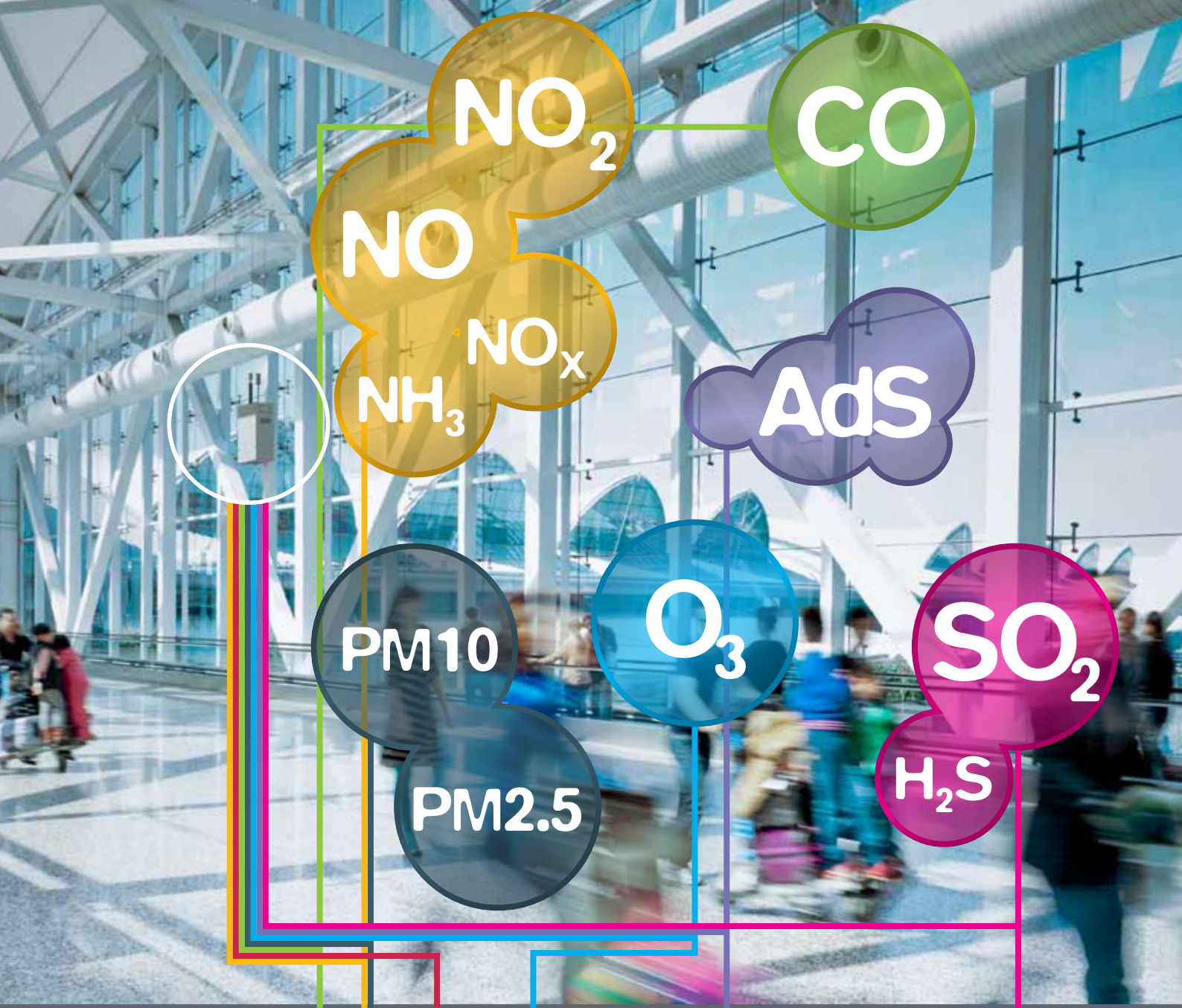



Next Generation Air Quality Monitoring

airpointer®

Compact air quality monitoring system

Flexible at point of interest

Modular configuration for each application

Easy web browser-based data access

airpointer®

Low power consumption, cost-effective operation

Approved compliance with legal standards

Successful through more than 30 years in the industry

# airpointer modules at a glance

**The airpointer is easy to install, cost-effective to operate, and easy to maintain.**

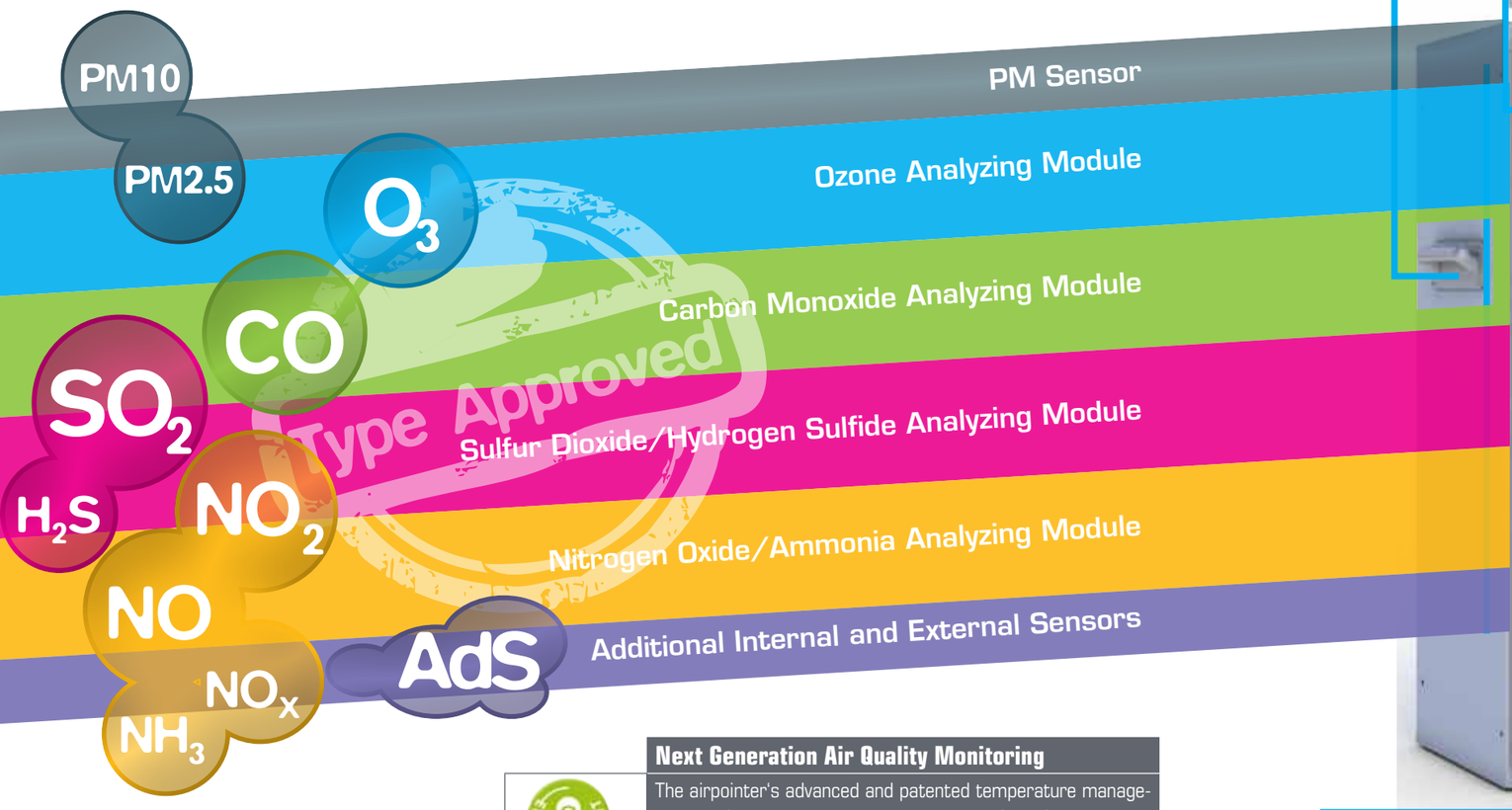
The **airpointer's modular** design comprising a base unit, analyzing modules and sensor modules allows for a configuration according to different application requirements.

