

## GM700 Laser Gas Analyzer

Measurement of gaseous components  
under difficult conditions  
In-situ and extractive technology



**SICK**  
Sensor Intelligence.

# GM700

## Sophisticated Gas Analysis "brought into line"

The GM700 series offers new possibilities to measure difficult and selective gas components such as HF, HCL or NH<sub>3</sub> with all-time flexibility – without the need of test gases. Using direct laser spectroscopy with a precisely adjusted spectral line the GM700 allows high-resolution measurements, free of cross-interference, drift and the necessity for any calibration.

### AREAS OF APPLICATION

- Emission monitoring in the fertilizer production, waste incineration, aluminium and ceramics industry
- NH<sub>3</sub> slip monitoring in DeNOx plants
- Glass industry
- Scrubber monitoring in the iron and steel industry
- Plastics processing
- Chemical and petrochemical industry
- Automotive applications

#### GM700 CROSS DUCT

- Representative results due to the measurement across the entire duct cross-section
- Main application for measurement of HF
- Drift- and calibration-free
- Particularly low maintenance

#### GM700 MEASURING PROBE

- Drift- and calibration-free
- One side duct access
- Easy installation
- Integrated zero point path
- Measurement performance independent from the channel dimensions

#### GME700 EXTRACTIVE

- Hot-wet analyzer
- Drift- and calibration-free
- Easy integration into existing extractive systems
- Applicable without limits using the appropriate gas conditioning (e. g. high pressures and temperatures)

### KEY FEATURES

- Broad field of applications due to the choice of extractive or in-situ analyzer design
- Precise and drift-free by the direct spectroscopy – no calibration with problematic test gases necessary, means high cost saving
- High selectivity due to very high spectral resolution – no cross-interference from other gases
- Fast response
- Applicable in harsh conditions
- Very low maintenance requirements and long servicing intervals

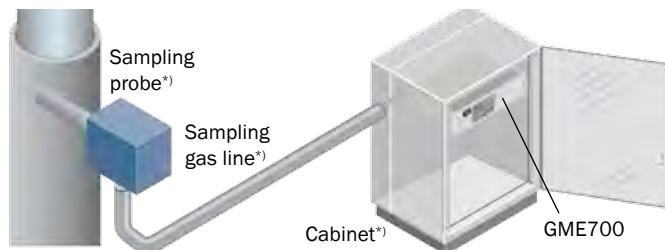
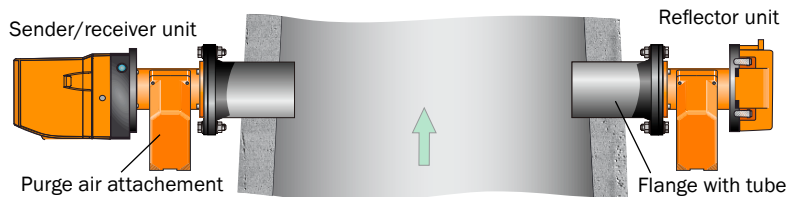
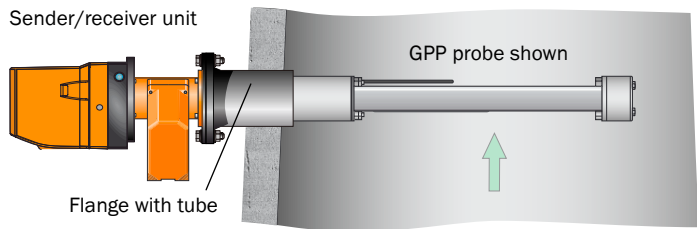




## SYSTEM COMPONENTS

The GM700 system offers the following models for best adaption to the measurement task:

- **GM700 model with measuring probe**
  - Sender/receiver unit with the optical and electronical modules
  - Probe as a version with an aperture (GMP) or as a gas diffusion probe (GPP)
  - AWE unit for processing, control and output of measuring data
- **GM700 cross duct model**
  - Sender/receiver unit with the optical and electronical modules
  - Reflector unit with triple reflector and a purge air attachment
  - AWE unit (see above)
- **GME700 extractive analyzer**
  - Compact 19" unit (4 HU) with integrated analyzer and evaluation unit as well as a heated cell



<sup>\*)</sup> Not covered by the standard scope of delivery

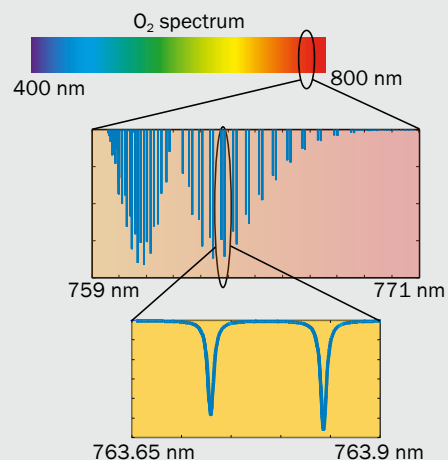
Optional components

- Purge air unit (for GMP probe and cross duct) for protection against contamination
- Weather proof covers
- Flanges with tube for mounting

