



Internationally Approved
EN 15267 Certified

Continuous Emissions Monitoring
and Process Control

CO₂ Capture Plants

Continuous Emissions Monitoring and Process Control

CO₂ Capture Plants

The process control of a CO₂ capture plant needs good and reliable detection of gas phase NH₃ and CO₂. Measuring NH₃ is a challenge due to the corrosive environment and high concentrations of NH₃. Several places in the process need to be monitored and to transport a sample is difficult. A large dynamic range is needed as the NH₃ concentration can vary between 15% Volume and a few mg/m³. To use an extractive system in this environment will demand a lot of maintenance.

The OPSIS DOAS system is different and provides CO₂ capture plants with an accurate analyser that will operate with a minimum of maintenance. The OPSIS DOAS system is based on a non-contact method using an optical measurement path that can operate across the duct. The optical light is transported in an optical fibre to the analyser and one analyser can operate several paths.

Besides the measurements of NH₃, CO₂ can be measured with the same analyser. Additionally, several other gases can be measured with the DOAS system.

RETURN ON INVESTMENT

The cost of investing in an OPSIS DOAS system, to measure NH₃ and other gases, is small compared to the amount of money that can be saved by having better control of the process. The cost of the OPSIS DOAS system is also small compared to the amount of money that is spent on maintaining extractive measuring systems.

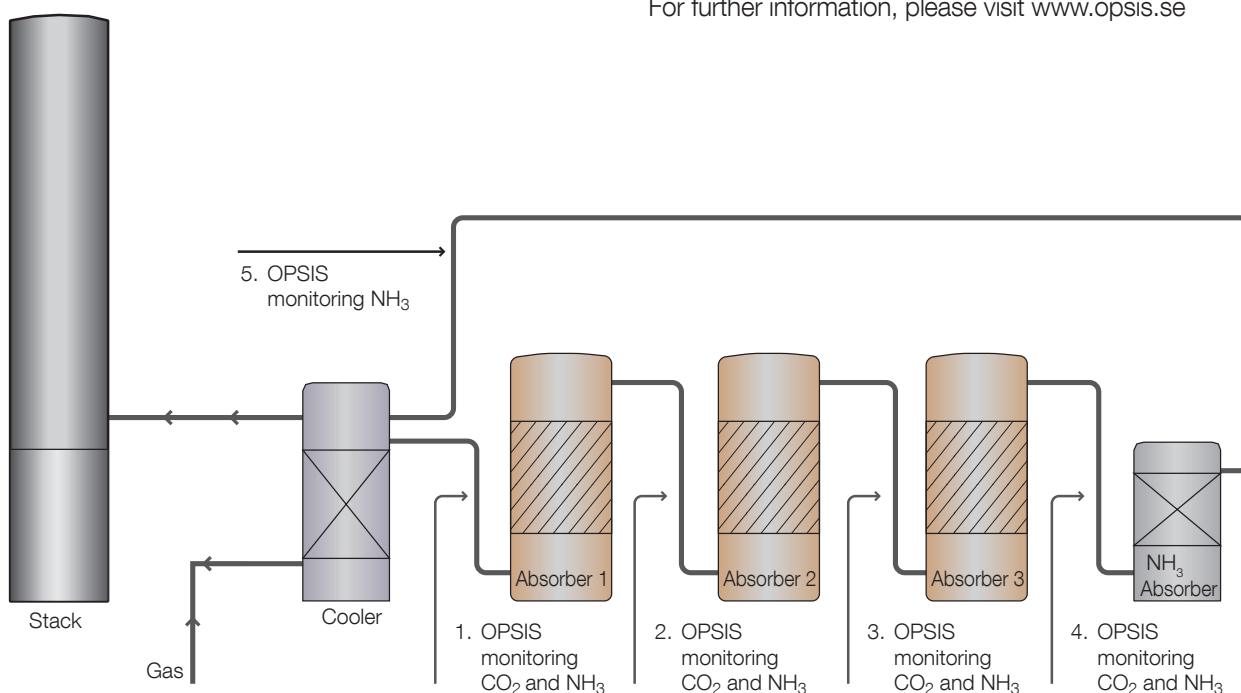
TEST AND APPROVALS

The OPSIS system has been tested and approved by a number of internationally recognized institutes and authorities. The system meets the European directive for power plants and is approved by German TÜV, British MCERTS and U.S. EPA. Full details are available on request.

OPSIS PRODUCT PORTFOLIO

OPSIS has a full product portfolio for measurement of gases in a CO₂ capture plant. It includes systems for continuous emissions monitoring, process control as well as for air quality monitoring. The total solution also includes highly skilled service and support.