The **airpointer's compact** design enables it to be installed almost everywhere. Due to its optimized thermal management, the airpointer consumes less power compared to conventional monitoring stations.

The airpointer offers a choice of analysis modules using **type approved reference methods** for monitoring airborne pollutants ($SO_2$, $NO_2/NO_X$, CO, $O_3$, and PM) classified as relevant by the EU, the WHO, the US-EPA and further responsible organizations all over the world.

A fast optical system or an **approved PM analyzer** is used for monitoring PM.

The **integrated data management system** records monitoring data of the airpointer's own analysis modules as well as various external third-party sensors. An **internal web server** enables data retrieval by using any Internet connection. Data are available worldwide via access authorisation and can be presented in clearly arranged graphics. All parameters can be displayed locally or online.




| | Next Generation Air Quality Monitoring |
|---|---|
| | The airpointer's advanced and patented temperature management and energy management systems reduce the power consumption by 90% versus comparable monitoring stations. |
| | According to EU directives<br>EN14625 ($O_3$), EN 14626 (CO), EN 14211 ($NO/NO_2/NO_X$), and EN 14212 ($SO_2$)<br>as well as the respective USEPA standards. |
| | The airpointer is produced according to ISO 9001:2008 and is subject to continuous enhancement. |

**Zero air supply**
for daily quality control for generating pollutant-free air.

**PM sampling inlet**
for continuous PM2.5, PM10 or TSP measurement depending on the configuration. Temperature-controlled to avoid the effects of humidity.

**Air sampling inlet**
continuously draws in air samples according to the respective directives.

**Handle**

**Computer**

**Gas spring strut**

**Maintenance door**
provides access for easy inlet filter changing, network connection, and a calibration gas inlet.

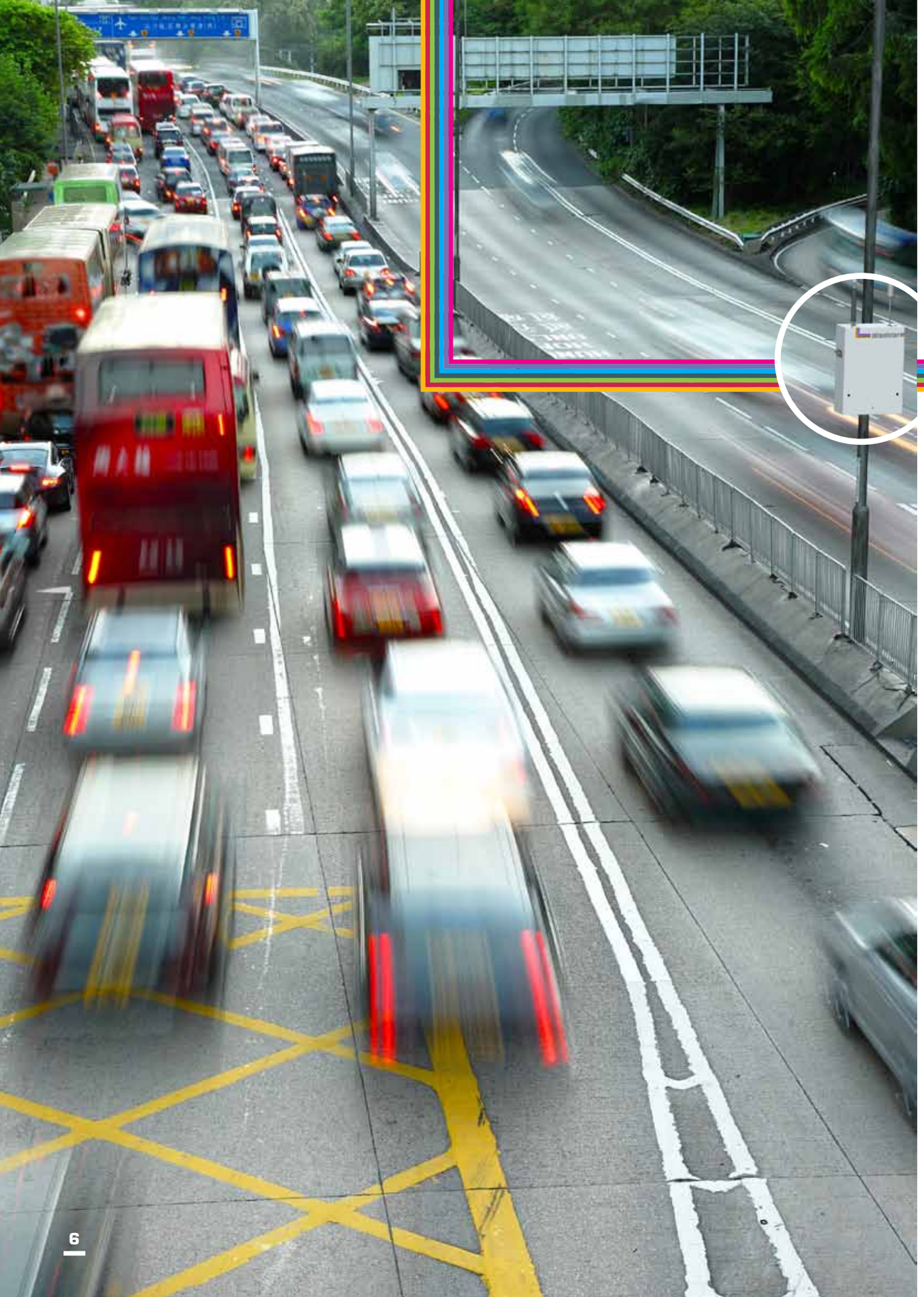




**Air conditioning**
controls the internal operation temperature to ensure measurement data quality.

**Pump**
draws sampling gas through modules using one or two pistons, depending on configuration.

**Extended lifetime filter**
A Teflon screen cylinder filter allowing for extended filter life even for high PM contamination may be used instead of the standard Teflon filter.



