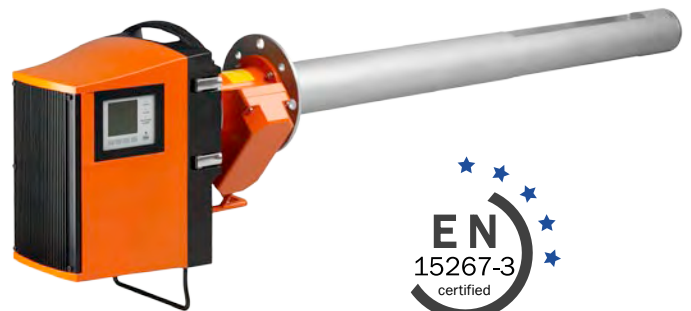


## GM32 In-situ Gas Analyzer

Simultaneous or individual measurement of  $\text{SO}_2$ ,  $\text{NO}$ ,  $\text{NO}_2$  and  $\text{NH}_3$  as well as temperature and pressure



**SICK**  
Sensor Intelligence.

# GM32

## Direct measurement of reactive gases

The GM32 in-situ gas analyzer measures the reactive gases SO<sub>2</sub>, NO, NO<sub>2</sub> and NH<sub>3</sub> as well as pressure and temperature in the gas duct – directly, fast and without gas sampling and transport. With this your process systems work with the true values in “real time”. Thanks to self monitoring you can rely on the measurement results at any time. And in case of a malfunction an early warning will be shown in time. For emission measurement of SO<sub>2</sub> and NO, GM32 is tested for suitability according to the new European standard EN15267-3.

SICK has brought the spectral DOAS evaluation method to perfection, because the GM32 now measures simultaneously in large as well as small measuring ranges with constant high precision. Concerning the cost of ownership, the in-situ analyzers from SICK have proven their superiority through minimum operating costs. Maintenance effort and problems caused by gas transport and gas conditioning do not even arise. Adjustment with test gases is not required.

### AREAS OF APPLICATION

- Control for flue gas purification
  - Desulphurization and denitrification plants
  - Washer and converter systems
- Emission monitoring
  - Systems according to EU Directives
  - Systems worldwide according to local regulations
- Monitoring of process parameters
  - Claus plant
  - Monitoring of landfill gases
  - Ammonia production

#### GM32 CROSS-DUCT

- Representative due to measurement over the complete duct diameter
- Ideal with aggressive or very hot gases – no duct installations
- Lowest measuring ranges for large duct diameters
- Unaffected by duct movement due to automatic self-alignment

#### GM32 GMP OPEN MEASURING PROBE

- Installation from one side
- For high dust concentrations
- Flexible use because of fixed active measuring path
- Integrated zero point path

#### GM32 GPP GAS PERMEABLE PROBE

- Gas test according to EPA possible
- For highest dust concentrations
- For turbulent gas flows
- Installation from one side
- Flexible use because of fixed active measuring path

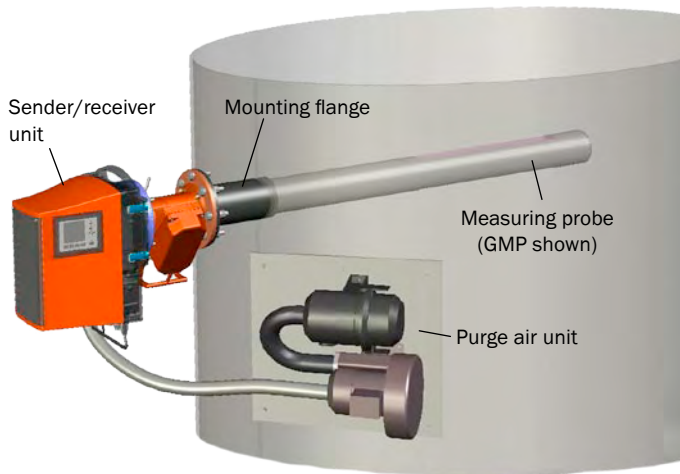
### KEY FEATURES

- Up to 6 measuring components at the same time (including sample gas pressure and temperature)
- Automatic self-test function (QAL3) without test gases
- Several independent measuring ranges with automatically optimized precision possible
- Direct measurement without sampling
- Reliable measuring results for high dust concentrations
- Very long maintenance-free intervals
- Modular design – enables fast on-site service

