HEALTHY PHOTON

QC Laser-based Sensing Technology

High-precision Gas Analyzers

For Ecological Research

HealthyPhoton Technology Co., Ltd.

HealthyPhoton Technology Co., Ltd., established in 2014, was formerly known as a company that specialized in QC Laser-based products for various applications and services. It is a leading high-tech company in China, seamlessly integrating research and development, production, and sales.

We offer products encompassing fundamental optical sensing modules, complete gas detection systems, data service platforms, and end-user application solutions. These products are extensively utilized in various fields, including scientific research, environmental protection, agriculture ecology, and industry. The company has successfully provided solutions to over 200 customers globally, with a customer base spanning across China and receiving high acclaim from users in countries such as the UK, the USA, and the Netherlands.

Driven By Technological Innovation

The technical team of HealthyPhoton consists of graduates from top universities such as Tsinghua and Princeton University. They possess valuable intellectual property in the field of high-sensitivity and high-speed trace gas molecular spectroscopic analysis, and hold numerous patents across various categories.

Innovation For Green Life

HealthyPhoton aspires to be a world-class provider of spectroscopy analysis products and services. Their vision is to achieve more precise scientific measurements, contributing to the global goal of "carbon neutrality."

APPLICATIONS

Environmental Monitoring

Used for urban air quality monitoring, industrial gas emission detection, and more.

Climate Research

Utilized to collect greenhouse gas concentration data required for climate model research.

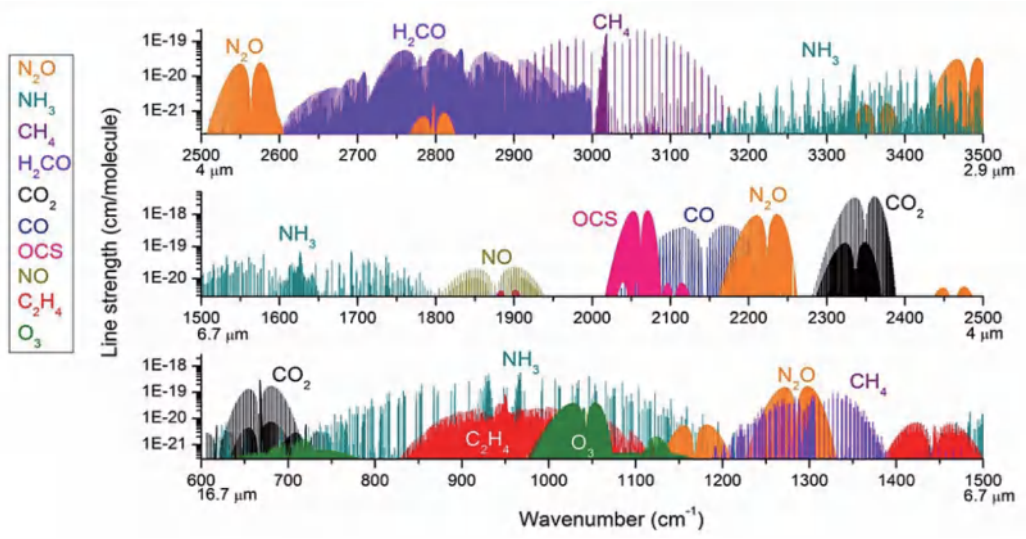
Agriculture Ecology

Employed to monitor greenhouse gas emissions in farmland and gas variations in ecosystems.

Scientific Research

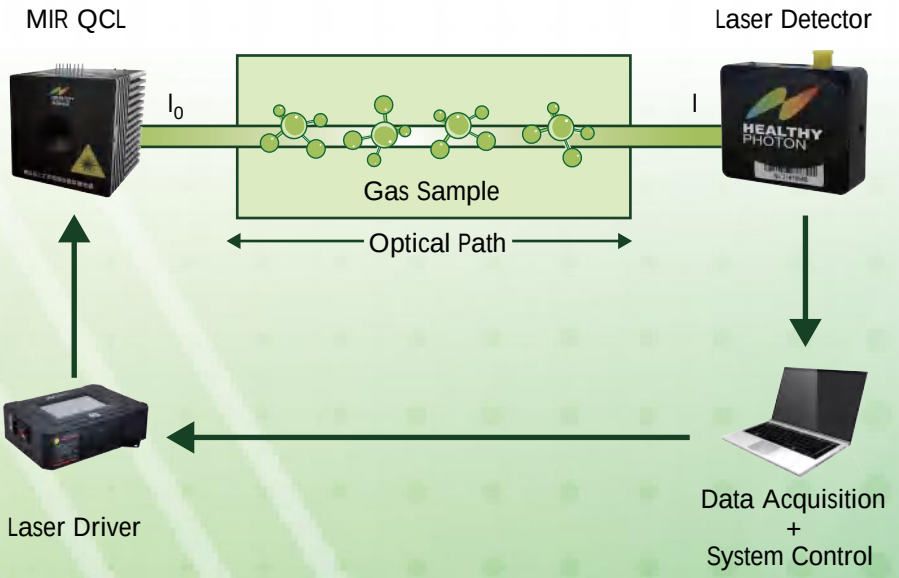
Serves as experimental equipment for research and educational activities.