| | airpointer 2D | airpointer 4D | airpointer +PM |
|---|---|---|---|
| **Pollutants Standard modules** | 2 of the following modules | 4 of the following modules | 2 of the following modules |
| $NO/NO_2/NO_X$ | Weight: 12.0 kg/26.5 lbs, see page 12 for technical specifications; optional: span module | | |
| $NH_3$ | Only combined with $NO_X$ module | | |
| $O_3$ | Weight: 5.8 kg/12.8 lbs, see page 13 for technical specifications; optional: span module | | |
| $SO_2$ ($H_2S$) | Weight: 8.5 kg/18.7 lbs, see pages 14-15 for technical specifications; optional: span module; optional: $H_2S$ module | | |
| CO | Weight: 9.0 kg/19.8 lbs, see page 16 for technical specifications; optional: span module | | |
| **More sensor modules** | | | |
| | Photoionisation detector (PID) for volatile organic compounds (VOC) | | |
| | Nephelometer for indicative PM monitoring (PM10, PM2.5) | | |
| | Meteorological sensors: wind direction, wind velocity, temperature, air pressure, relative humidity, precipitation, made by various manufacturers | | |
| | Traffic data sensors: traffic count, made by various manufacturers | | |
| | Noise sensors, made by various manufacturers | | |
| | Electrochemical sensors for formaldehyde, ethane, chlorine… For industrial applications, environmental hygiene, and indoor air quality monitoring (IAQ) | | |
| | Sensors for monitoring indoor $CO_2$ (IAQ) | | |
| | Navigation system (GPS) for linking monitoring data with geographical data | | |
| | Type approved PM10 or PM2.5 monitor (Thermo 5030 SHARP, Met One BAM1020) | | |
| **Features (Model)** | | | |
| Dimensions (H/W/D, w/o handle and sample inlets) | 890/782/400 mm 35/30.8/15.8 in. | 1120/782/400 mm 44.1/30.8/15.8 in. | 1200/782/615 mm 47.2/30.8/24.2 in. |
| Weight | 65.8 kg/145.1 lbs | 73.9 kg/162.9 lbs | 110 kg/242.5 lbs |
| Power consumption* | max. 670 W | max. 670 W | max. 1100 W |
| Flow | <2000 ccm/min + 2000 ccm/min for nephelometer | <3000 ccm/min + 2000 ccm/min for nephelometer | <2000 ccm/min + 16.7 l/min for PM monitor |
| **Common features** | | | |
| Construction | Well-isolated double aluminium construction | | |
| | Standard monitoring modules on removable drawers | | |
| | Rugged, inconspicuous burglar-proof design | | |
| Standard equipment | Internal air conditioning and temperature control | | |
| | Maintenance door | | |
| | Cylinder lock (standard) | | |
| | Zero air supply | | |
| Operating temperature | -20 °C/-4°F to +42 °C/108°F (optional heating for down to -40 °C/-40°F) | | |
| Options | Various types of mounting brackets | | |
| | Wireless communication (GPRS, 3G,…) | | |
| | Sample gas conditioning (high relative humidity, high PM exposure) | | |
| | Integration of external devices and instruments (e.g. 4-20 mA, RS-232, Modbus via IP,…) | | |
| | Solutions to communicate with external data systems (e.g. TCP-IP, Modbus via IP, RS-232, 4-20 mA,…) | | |
| | Various base frames and handling devices for on-site operation (roadside, workshop, indoor, pickup truck, trailer,…) | | |

*

# Reliable point of interest monitoring

Ambient air quality with regard to health-harming substances also has to be considered on a small scale, because local microclimatic conditions may create an air quality considerably differing from a large-scale approach. Health hazards caused by a momentary pollutant concentration increase indicate the necessity of point of interest monitoring.

The airpointer is the ideal tool for monitoring combustion process gases and volatile emissions.

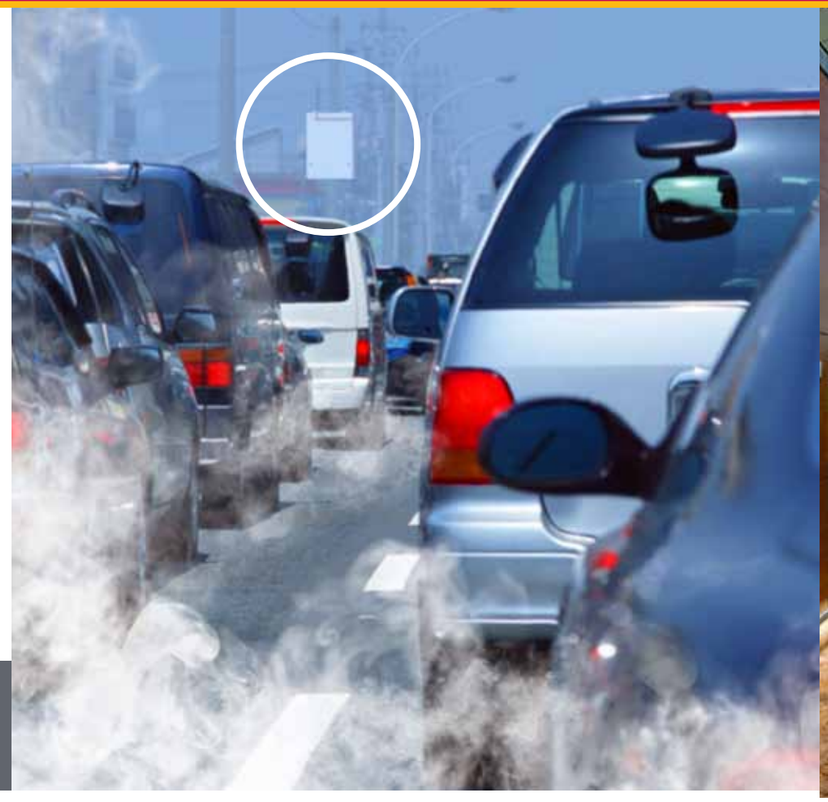
## airpointer at hot spots and indoors

The airpointer measures areas where people frequently stay and poor air quality affects the health of the individual.
Mainly highly frequented places as shopping street, traffic junctions or parks and sports grounds with an intense traffic-related air pollution require reliable measurement data because thresholds will often be exceeded.
People spend more than 80% of their time indoors. Frequently, indoor air quality is not better than outdoors. Therefore, continuous indoor air quality monitoring is essential considering that the health of young or elderly people or people in poor health above all suffers rapidly under poor indoor air conditions.

The airpointer provides reliable measurement data at highly frequented locations.

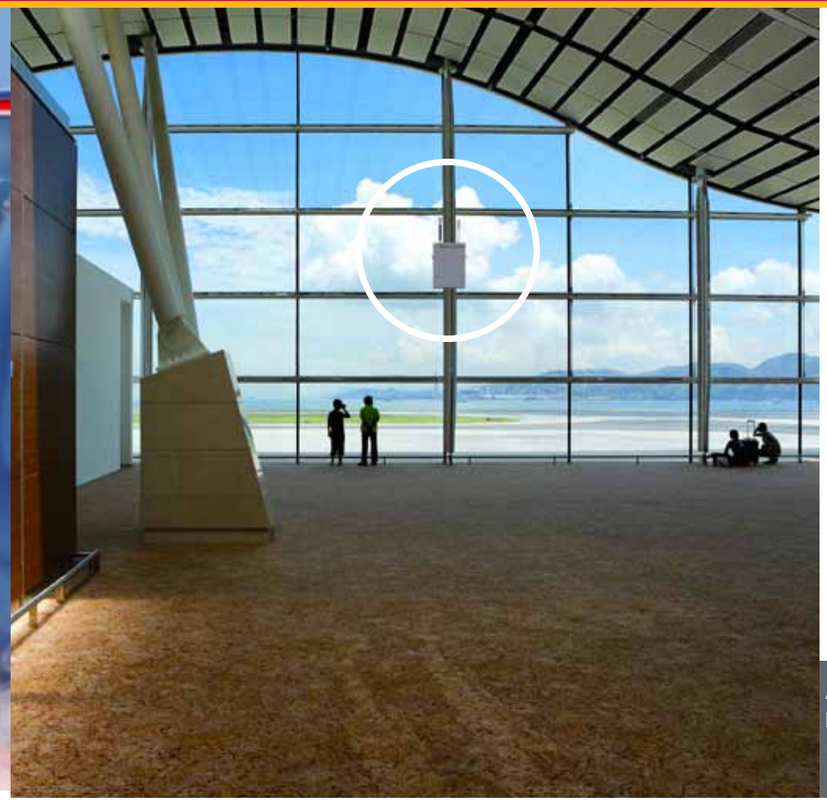
## airpointer in industry and traffic

Because of its high flexibility, the airpointer is the ideal tool for monitoring CO, $O_3$, $H_2S$, $SO_2$, $NO/NO_2/NO_x$ and PM. The traffic data sensor is one of many add-on sensors, which may be added quickly and simply. It enables measuring the number of vehicles and their average speed. Resulting data may be recorded and clearly displayed, for example in combination with nitrogen oxide and PM data.