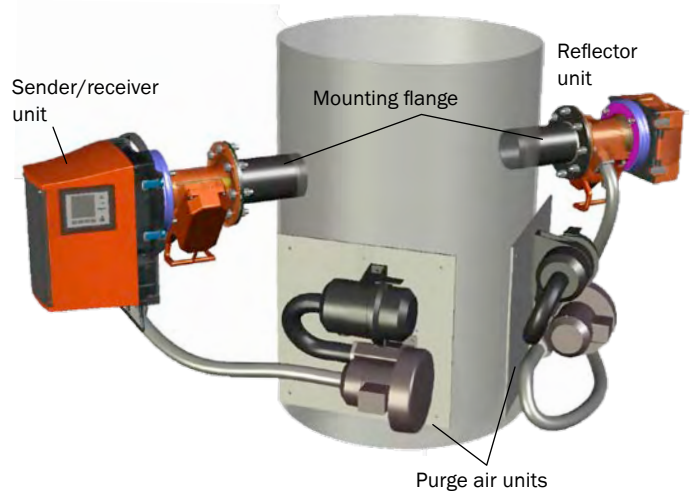


## GM32 SYSTEM VERSIONS

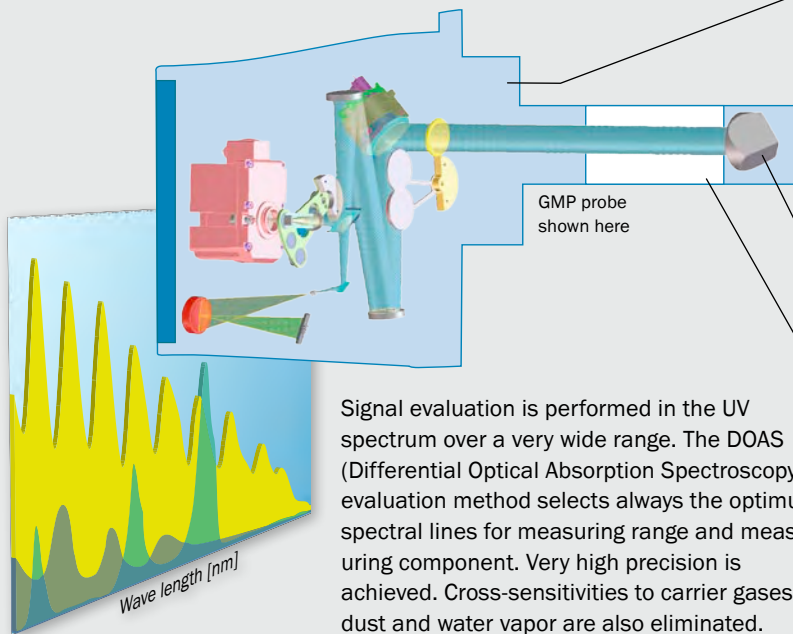
Probe version



Cross duct version



## DOAS MEASURING PRINCIPLE



Signal evaluation is performed in the UV spectrum over a very wide range. The DOAS (Differential Optical Absorption Spectroscopy) evaluation method selects always the optimum spectral lines for measuring range and measuring component. Very high precision is achieved. Cross-sensitivities to carrier gases, dust and water vapor are also eliminated.

### Sender/receiver unit (SR unit)

- Sends the UV beam through the active measuring path.
- Disperses the returning UV light spectrally with an optical grid onto the detector.
- Determines the gas concentrations from this spectrum according to the DOAS principle.

### Triple reflector (probe shown)

- Reflects the measuring beam back to the sender/receiver unit.

### Active measuring path in the gas duct

- Measuring probes: GMP with open measuring path or GPP with gas-permeable diffusion filter
- Cross-Duct: Sample gas path between the flange pipes from sender/receiver and reflector unit.

