppm	1 ppm	±5 ppm or 5 % rel.	5 ppm	45 s
NO <sub>2</sub> mg - mass concentration of nitrogen dioxide	calculated from volumetric concentration of NO <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
NO <sub>2</sub> rel - mass concentration of nitrogen dioxide relative to O <sub>2</sub>	calculated from volumetric concentration of NO <sub>2</sub> and O <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
SO <sub>2</sub> - volumetric concentration of sulfur dioxide	electrochemical gas sensor	0...2000 ppm	1 ppm	±5 ppm or 5 % rel.	5 ppm	45 s
SO <sub>2</sub> mg - mass concentration of sulfur dioxide	calculated from volumetric concentration of SO <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
SO <sub>2</sub> rel - mass concentration of sulfur dioxide relative to O <sub>2</sub>	calculated from volumetric concentration of SO <sub>2</sub> and O <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
H <sub>2</sub> S - volumetric concentration of hydrogen sulfide	electrochemical gas sensor	0...500 ppm	1 ppm	±5 ppm or 5 % rel.	5 ppm	45 s
H <sub>2</sub> Smg - mass concentration of hydrogen sulfide	calculated from volumetric concentration of H <sub>2</sub> S	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
H <sub>2</sub> Srel - mass concentration of hydrogen sulfide relative to O <sub>2</sub>	calculated from volumetric concentration of H <sub>2</sub> S and O <sub>2</sub>	0...	1 mg/Nm <sup>3</sup>	±15 mg/Nm <sup>3</sup> or 5 % rel.	15 mg/Nm <sup>3</sup>	45 s
<b>Other measured values</b>						
T <sub>gas</sub> - flue gas temperature	Thermocouple	-10..1000°C	0.1 or 1°C set by user	±2 °C or 1.5 % rel.	1 °C	30 s
T <sub>amb</sub> - ambient temperature	Thermistor	-10..100°C	0.1 or 1°C set by user	± 1 °C	1 °C	30 s
Pressure	DMS bridge	-25 hPa ... +25 hPa	0.1 or 1 Pa set by user	±2 Pa or 5 % rel.	1 Pa	10 s
Diff. Pressure	DMS bridge	-25 hPa ... +25 hPa	0.1 or 1 Pa set by user	±2 Pa or 1 % rel.	1 Pa	10 s
V - flow velocity	Pitot tube	1..30 m/s	0.1 m/s	0.5 m/s or 2 % rel.	1 m/s	10 s
rH - relative humidity	capacitive sensor	5..95 %	0.01 %	2 % rH or 2 % rel.	5 %	10 s
Soot/smoke test	Bacharach method	0..9	0.5	0.5	0.5	
TI (CO/CO <sub>2</sub> -Toxic Index)	calculated	0...0.01	0.0001	5 % rel.	0	45 s
Lambda - excess air number	calculated	1..10	0.01	2 % rel.	0	45 s
qA - combustion losses	calculated	0..100 %	0.1 %	2 % rel.	0 %	45 s
Eta - efficiency	calculated	0..120 %	0.1 %	2 % rel.	0 %	45 s