Road traffic-related monitoring with the airpointer. Data may be used as control signals for a traffic management system.

**„We can generally choose what we want to eat and drink and where we want to be, but not the air we breathe.“**



Air quality monitoring at schools, public buildings, shopping malls, and airports (Indoor Air Quality / IAQ).

# Measuring where necessary

**Traditionally air quality monitoring stations are as big as building site containers, installed mostly on large-scale sites. Not the airpointer. It can be quickly installed, cost-effectively operated and easily maintained.**

## Mobile operation

It is often necessary to measure briefly at different sites. The compact design of the airpointer makes it the ideal tool for mobile operation.
The airpointer ensures flexible air monitoring while using the required reference measurement methods. The airpointer can be quickly transported by car or trailer to the measurement site where it is needed.

## Permanent installation

The airpointer is typically mounted on a pole (or a wall if necessary). Permanent installation is necessary when continuous monitoring over an extended period is required. The airpointer is lifted to the designated position with a crane and mounted with appropriate mounting brackets. It can be relocated within a minimal amount of time.

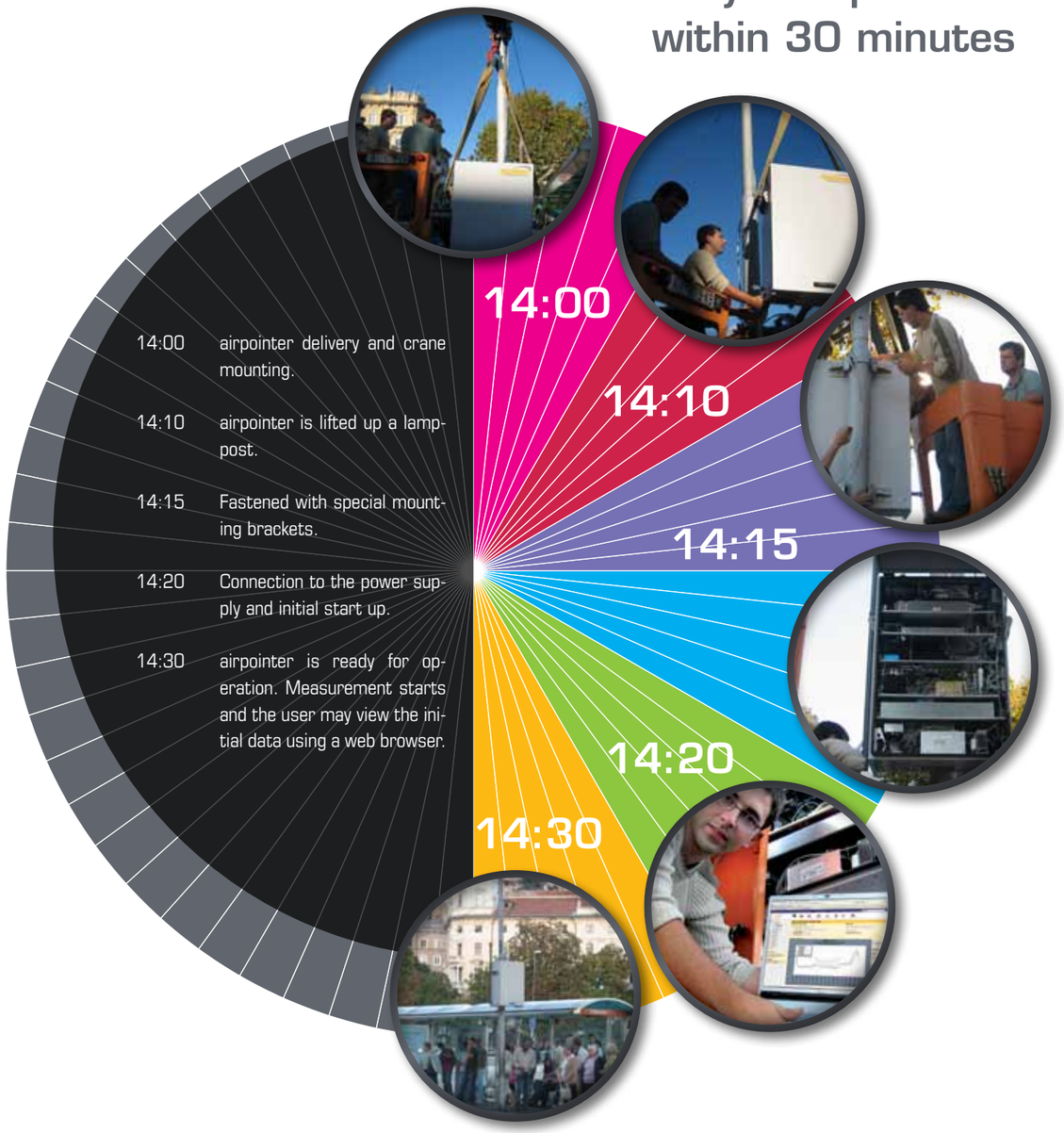
The airpointer can be transported on a pickup truck or a trailer of the right size.

Various options for wall or pole mounting are available.

Compact airpointer design enables it to be used for monitoring pollutants in tunnels.

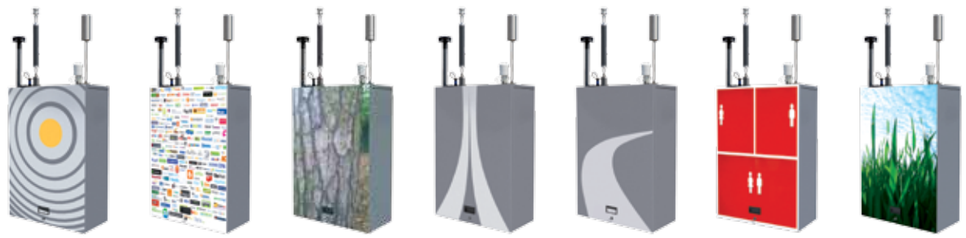


# Ready for operation within 30 minutes




# Personalize your airpointer

The airpointer is delivered in an unobtrusive design and can therefore blend in with its surroundings. By designing the front of the airpointer as you like you can purposely make it conspicuous or use it as advertising space.




# Nitrogen Oxides

## What is Nitrogen Oxide?

The nitric oxide (NO) molecule is quite reactive and unstable. In ambient air, it reacts with oxygen to form the toxic nitrogen dioxide ($NO_2$).

## Where does Nitrogen Oxide come from?

Nitrogen oxide is mainly an unwanted by-product of fuel combustion at high temperatures.
Cars and power plants are the main sources of nitrogen oxide.

## What are the effects of Nitrogen Oxide?

Nitrogen oxide causes a multitude of symptoms, primarily in the lungs but also in other organs such as the spleen and liver. Additionally, nitrogen oxide is jointly responsible for acidification and over-fertilisation of soil and water. Gaseous nitrogen oxide may become particulate ammonium nitrate. This contributes to large-scale PM (PM2.5, PM10) pollution. During the summer, nitrogen oxide and hydrocarbons cause formation of ground-level ozone and destruction of the ozone layer.

