

Increase Power Production



Run Your Power Plant More Efficiently

Internationally approved



How?

Install accurate measurement of NO₂

A34

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The total emission of NO_x is a parameter that can limit the total power output from a power station. NO_x limits are set according to European and local requirements and must not be exceeded.

When a power plant increases power output, NO_x emissions will increase, and when the NO_x emission reaches the limit, no additional power increase can be made.

NO_x is the sum of two gases, NO and NO₂. In many cases the measurement of NO_x is calculated by measuring the NO content and adding a calculated NO₂ value based on 5% of the NO value. For example, if the NO value is measured at 475 ppm, the NO₂ value can be calculated at 5% of this making 499 ppm in total. Historically this has been the accepted method for NO₂ determination, as accurate analysis of NO₂ at the typical levels produced has not been easy.

The Opsis UV DOAS system is different, and provides power plants with an accurate and fully certified analyser for NO₂ determination.

Measurements of NO₂ values taken from many different power plants around the world show that real NO₂ values are typically less than 1% of the emitted NO_x figure. By measuring the real NO₂ level, and adding it to the NO level at the correct amount, it is possible to run the power station nearer to the NO_x limit with the assurance that limits will not be breached.

With the example given, direct measurement of NO₂ gives a value of 5 ppm. To stay under the same 500 ppm level, the plant can now be run to an NO limit of 494 ppm.

Assuming that NO production is linear with power output, this would equate to an increase in power output to 4%.

Performance Data (typical data which may vary depending on application)

| Compound | Max. measurement range (1 m path) ⁽¹⁾ | Lowest TÜV and MCERTS approved measurement range | Min. detectable quantities (monitoring path 1 m, measurement time 30 sec.) | Zero drift (1 m path, max. per month) ⁽²⁾ | Span drift (per month, better than) | Linearity error (of measurement range, better than) | Max. length of fibre optic cable (when monitoring individual compounds) ⁽³⁾ | Hardware requirement |
|----------------------------------|---|--|---|---|--|--|---|----------------------|
| AR600/AR620 DOAS Analyser | | | | | | | | |
| NO ⁽⁴⁾ | 0–2000 mg/m ³ | 0–150 mg/m ³ | 1 mg/m ³ | ±2 mg/m ³ | ±2% | ±1% | 10 m | AR600/620 |
| NO ₂ | 0–100 mg/m ³ | 0–20 mg/m ³ | 0.5 mg/m ³ | ±1 mg/m ³ | ±2% | ±1% | 200 m | AR600/620 |
| SO ₂ | 0–5000 mg/m ³ | 0–80 mg/m ³ | 1 mg/m ³ | ±2 mg/m ³ | ±2% | ±1% | 100 m | AR600/620 |
| H ₂ O | 0–100% Vol. | 0–30% Vol. | 0.5% Vol. | ±1% Vol. | ±2% | ±1% | 100 m | AR620 |

⁽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.

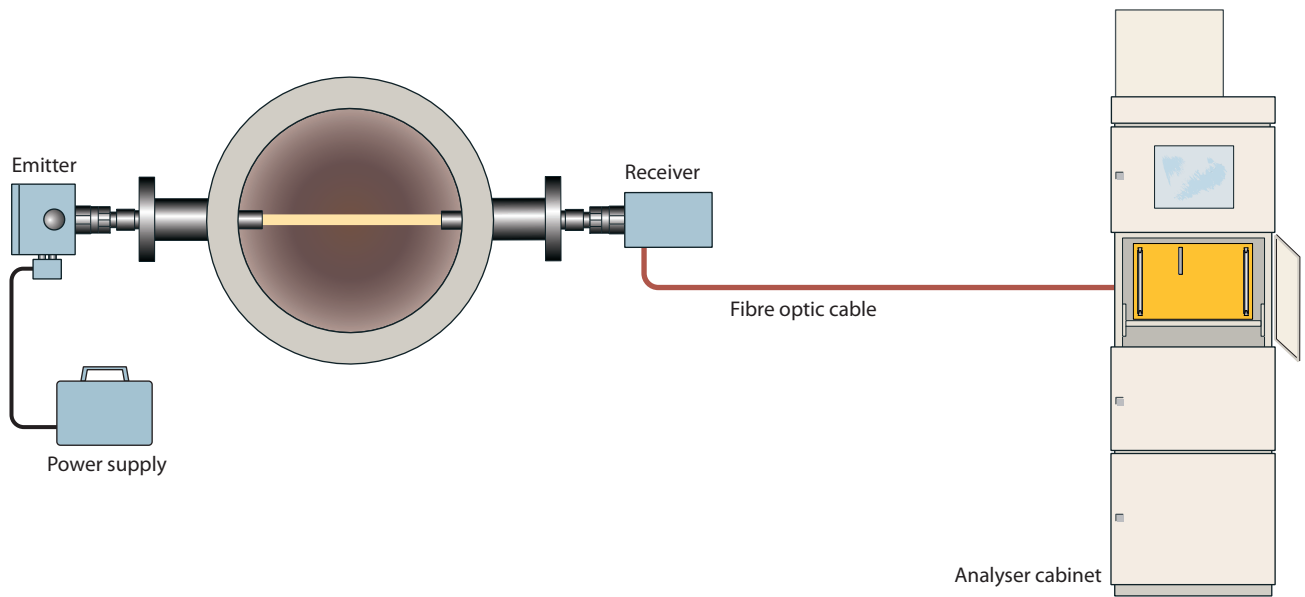
⁽²⁾ For AR650 the same values are valid as maximum zero drift per year.

⁽³⁾ When monitoring several compounds, the shortest fibre optic cable given by the set of components (refer to product sheet P9) has to be used.

⁽⁴⁾ Maximum SO₂ concentration 5 g/m³ × m

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

System Overview



The measurement is made by a cross-stack optical sensor. The Opsis UV DOAS system is designed for measuring low levels of NO₂ with high accuracy.

Return of Investment

The cost of an Opsis UV DOAS system to measure NO₂ is small compared to the amount of money that can be made by producing more power. The payback time for this investment can often be measured in weeks or months.

Additional Benefit

All of your power plant's existing CEMS measurements can be done on the same system as the NO₂ measurement, so if you already have a CEM the Opsis system can provide a redundant back-up or replacement system.

Approvals and Certification

Opsis systems have been tested and approved by a number of internationally recognised institutes and authorities. The system meets European Directive 2001/80/EC (LCPD) and is approved by German TÜV, UK MCERTS and U.S. EPA. Full details are available on request.

Opsis Product Portfolio

Opsis have a full product portfolio of analysers for gases in power plants, including complete CEM systems, TDL systems for measuring NH₃ in NO_x scrubbers, O₂ analysers and Hg analysers.

For further information, please have a look at our web site www.opsis.se

Please contact your Opsis supplier to discuss your particular system requirements, including the compounds you wish to monitor. Separate product and other industrial application sheets are available.

Specifications subject to change without notice

Why Opsis?

Increase Power Production by accurate NO₂ monitoring

Fast payback of investment

No sampling required, non-contact measurement system

Easy to install by use of optical fibre

Hundreds of systems installed worldwide

Serviced by highly skilled service network

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