



IMR3000

The compact flue gas analyser for industrial applications

PRODUCT ADVANTAGES FROM A-Z

- **Analogue signal port**
For 8 channels simultaneously, 0...10 V (4...20mA).
- **Battery**
Rechargeable lead acid battery with built in battery charger guarantees 6 hours of independence from main power. The battery is protected against over charging.
- **Case**
Built-in a robust, protective case.
- **Draft/Pressure measurement**
Integrated measurement of the draft/pressure in the flue, built-in differential pressure measurement in combination with the option for flue gas volume/flue gas velocity.
- **Dust filter**
Particle filter 4 µ.
- **Flue gas probe**
Gas extraction probes with K-type thermocouple, heat insulated handle, stainless steel fixture cone. Standard length 300 mm, other lengths on request. PtRh-Pt-probe (gas temperature up to 1550 °C) on request.
- **Flue gas velocity/Flue gas volume**
Continuous measurement, displayed on the TFT-Display during the flue gas measurement.
- **Fuel types (pre-programmed)**
18 pre-programmed standard fuels, with the corresponding calculation factors, incl. O₂-ref. values. Pre-programmed fuel factors can be corrected by the operator. 4 fuels programmable.
- **Gas conditioning**
Integrated condensate trap and inline dustfilter for standard applications.
- **Gas temperature**
NiCr-Ni (K-type) for continuous operation at 800 °C (1472 °F), allows short periods of 1200 °C (2192 °F)
PtRh-Pt (S-type) for continuous operation at 1550 °C (2732 °F)*.
- **Interface**
RS 232 C serial interface.
- **Memory**
Integrated automatic memory, documentation as print-out, mean value or external via RS 232 C interface.
- **TFT-Display**
5"-TFT-Display, displays all parameters simultaneously. Display of readings in ppm, mg or mg (O₂), mg/Btu.
- **Pitot tube**
Pitot tubes for flue gas velocity measurement are available in various lengths.
- **Power supply**
230 V/50 Hz or 110 V/60 Hz mains power supply, 12 V from the built-in battery.
- **Printer**
Integrated thermo printer for protocol.
- **Probe tubing**
Standard length 3.5 m. Extensions are available.
- **Protocol**
Printout with date and time. Automatic interval can be programmed.
- **Service software**
Integrated service software, information such as operation time, battery capacity, sensor self-check, system-failures are displayed automatically on the monitor.
- **TabGraph***
Windows software for data management on PC. Graphic-, tabular- and bar graph documentation of all measuring data.
- **Zero calibration**
Automatic zero calibration with ambient air on every start of the system, optical and acoustical signal after finishing of calibration (3 min.).



THE BASICS

The use of flue gas analyzers in industrial applications has become more and more common over the past years.

The use of new furnace technologies can reduce the consumption of precious fuel but makes maintenance and supervision of the plants more and more complicated. Portable flue gas analyzers can be helpful tools to reduce emissions and increase the efficiency. At the end the investment of a flue gas analyzer is repayed after a short time.

THE APPLICATION

The IMR3000 is a complete portable flue gas analysis system for industrial applications.

Up to 6 gases can be measured simultaneously. Due to the physical dimensions of the analyzer, it can be used even in hard-to-access areas.

The most common applications are:

- Emission analysis
- Furnace optimization
- Environmental monitoring
- Service revision i. e. in power stations

THE PERFORMANCE DATA

Gentics is using electrochemical sensors for the gas components O₂, CO, NO, NO₂, SO₂ and H₂S. For the gases CO₂ and C_xH_y, NDIR (non dispersive infrared absorption) sensors are used. Alternative Hydrocarbons can be measured with a Pellistor sensor within the range of the lower explosion limit (LEL) calibrated with methane.

The IMR3000 is a modular system and very easy to operate. All measured gas components are shown simultaneously on the integrated 5" TFT-display. Also indicated is the selected fuel type for calculation of the CO₂ content as well as ambient - and flue gas temperature (if CO₂ is measured with an infrared sensor, CO₂ calculated is not shown).

The oxygen content in the flue gas is necessary for calculation of variables such as excess air. The simultaneous measurement of the flue gas volume and velocity is available as option.

Measuring results can be printed on the built-in printer as standard protocol or mean value. Data can also be transferred over the RS232 serial interface or a 0...10 V (4...20 mA) analogue signal port.