## Measurement Principle: Chemiluminescence (EN14211)

Nitric oxide in sample gas reacts with ozone to form nitrogen dioxide. This reaction results in electrically excited molecules. These molecules release their excess energy by emitting photons, which are measured by a photomultiplier tube. The airpointer $NO_X$ module is equipped with a delay loop to measure NO and $NO_2$ from the same sample.

## Zero Air Supply Check and Span Point Check

Zero air supply is part of the standard equipment so that a zero point check may be carried out automatically (e.g. daily).
An internal $NO_2$ source for a regular span point check is available as an option.

Ammonia ($NH_3$) is detected by reducing it to NO in a high temperature converter so it can be measured by the $NO_X$ module.

| Measured Compound | Nitrogen Oxides NO/$NO_2$/$NO_X$ |
|---|---|
| EU Directive / USEPA Procedure | Chemiluminescence (EN14211) |
| Measurement principle | Chemiluminescence |
| Range | Dynamic, up to 20 ppm |
| Zero noise | 0.2 ppb RMS |
| Lower detection limit | 0.4 ppb |
| Zero drift (24 hours) | < 0.4 ppb |
| Span drift (24 hours) | +/- 1% of reading > 100 ppb |
| Response time | < 60 seconds |
| Precision | 1% of reading or 1 ppb (whichever is greater) @ < 500 ppb |
| Linearity | ±1% of reading >100 ppm |
| Sample flow rate | 1000 ml/min |

Type Approved

Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria




# Ozone

## What is Ozone?

Ozone ($O_3$) is a highly toxic corrosive substance and a common pollutant. In low concentration it is a normal component of ambient air. Highly concentrated it is an aggressive irritant gas and at ground level it affects humans and nature.

## Where does Ozone come from?

Ozone is formed in the atmosphere by reaction of nitrogen oxides, hydrocarbons, and sunlight. Ozone protects us in higher air layers (stratosphere) from harmful UV radiation. At ground level, higher ozone concentrations form only by other pollutants (ozone precursor chemicals) and sunlight. Nitrogen oxides and volatile organic compounds are the main precursors. Furthermore, methane and carbon monoxide (CO) contribute to the global formation of ozone. Insolation promotes the formation of ozone. High ozone concentrations thus occur mostly at midday and in the afternoon. Major sources of ozone are the chemical processes caused by industry and traffic as well as electrical current of television sets, computers, photocopiers, and electric motors (using brushes).

## What are the Effects of Ozone?

Ozone causes above all respiratory ailments such as respiratory syndromes, changes in pulmonary function, increased respiratory sensitivity, and inflammation of the respiratory tract. Ozone additionally destroys the foliage of trees and other plants (photooxidation), thus aggravating the environment.

## Measurement Principle: UV absorption (EN 14625)

A beam from a high-energy UV lamp is directed through a tube filled with sample gas. Absorption effected by ozone is measured with a detector at the end of the tube.

## Zero Air Supply Check and Span Point Check

Zero air supply is part of the standard equipment, so that a zero point check may be carried out automatically (e.g. daily).
An internal ozone generator for a regular span point check is available as an option.

| Measured Compound | Ozone $O_3$ |
|---|---|
| EU Directive / USEPA Procedure | UV photometry (EN14625) |
| Measurement principle | UV photometry |
| Range | Dynamic, up to 20 ppm |
| Zero noise | 0.25 ppb RMS |
| Lower detection limit | 0.5 ppb |
| Zero drift (24 hours) | < 1 ppb |
| Span drift (24 hours) | ±1% of reading or 1 ppb (whichever is greater) |
| Response time | < 30 seconds |
| Precision | 1 ppb |
| Linearity | +/- 1% of reading > 100 ppb |
| Sample flow rate | approx. 1000 ml/min |

Type Approved

Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria

# Sulfur Dioxide $SO_2$

# Hydrogen Sulfide $H_2S$

## What is Sulfur Dioxide?

Sulfur dioxide ($SO_2$) is an acid-forming, colorless, foul-smelling and toxic gas.

## Where does Sulfur Dioxide come from?

$SO_2$ mainly comes from burning coal and heavy fuel oil. Major sources are firing systems in energy business, in industry, and small-scale heating systems that use poor quality sulfurous oil or coal.

## What are the effects of Sulfur Dioxide?

Sulfur dioxide may cause humans to suffer from headaches, nausea, reductions in pulmonary volume, increases in breathing resistance, and symptoms such as wheezing, chest tightness, and shortness of breath. Sulfur dioxide is one of the major „acid rain" precursors which compromises ecological systems such as forests and lakes as well as it accelerates corrosion of buildings and monuments. Sulfur dioxide may reduce visibility as part of smog.
Furthermore, particulate sulfate adds to large-scale PM (PM2.5, PM10) pollution.

## Measurement Principle: UV Fluorescence (EN14212)

Sample gas is lighted with an UV lamp, which causes the $SO_2$ molecule to absorb energy. The absorbed energy is emitted as a light pulse (photon) which is measured with a photo multiplier.

## Zero Air Supply Check and Span Point Check

Zero air supply is part of the standard equipment, so that a zero point check may be carried out automatically (e.g. daily).
Internal $SO_2$ sources for a regular span point check are available as an option.

| Measured Compound | Sulfur Dioxide $SO_2$ and Hydrogen Sulfide ($H_2S$) |
|---|---|
| EU Directive / USEPA Procedure | UV Fluorescence (EN14212) - for $SO_2$ |
| Measurement principle | UV fluorescence |
| Range | dynamic, up to 10 ppm |
| Zero noise | 0.25 ppb RMS |
| Lower detection limit | 0.5 ppb |
| Zero drift (24 hours) | < 1 ppb |
| Span drift (24 hours) | ±1% of reading >100 ppb |
| Response time | < 90 seconds |
| Precision | 1% of reading or 1 ppb (whichever is greater) |
| Linearity | ±1% of maximum >100 ppb |
| Sample flow rate | 500 ml/min |

Type Approved

Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria



## What is Hydrogen Sulfide?

Hydrogen sulfide ($H_2S$) is a highly toxic and corrosive, nauseously smelling gas.

## Where does Hydrogen Sulfide come from?

$H_2S$ is a gas that results from biodeterioration and biodegradation. Major sources are refineries, furnaces, pulp and paper industry, gasworks, coking plants, sewage plants, and biogas plants.