## TUNABLE LASER DIODE SPECTROSCOPY (TDLS)

A laser beam is sent from the sender through the measuring gas onto the reflector, that aims the beam back to a highly sensitive photo diode in the sender/receiver unit. The laser diode wavelength is tuned to one absorption line of the measuring gas component. This line is scanned by modulating the wavelength, and then the transmission signal is recorded by the photo diode.

An appropriate signal evaluation delivers the size of the absorption line from which the gas concentration is calculated. The TDLS method allows therefore the selective measurement in a gas mixture. Measuring gas components of the GM700 are  $\text{NH}_3$ , HF, HCl and  $\text{O}_2$  for example.



Technical Data		GM700 series		
Model	<b>GM700</b> Probe model	<b>GM700</b> Cross duct model	<b>GME700</b> Extractive analyzer (19")	
Measuring Parameters				
Measuring principle	TDLS (Tunable Diode Laser Spectroscopy)			
Measuring component	NH <sub>3</sub> , HF, HCl, O <sub>2</sub>			
Available measuring range	Minimum measuring range <sup>1)</sup>	Maximum measuring range <sup>1)</sup>	Minimum measuring range <sup>2)</sup>	
NH <sub>3</sub>	0 ... 10 ppm	0 ... 5000 ppm	0 ... 5 ppm	
NH <sub>3</sub> /H <sub>2</sub> O	0 ... 5 vol%	0 ... 100 vol%	0 ... 2.5 vol%	
HF	0 ... 2 ppm	0 ... 2000 ppm	0 ... 1 ppm	
HCl	0 ... 10 ppm	0 ... 3000 ppm	0 ... 5 ppm	
HCl/H <sub>2</sub> O	0 ... 10 ppm/0 ... 50 vol%	0 ... 3000 ppm/0 ... 100 vol%	0 ... 5 ppm/0 ... 25 vol%	
O <sub>2</sub>	0 ... 3 vol%	0 ... 100 vol%	0 ... 1.5 vol%	
Accuracy	< 2 ... < 5 % of measuring value, dependent on the relevant application			
Measurement Conditions	Probe model	Cross duct model	Extractive analyzer	
Meas. gas temperature	-40 ... +430 °C	-40 ... +430 °C; higher on request	Heated cell up to 200 °C	
Meas. gas pressure	<ul style="list-style-type: none"> <li>GMP probe: depend. on purge air</li> <li>GPP probe: &lt; ±120 hPa</li> </ul>	Dependent on purge air	Dependent on gas conditioning	
Ambient Conditions				
Ambient temperature	-40 ... +50 °C; in 4 ranges adjustable		0 ... +50 °C	
Approval				
Conformities	EMV according to EN 61326			
Protection class	IP65		IP20	
Electrical safety	CE			
Inputs, Outputs, Controls via AWE Evaluation Unit				
Analog outputs	3 outputs: 0/4 ... 20 mA, max. load 500 Ω; electrically isolated			
Analog inputs	1 input: 0 ... 20 mA; optional for gas temperature and pressure			
Digital outputs	3 outputs: potential-free; 48 V AC/DC Status signal: malfunction (normally closed contact), maintenance request (normally open contact), function control (normally open contact)			
Digital inputs	3 inputs for the connection of floating contacts; for 24 V			
Interfaces	RS232 (service)			
Bus protocol	PROFIBUS (optional)			
General	Probe model	Cross duct model	Extractive analyzer	
System components	<ul style="list-style-type: none"> <li>Sender/receiver unit</li> <li>Measuring probe</li> <li>AWE evaluation unit</li> <li>Purge air for GMP probe</li> <li>Flange with tube</li> </ul>	<ul style="list-style-type: none"> <li>Sender/receiver unit</li> <li>Reflector unit</li> <li>AWE evaluation unit</li> <li>Purge air unit(s)</li> <li>Flange with tube</li> </ul>	<ul style="list-style-type: none"> <li>19" unit</li> </ul>	
Check function	Integrated check cycle for zero and span check			
Mounting	1 installation location on the duct	2 installation locations opposite on the duct	19" installation	

<sup>1)</sup> At 20 °C, 1000 hPa, 1 m measuring path. The maximum measuring ranges are subject to conditions on-site and on the individual configuration.

<sup>2)</sup> Maximum measuring range of the GME700 refer to GM700