THE SOLUTION

Available with the IMR3000 is a long list of options to customize an analyzer for a specific application. For wet stacks, cement kilns and other special applications, **Gentics** recommends the use of a gas conditioning system. In combination with the IMR600 gas conditioning system, the IMR3000 easily reaches accuracy levels usually achieved with CEM systems.

The flue gas analyzers of **Gentics** are worldwide in use and comply with current German environmental regulations and many national standards.

TECHNICAL DATA

VARIABLE	METHOD	SMALLEST MAESURING RANGE	LARGEST MEASURING RANGE	RESOLUTION	ACCURACY
O ₂ (Oxygen)	electrochem. sensor	0 ... 20,95 Vol.-%	0 ... 20,95 Vol.-%	0,01 Vol.-%	± 0,2%
CO (Carbon monoxide) H ₂ compensated	electrochem. sensor	0 ... 75 mg/m ³	0 ... 5 Vol.-%	< 100 mg/m ³ : 0,1 mg > 100 mg/m ³ : 1,0 mg	max. ± 3% of full scale
NO (Nitric oxide)		0 ... 200 mg/m ³	0 ... 5.000 mg/m ³		
NO ₂ (Nitric dioxide)*		0 ... 100 mg/m ³	0 ... 500 mg/m ³		
SO ₂ (Sulphur dioxide)*		0 ... 75 mg/m ³	0 ... 5.000 mg/m ³		
H ₂ S (Hydrogen sulfide)*		0 ... 60 mg/m ³	0 ... 300 mg/m ³		
H ₂ (Hydrogen)*	TCD	0 ... 20 Vol.-%	0 ... 100 Vol.-%	< 100 mg/m ³ : 0,1 mg > 100 mg/m ³ : 1,0 mg	± 5%
CxHy (Hydro carbons)*	Infrared sensor	0 ... 0,2 Vol.-%	0 ... 100 Vol.-%	0,1 Vol.-%	± 2%
CO ₂ (Carbon dioxide)*		0 ... 20 Vol.-%	0 ... 100 Vol.-%		
CO (Carbon monoxide)*		0 ... 20 Vol.-%	0 ... 100 Vol.-%		
CxHy (Hydro carbons)* (< LEL)	Pellistor sensor	0 ... 4,4 Vol.-% CH ₄		10 ppm	< 10%
°C (flue gas temperature)	Thermocouple	0 ... 500 °C	0 ... 1.605 °C	1 K	± 1 K



VARIABLE	METHOD	SMALLEST MEASURING RANGE	LARGEST MEASURING RANGE	RESOLUTION	ACCURACY
°C (Ambient temperature)	Semiconductor sensor	-20°...120 °C -4° ... 248 °F	-20°...120 °C -4° ... 248 °F	1 K	± 1 K
hPa Pressure/Draft	Semiconductor sensor	± 20 hPa (mm H ₂ O)	± 60 hPa (mm H ₂ O)	0,01	± 2%
CO ₂ (Carbon dioxide)**	calculated	0...CO _{2max} ***		0,1 Vol-%	± 0,2%
λ (Lambda)/excess air	calculated	1.00-9.99		0,01	± 2%
qA flue gas-losses	calculated	0...99,9%		0,01	± 0,5%
ETA efficiency	calculated	0...99,9%		0,01	± 0,5%
v (flue gas velocity/volume)*	Semiconductor sensor	0...5 m/s	0...25 m/s	0,01 m/s	± 2%
Soot spot determination*	Filter paper method according to DIN 51402	Volume-regulated suction pump 1,63 l/min ± 0,07 l/min			

The analyzer complies with EN 50379-2, TÜV registration N° By RgG 137

FURTHER TECHNICAL DATA

Weight	16 kg
Dimensions	510 x 430 x 180 mm (W x H x D)
Consistency	± 1% of full range
Linearity	± 1%
Drift (electro chemicalsensor)	< 5%/year
Response time/T90	< 40 sec
Operating temperature	+5 °C to +40 °C
Pump capacity	120 l/h
max. draft	-0,3 bar
max. pressure	1,2 bar
Storage temperature	-20 °C to +50 °C

* Option

** No CO₂ calculation, if CO₂ sensor is installed

*** selected fuel type



DIN EN 50379-2