## What are the effects of Hydrogen Sulfide?

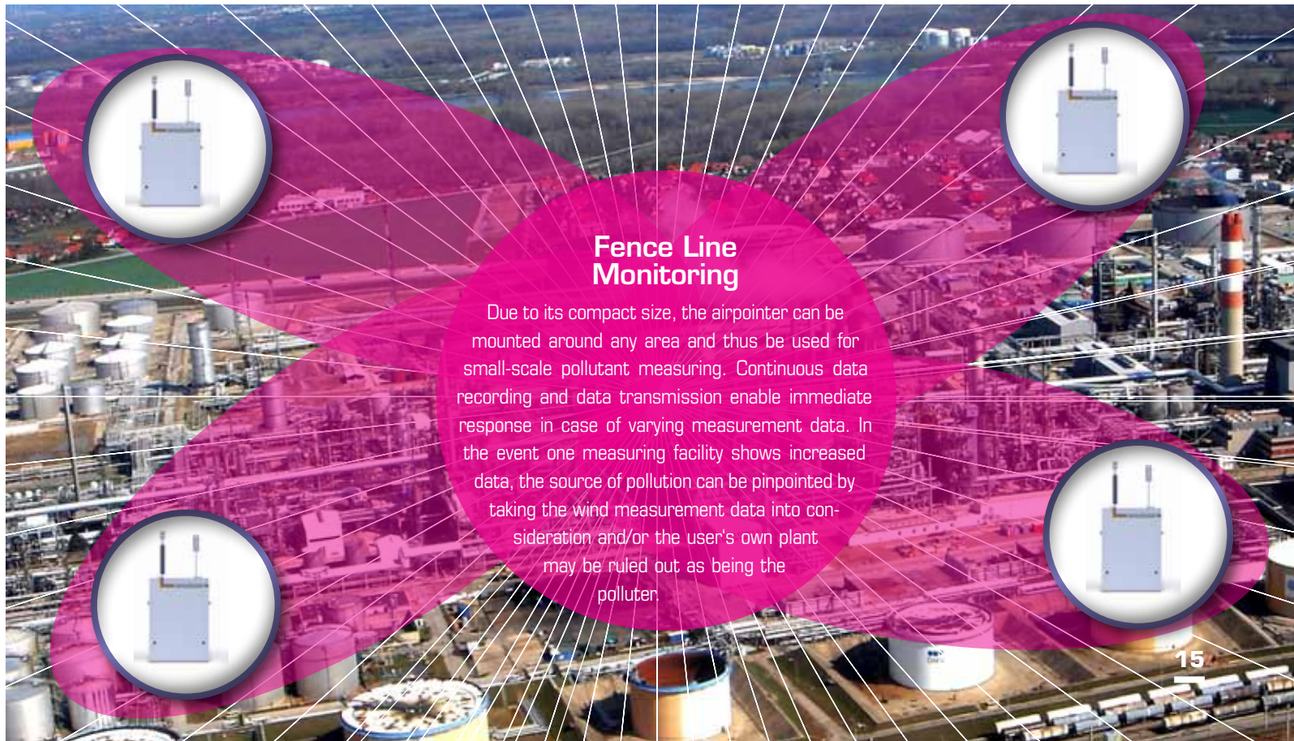
$H_2S$ destroys the body's own hemoglobin and paralyses oxygen transport in blood. When it comes in contact with mucous membrane, it converts to form alkaline sulfides and causes eye, nose, throat and lung irritations. Its high acidity makes $H_2S$ a corrosive gas and may cause damage to electronic components.

## Measurement Principle: Thermal conversion to $SO_2$

$SO_2$ is scrubbed from the sample gas. $H_2S$ is thermally converted to $SO_2$ and measured by UV fluorescence. Equipped with an $H_2S$ module the airpointer measures only $H_2S$ or only $SO_2$ or both cycling with a minimum switching time of five minutes.

## Zero Air Supply Check and Span Point Check

Zero air supply is part of the standard equipment, so a zero point check may be carried out automatically (e.g. daily).
Internal $H_2S$ sources for a regular span point check are available as an option.



### Fence Line Monitoring

Due to its compact size, the airpointer can be mounted around any area and thus be used for small-scale pollutant measuring. Continuous data recording and data transmission enable immediate response in case of varying measurement data. In the event one measuring facility shows increased data, the source of pollution can be pinpointed by taking the wind measurement data into consideration and/or the user's own plant may be ruled out as being the polluter.


# Carbon Monoxide

## What is Carbon Monoxide?

Carbon monoxide (CO) is an extremely toxic gas resulting from incomplete combustion of carbon and carbonaceous products.

## Where does Carbon Monoxide come from?

Carbon monoxide is mainly a product of incomplete combustion of fuel and propellants. Major sources are traffic, industry and smoking indoors.

## What are the effects of Carbon Monoxide?

CO as pollutant is especially significant because of its toxic effect to humans (damaging hemoglobin). Furthermore CO plays a significant role for photochemical generation of ground-level ozone on a global scale.
A certain concentration may reduce the amount of oxygen received by a person's brain. The person may lose conscience or suffer permanent brain damage caused by lack of oxygen. Carbon monoxide may also contribute towards global warming.

## Measurement Principle: NDIR Gas Filter Correlation (EN14626)

An infrared source beam is directed through a chamber filled with sample gas.
Carbon monoxide absorbs this light. A photo-detector measures the emanating decrease.

## CO Scrubber Check and Span Point Check

A „CO scrubber" (catalytic converter) removes CO from the sample, so a zero point check may be performed automatically (e.g. daily).
An internal CO source for a regular span point check is available as an option.

| Measured Compound | Carbon Monoxide CO |
|---|---|
| EU Directive / USEPA Procedure | NDIR gas filter correlation (EN14626) |
| Measurement principle | NDIR gas filter correlation |
| Range | Dynamic, up to 1000 ppm |
| Zero noise | 0.02 ppm RMS |
| Lower detection limit | 0.04 ppm |
| Zero drift (24 hours) | < 0.1 ppm |
| Span drift (24 hours) | ±1% of reading >10 ppm |
| Response time | < 60 seconds |
| Precision | ±0.1 ppm |
| Linearity | ±1% of reading < 1,000 ppm |
| Sample flow rate | approx. 500 ml/min |

Type Approved

Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria




# Additional Sensors

## Additional airpointer Sensors

Apart from the already installed modules the airpointer offers capabilities for implementing additional sensors and external instruments using the high performance airpointer data recording. These sensors are integrated via Ethernet, RS-232 or analogue interfaces. Additional sensors are mounted outside or inside the airpointer depending on the space available.

The airpointer continuously manages and controls measurement data via a web based user interface. The high-performance airpointer features can be used for each additionally implemented sensor. This includes data recording over a period of several years, data backup and faster data access via the recordum portal, data download for local analyses and more.

The meteorological sensor Lufft WS 600 records the parameters wind direction, wind velocity, temperature, air pressure, relative humidity and precipitation.


„The more we measure, the more we know"

## Additional Sensors

| |
|---|
| **Road traffic and public places** |
| Noise level |
| Pedestrian counts |
| PM sampling |
| PM monitoring |
| Navigation systems (GPS) |
| UV radiation |
| **Industrial hygiene** |
| Toxic gases |
| Volatile organic compounds (VOC) |
| **Indoor air quality** |
| Carbon monoxide ($CO_2$) |
| Oxygen ($O_2$) |
| Relative humidity |
| Temperature |
| Light intensity |


# Particulate Matter

## What is Particulate Matter?

PM10 and PM2.5 are not single components but the mass concentration of all ambient air particles with an aerodynamic diameter smaller than 10 µm (PM10) or 2.5 µm (PM2.5).

## Where does Particulate Matter come from?

Thresholds of these pollutants are frequently exceeded, especially in areas with strong vehicle traffic air pollution. This leads to an increased public awareness of PM issues.

Particulate matter comes from diesel exhaust particles, tire wear, brake dust, and swirling road dust generated by vehicle traffic.

## What are the effects of Particulate Matter?

PM2.5 and PM10 have a short-term effect on the cardiovascular system. Evidence of a direct relation between the number of heart attacks and PM concentration has been substantiated. For instance, a long-term effect of PM pollution is the potential to carry and hold toxic compounds in the respiratory system. Particles in lungs and bronchia weaken the immune system.

## Measurement Principle: Nephelometry

The airpointer PM module uses nephelometry, the proven optical method of measurement. A sample heater minimizes the effects of humidity. The module uses a light-scattering photometer with a near-IR LED, a silicon detector hybrid preamplifier and a reference detector. The scattered light is proportional to PM concentration.