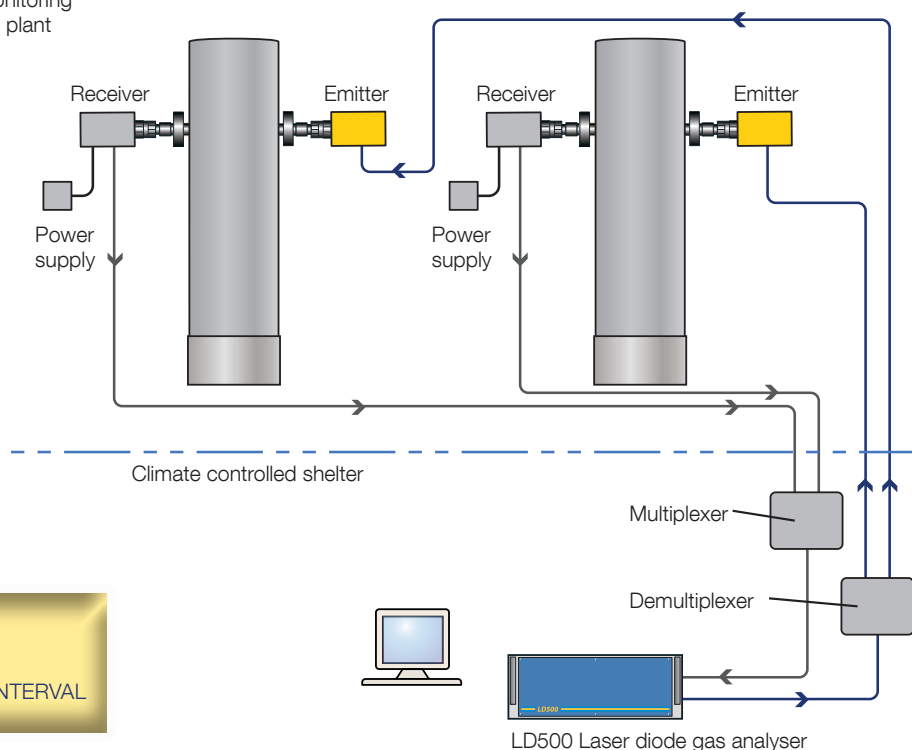
For further information, please visit www.opsis.se



A schematic drawing of a CO₂ capture plant including the measurement points of the OPSIS monitoring system

SYSTEM OVERVIEW

An OPSIS system layout for monitoring NH₃ and CO₂ in a CO₂ capture plant



QAL 1 CERTIFICATION:

BEST PERFORMANCE
LONGEST CALIBRATION INTERVAL

PERFORMANCE DATA

(typical data which may vary depending on application)

Compound	Max. measurement range (1 m path) ⁽¹⁾	Lowest measurement range according to EN 15267	Min. detectable quantities (monitoring path 1 m, measurement time 30 sec.)
UV/IR DOAS Analyser Models AR600 / AR602Z / AR602Z/Hg / AR602Z/N / AR602Z/NH_g / AR620			
NO ⁽²⁾	0–2000 mg/m ³	0–150 mg/m ³	0.5 mg/m ³
NO ₂	0–100% Vol.	0–20 mg/m ³	0.5 mg/m ³
SO ₂	0–100% Vol.	0–75 mg/m ³	0.5 mg/m ³
NH ₃ ⁽³⁾	0–1000 mg/m ³	0–10 mg/m ³	0.5 mg/m ³
Hg ⁰	0–1000 µg/m ³	0–45 µg/m ³	0.5 µg/m ³
H ₂ O	0–100% Vol.	0–30% Vol.	0.1% Vol.
CO ₂	0–100% Vol.	0–30% Vol. ⁽⁶⁾	0.5% Vol.
FTIR DOAS Analyser Models AR650 / AR650/N			
HCl	0–100% Vol.	0–15 mg/m ³	0.5 mg/m ³
CO	0–100% Vol.	0–75 mg/m ³	2 mg/m ³
H ₂ O	0–100% Vol.	0–30% Vol.	0.1% Vol.
HF	0–100% Vol.	0–1.5 mg/m ³	0.1 mg/m ³
NH ₃	0–100% Vol.	0–100 mg/m ³⁽⁵⁾	2 mg/m ³
N ₂ O	0–100% Vol.	0–500 mg/m ³	5 mg/m ³⁽⁴⁾
CH ₄	0–100% Vol.	0–20 mg/m ³	0.5 mg/m ³
CO ₂	0–100% Vol.	0–20% Vol.	0.1% Vol.
LD500 Laser Diode Gas Analyser			
NH ₃ process	0–100% Vol.	0–1% Vol. ⁽⁵⁾	0.1% Vol.
NH ₃ emission	0–5000 mg/m ³	0–10 mg/m ³⁽⁵⁾	0.5 mg/m ³
CO ₂	0–100% Vol.	0–30% Vol. ⁽⁶⁾	0.1% Vol.
H ₂ O	0–100% Vol.	0–30% Vol. ⁽⁶⁾	0.1% Vol.
O ₂	0–21%	0–20% Vol. ⁽⁶⁾	0.1% Vol.

Accuracy

Better than 2% of measured value or equal to the detection limit (whichever is greater).

Span drift

Less than 2% per year.
Please, refer to QAL1 documents.

Zero drift

Less than 2% of measurement range per year.
Please, refer to QAL1 documents.

Linearity error

Less than 1% of measurement range.

⁽¹⁾ This data refers to a light path of 1 m. For longer paths the maximum range is proportionally smaller. Products are available to create shorter paths in very wide stacks.

⁽²⁾ Maximum SO₂ concentration 5 g/m³ × m.

⁽³⁾ Maximum SO₂ concentration 500 mg/m³ × m.

⁽⁴⁾ Detection limit of 1 mg/m³ is optional with hardware upgrade.

⁽⁵⁾ Lowest measurement range.

- Recommended monitoring path length: 1 to 5 m.
- After wet scrubbers or when the particulate concentration is high, the monitoring path length may have to be reduced.
- Max. length of fibre optic cable: please refer to product sheets P9 and P16.

Continuous Emissions Monitoring and Process Control by OPSIS

No sampling required, non-contact measurement system

Operates with a minimum of maintenance

Best performance according to QAL 1 certification Longest

calibration interval according to QAL 1 certification Low

energy consumption

Gas calibration only once per year

Internationally approved

Thousands of systems installed worldwide

Serviced by highly skilled service network