CORE TECH



QC Laser-based Sensing Technology

Infrared Laser Spectroscopy Detection



- **World-wide service**
- **Immediate response**
- **Worry-free after-sales support**

CONTENT

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HT8800 Series

All-in-one Portable GHG Analyzers

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01/ HT8800 Series

All-in-one
Portable GHG Analyzers

QC Laser-based Hybrid Cavity Absorption Spectroscopy for Multi-component Gas (CO_2, CH_4, N_2O, H_2O) Sensing

HT8800 Series All-in-one Portable GHG Analyzers achieve rapid and high-precision greenhouse gas measurements within a portable instrument case. It employs independent strong absorption spectral lines, eliminating cross-interference from other gas molecules.

Multi-component

Target species: CO_2, CH_4, N_2O, H_2O. Accuracy is ensured by independent and strong absorption spectral lines in the mid-infrared band with no cross-interference.

Reliability

Strong MIR absorption signals of gas molecules eliminate the need for an extremely long optical cavity, resulting in stable optics and highly reliable data.

Portability

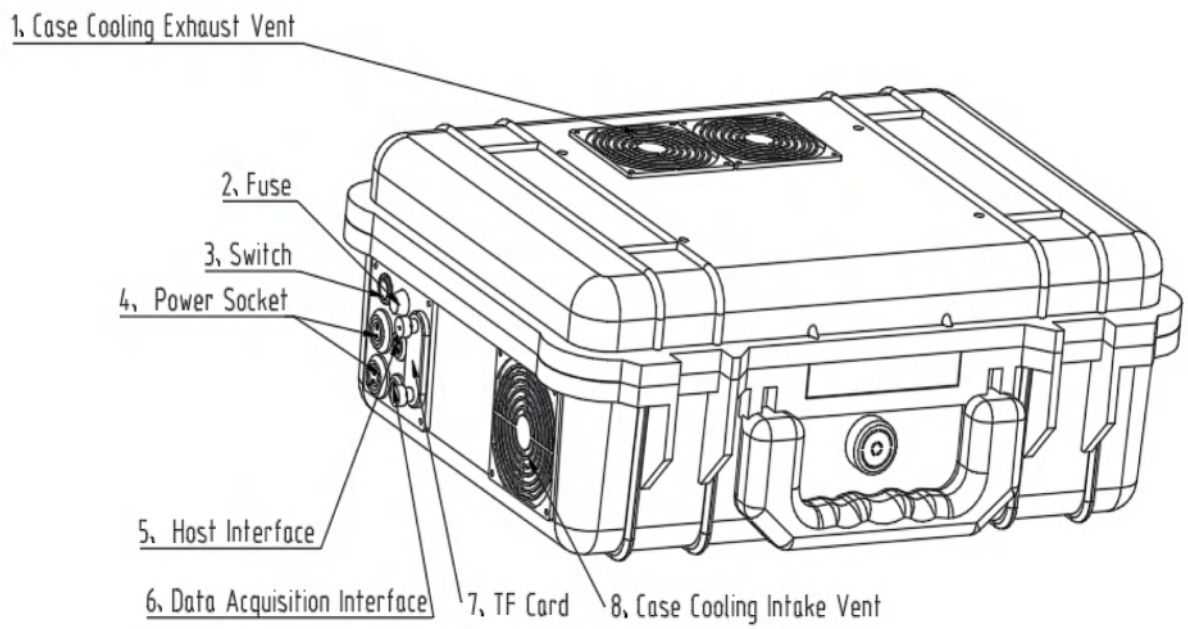
A waterproof, durable, and easy-to-carry casing based on high-strength ABS material.

Low Power Consumption

Less than 100W power consumption that can be powered by solar panels or batteries for continuously uninterrupted operation.

Flexibility

Support fixed-point or vehicle-mounted continuous automatic detection.