## Size selection

A TSP inlet is part of the standard equipment of the PM module. Simply change the optionally available size-selective inlets to measure PM10 or PM2.5.

| Measured Compound | Particulate Matter |
|---|---|
| EU Directive / USEPA Procedure | Particle collecting and gravimetric analysis |
| Measurement principle | Nephelometry |
| Range | Dynamic, up to 2,500 µg/m³ |
| Lower detection limit | < 1 µg/m³ |
| Zero drift (24 hours) | < 1 µg/m³ |
| Span drift (24 hours) | ±1% of reading |
| Response time | < 60 seconds |
| Precision | 1 µg/m³ |
| Sample flow rate | 2 l/min |



Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria

## airpointer +PM

The airpointer +PM can be equipped with an approved PM analyzer. Furthermore, you may connect the airpointer to an external PM analyzer by using the available interfaces. Thus you may as well use the airpointer's advantages especially within data recording and data transfer for measuring PM.

## Measurement Principle: Beta Ray Attenuation

Beta ray attenuation is a radiometric measurement. The particles are deposited on a filter belt and exposed to beta radiation. Varying beta absorption during sampling defines the mass of the deposited particles.

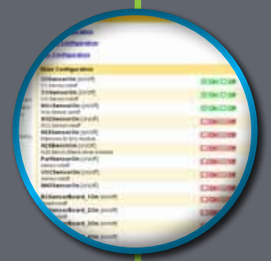

The airpointer +PM comes with an approved PM analyzer integrated into the housing.

| Measured Compound | Particulate Matter |
|---|---|
| EU Directive / USEPA Procedure | Particle collecting and gravimetric analysis |
| Measurement principle | Beta ray attenuation |
| Radiation source | $^{14}C$ (Carbon14) 60 µCi ±15 µCi, half-life of 5730 years |
| Range | Dynamic, up to 1.000 mg/m³ |
| Lower detection limit (24 hours) | < 1 µg/m³ |
| Zero drift (24 hours) | < 1 µg/m³ |
| Resolution | 0.1 µg/ m³ |
| Sample flow rate | 16.7 l/min |

Sources: WHO Regional Publications, European Series, No. 91, „Air quality guidelines for Europe", 2nd edition, 2000; Federal Environment Agency Vienna, Austria

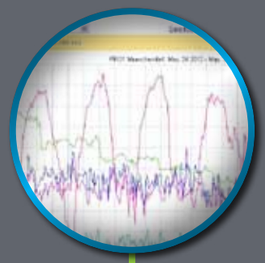
# airpointer interface

**Download**
All parameters can be downloaded easily and quickly to your PC. You may configure the default selection of parameters and use Excel for further processing for example.

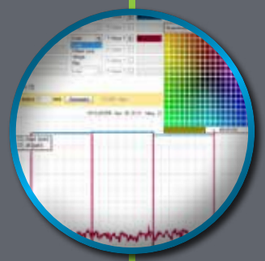


**Setup**
Setup is used for settings in general. Here you may enable or disable the various modules and change units such as ppb and µg/m³.


**Measurement campaign**
Measurements may be assigned to defined time periods and locations.



**Measurement data displayed in a time diagram**
One to six parameters are displayed in a clearly arranged graphic. Zoom function allows for detailed viewing.



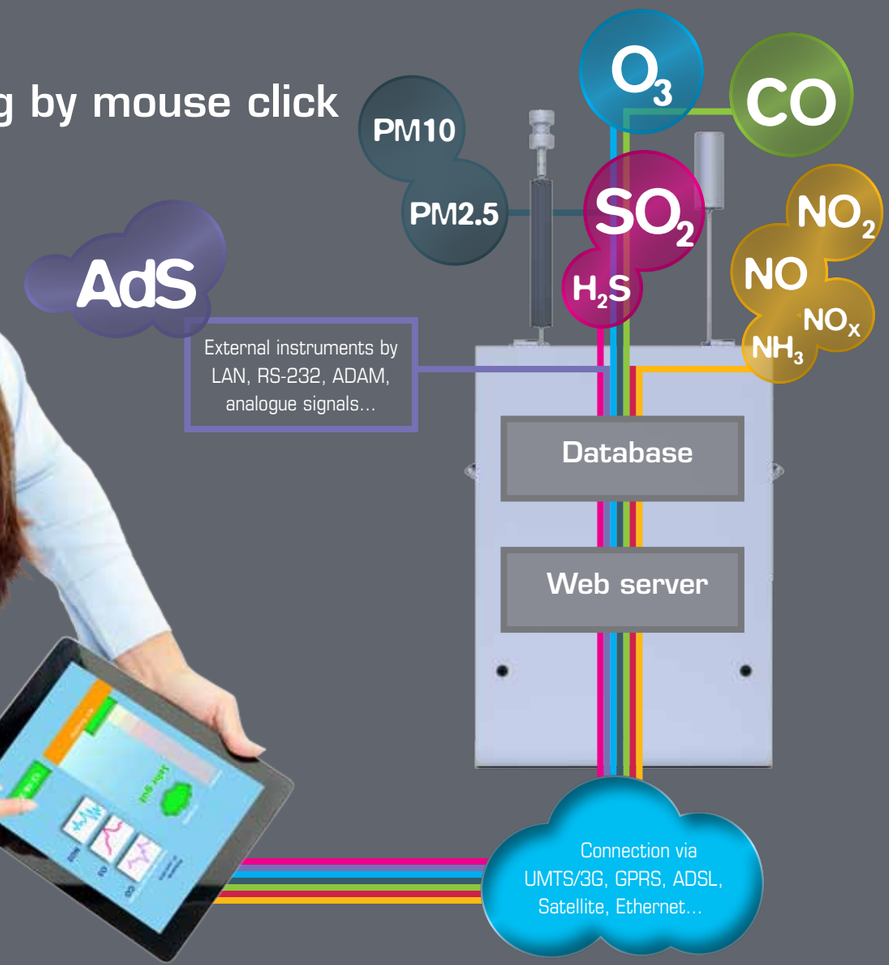
**Graph design**
For the purpose of clarity, you may present measurement data in different form and in various colors: as a line, a filled line, a step or a bar diagram.

**Radar chart/wind rose**
Measurement data may be displayed in relation to wind direction to localise pollution sources.


**Reports**
Reports may be defined and automatically created. The results are converted to pdf or xls files.



# Air monitoring by mouse click




**Public information**
Use the device of your choice to access airpointer data.

Next generation air quality monitoring also provides further capabilities for acquiring data. The airpointer is „live on air" at all times and may be accessed by authorised persons via the Internet using a web browser. No special software is necessary. The user may quickly and easily view, download and analyze **measurement data**, update the **data recording system** from anywhere in the world and automatically forward **maintenance information** by e-mail.

## Data access

The user may access data via modem (GSM, GPRS, UMTS) or LAN (direct, cable, or wireless). A separate maintenance interface shows real-time data.
The data recording system is also equipped with an interface for communicating with devices made by other manufacturers. Automated downloads allow for data transmission to a central data acquisition system.

## Password protected access

User interface access on various levels requires a login name and is password-protected. An optional alarm system sends a text message via SMS in the event of unauthorized access.

## Linux operating system

A Linux-based data processing system guarantees complete Internet connectivity as well as high reliability and flexibility. Data security is provided by an automated internal backup based on a mirrored hard drive.

## What is saved?

**Measurement data**: Depending on the selected modules, data are recorded on an internal hard drive with a minimum storage capacity for five years.
**Operational data:** Temperature of heated and cooled parts, air pressure and fan rotation speed etc. are stored in the database.

## Data backups

Capabilities are provided to also automatically save data to a central server – continuously, so to speak. A network of monitoring systems may also be established using the recordum portal server.

Quality assurance

# QA/QC

## Many years of security, reliability and continuity

The airpointer has been developed by experts with field experience with special emphasis placed on data quality assurance. recordum quality management is certified for research, development and production in accordance to ISO 9001:2008 standards.
Only a minimum amount of maintenance is necessary to continuously guarantee the quality of the measurement data. The filter, absorbent and zero air cartridge should be checked regularly while the device is operating. The modules and electronics must be checked once a year. The airpointer is equipped with a large number of functions for controlling and maintaining operation, which are easy to use, clearly displayed, and quickly implemented.