UV absorptions spectra

Technical Data		GM32	
<b>Measuring Parameters</b>			
Measuring components	SO <sub>2</sub> , NO, NO <sub>2</sub> , NH <sub>3</sub> , temperature, pressure		
Available measuring ranges (calibration ranges)	min.	max.	TÜV tested for suitability at T = 140 °C and active measuring path = 1,86 m
	SO <sub>2</sub> : 0 ... 40 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 20.000 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 75 mg/m <sup>3</sup> <sub>Standard</sub>
	NO: 0 ... 50 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 2.500 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 70 mg/m <sup>3</sup> <sub>Standard</sub>
	NO <sub>2</sub> : 0 ... 100 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 2.000 mg/m <sup>3</sup> <sub>Operation</sub> • m	-
	NH <sub>3</sub> : 0 ... 25 mg/m <sup>3</sup> <sub>Operation</sub> • m	0 ... 50 mg/m <sup>3</sup> <sub>Operation</sub> • m	-
Measurement uncertainty (related to stated meas. ranges)	<ul style="list-style-type: none"> <li>±2 % for SO<sub>2</sub>, NO, NH<sub>3</sub></li> <li>±5 % for NO<sub>2</sub></li> </ul>		
<b>Measuring Conditions</b>			
Sample gas temperature	≤ 500 °C; higher temperatures on request		
Process pressure	± 60 hPa (relative)		
<b>Ambient Conditions</b>			
Ambient temperature	-20 ... +55 °C		
<b>Approvals</b>			
Compliances for SO <sub>2</sub> and NO components	<ul style="list-style-type: none"> <li>EN 15267-3, EN 14181 and DIN ISO 14956</li> <li>TÜV-tested for continuous emission control according EC regulations (2001/80/EC, 2000/76/EC), plants of 27<sup>th</sup> FICA) and MCERTS<sup>1)</sup></li> </ul>		
Protection class	IP 65, IP 69K		
Electrical safety	CE		
<b>Inputs/Outputs, Interfaces</b> <b>Modules can be selected and extended as required</b>			
Analog outputs (option)	2 outputs <sup>2)</sup> : 0/2/4 ... 22 mA, max. load 500 Ω; max. 16 outputs		
Analog inputs (option)	2 inputs <sup>2)</sup> : 0/4 ... 22 mA, input resistance max. 100 Ω		
Digital outputs (option)	4 outputs <sup>2)</sup> : 48 V AC/DC, 0.5 A; make-contact, 1.0 W for 24 V; max. 8 outputs		
Digital inputs (option)	4 inputs <sup>2)</sup> : approx. 3.9 V, < 4.5 mA (closed contact), power dissipation 0.55 W (for 24 V)		
Interfaces	<ul style="list-style-type: none"> <li>RS232 (internal, service)</li> <li>Ethernet</li> </ul>	<ul style="list-style-type: none"> <li>Extendable via optional SCU operating unit</li> </ul>	
Bus protocol	<ul style="list-style-type: none"> <li>OPC</li> <li>TCP/IP via Ethernet (optional interface module)</li> </ul>		
<b>General</b>			
System components, versions	<b>Cross duct version</b> <ul style="list-style-type: none"> <li>Sender/receiver unit</li> <li>Reflector</li> <li>2 purge air attachments</li> <li>2 purge air units</li> <li>2 mounting flanges</li> <li>SCU operating unit (option)</li> </ul>	<b>Probe version</b> <ul style="list-style-type: none"> <li>Sender/receiver unit</li> <li>Measuring probe: <ul style="list-style-type: none"> <li>Type GMP with open measuring path or type GPP, gas permeable probe</li> </ul> </li> <li>Purge air unit (for GMP probe)</li> <li>Mounting flange</li> <li>SCU operating unit (option)</li> </ul>	
Operation	<ul style="list-style-type: none"> <li>Via display on the SR unit (option) and SOPAS ET PC software</li> <li>Via optional SCU operating unit</li> </ul>		
Control function	<ul style="list-style-type: none"> <li>Internal zero point control and soiling correction</li> <li>Check cycle (option) for zero and reference point test (equivalent to QAL3)</li> </ul>		
Installation	Direct installation at the measuring location		

<sup>1)</sup> Applied    <sup>2)</sup> Per Module



For further information and technical data concerning the analyzer, see:

- Data Sheet GM32, cross duct version, Part No. 8012710
- Data Sheet GM32, probe version, Part No. 8012713
- Operating Instructions GM32, cross duct version, Part No. 8012704
- Operating Instructions GM32, probe version, Part No. 8012707