## Calibration

A span gas port in the **maintenance door** is provided for calibrating the airpointer with external span gas. The user does not have to open the front door thus leaving the temperature inside unaltered. The airpointer is calibrated using a **graphic interface** in the user menu, which displays the parameters to be calibrated in a concentration-time-diagram. Thus the user may evaluate stability of both measurement signal and span gas concentration. After calibration, the airpointer displays a message indicating whether or not the calibration was successful. The calibration data are saved and can be retrieved at any time.

## Software

A user network connection (RJ45) located behind the maintenance door is provided for local operation and **monitoring of all device functions**. Extensive diagnostic functions included in the software are used to continuously monitor all key operating parameters and save them once a minute in the system data base for preventive fault detection and tracking the effect of faults on measurement data.
A separate program (**watchdog**) additionally controls correct operation and automatically repairs any faults that may occur. Changes of site, calibrations, faults and their remedies etc. can be entered in an electronic station logbook. You may further increase data security by using an automatic **backup** with the recordum portal independent of the airpointer.

## Operational test

Each airpointer features internal **zero air generation** for automatic or manual zero point check of each module. You may individually select a zero point check or an automatic adjustment.

You may optionally check all gas ambient air analyzer modules individually using **internal span gas generation** and the following methods.

**Ozone**

An ozone generator generates a constant sample flow of ozone using a UV lamp.

**Carbon Monoxide**

Span is generated using a refillable calibration gas cylinder and an internal dilution system.

**Nitrogen Dioxide, Sulfur Dioxide/Hydrogen Sulfide**

A permeation tube contains the condensed airborne pollutant in liquid form and releases it at a constant high temperature (ensured by a controlled oven) via a membrane.

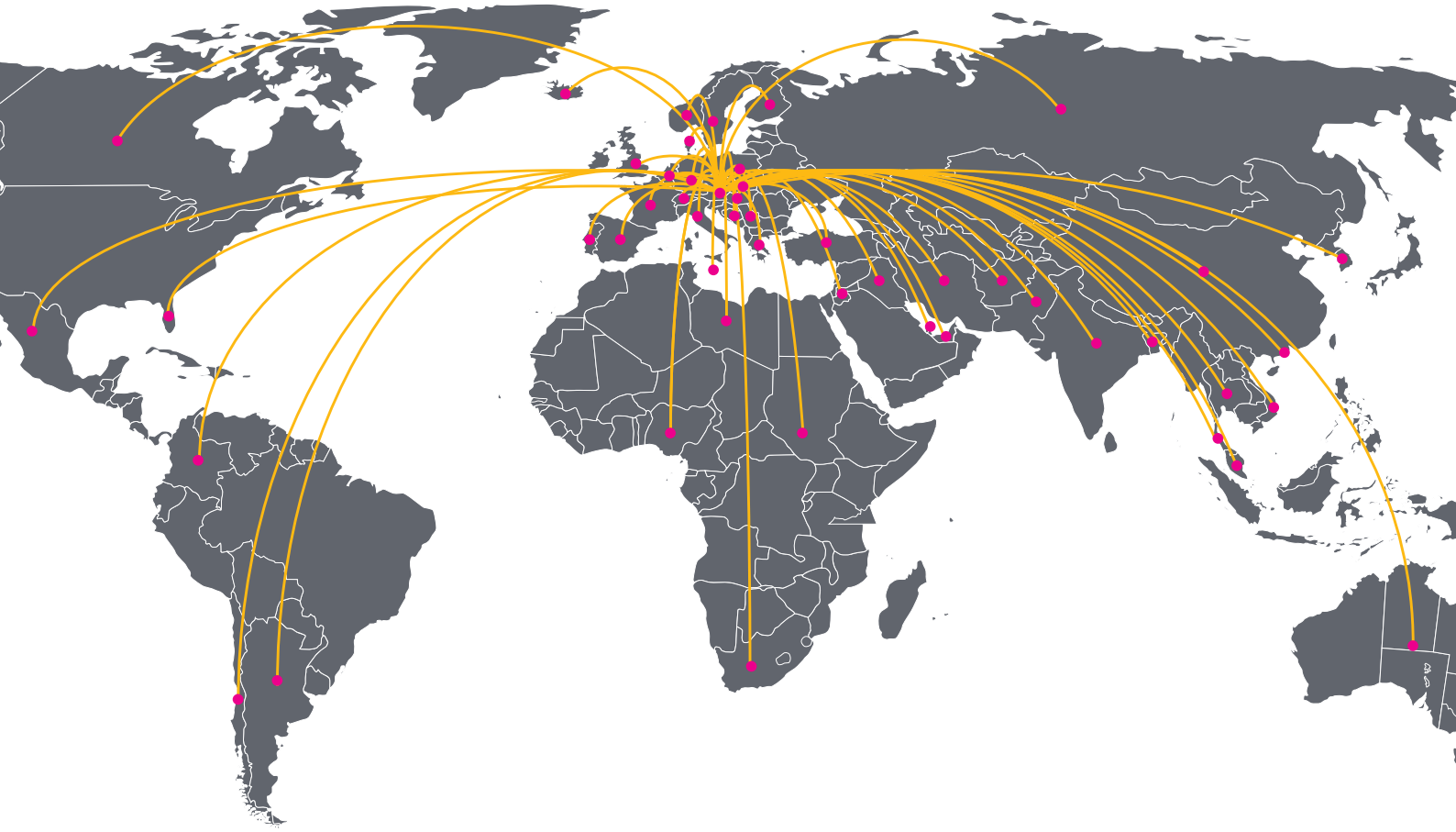
The user may track at all times the results of the internal operational test that are saved in the airpointer **database**.

## Filter changing

The filter holder is also located in the vicinity of the **maintenance door**. The filter holder features a glass plate to check the cleanliness of the filter and if it is properly seated. An optional extended **lifetime filter** with a greater volume extends the intervals between filter changes.

The side maintenance door is provided for quick and simple maintenance.
Maintenance switch, sample gas filter, notebook network connection (RJ45), sample gas inlet, notebook power supply.

# recordum - Distribution Network



## Next Generation Air Quality Monitoring

The airpointer is a compact and modularly designed ambient air quality monitoring system for airborne pollutants using internationally defined reference methods that enables you to carry out air quality monitoring at hot spots or other sites with a high ecological relevance.
A web browser enables access to clearly arranged graphics of measurement data.
The airpointer is easy to install, cost-effective to operate, and easy to maintain.

In addition to the airpointer, recordum develops and produces further solutions:
airQlog for storing, managing and displaying data of several air quality monitoring instruments and air quality monitoring sensors.
airQrate for providing precise concentrations of calibration gases and other required gases.
waterpointer for monitoring water quality.
Convenient system solutions for monitoring indoor air quality.

| | **Next Generation Air Quality Monitoring** |
|---|---|
| | The airpointer's advanced and patented temperature management and energy management systems reduce the power consumption by 90% versus comparable monitoring stations. |
| Type Approved | According to EU directives EN14625 (O3), EN 14626 (CO), EN 14211 ($NO/NO_2/NO_X$), and EN 14212 ($SO_2$) as well as the respective USEPA standards. |
| qualityaustria | The airpointer is produced according to ISO 9001:2008 and is subject to continuous enhancement. |

See www.recordum.com
for a list of distributors

recordum®
Next Generation Environmental Monitoring Solutions