SPECIFICATIONS

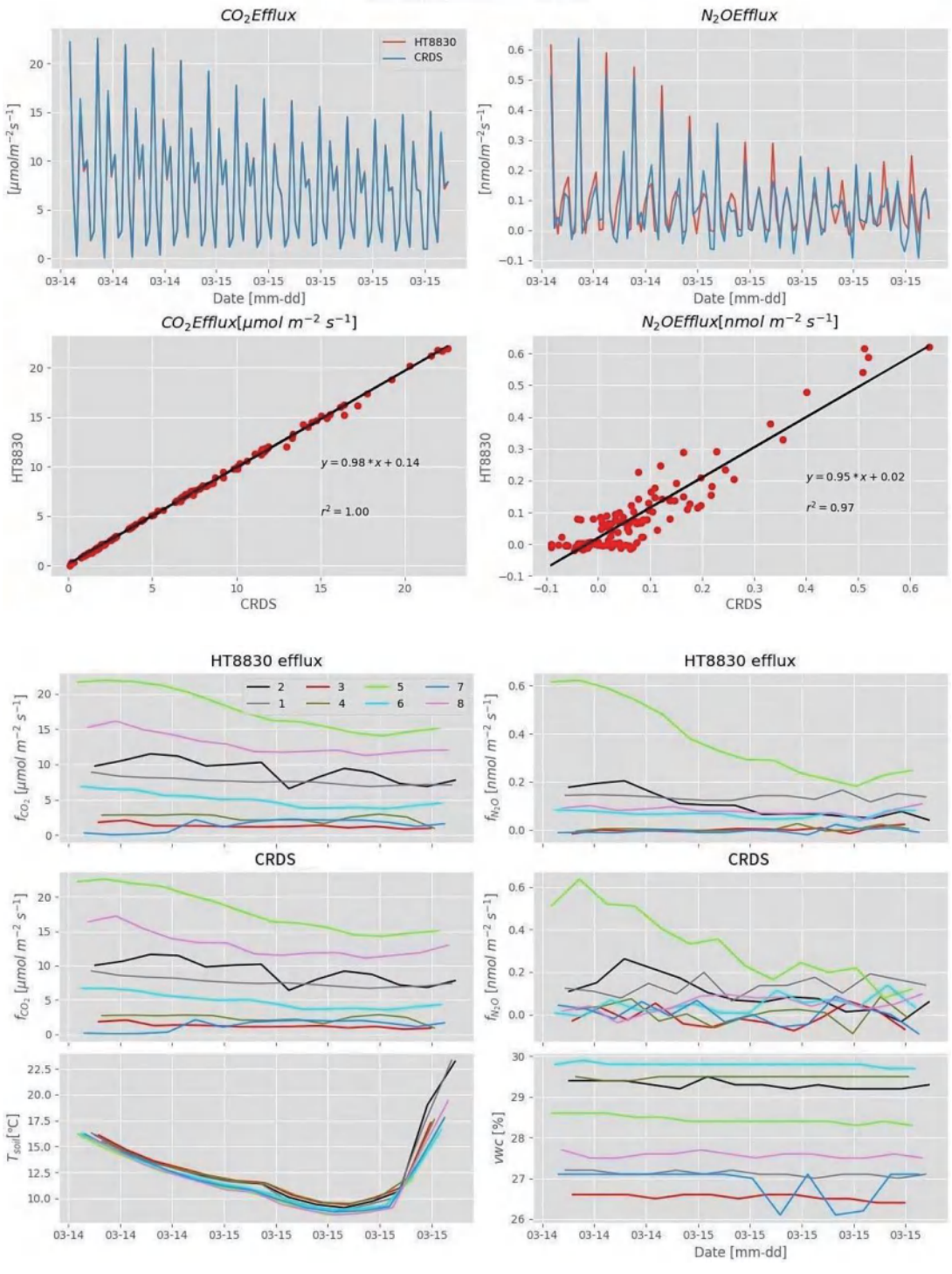
Model	HT8850	HT8840	HT8830	HT8820
	CO_2, CH_4, N_2O, H_2O	CO_2, CH_4, H_2O	CO_2, N_2O, H_2O	CH_4, N_2O, H_2O
Gas	CO_2	CH_4	N_2O	H_2O
Measurement Range	0.02~2 %	0.1~15 ppmv	0.1~5 ppmv	0~3 %（non condensing）
Measurement Accuracy(5s)	＜0.3 ppmv	＜3 ppbv	＜ 0.5 ppbv	＜100 ppmv
Response Time(T90)	＜15 s			
Data Rate	10/1/0.1/0.01 Hz			

PRODUCT PARAMETERS

Operating Temperature	-10°C ~ 45°C
Sampling Pressure	70 ~ 110 kPa
Environmental Relative Humidity (RH)	<99% R.H. non condensing
Data Communication Method	USB / COM / WIFI
Data Storage	Integrated SD card
User Interface	Windows UI on PC / Android UI on Pad
Dimensions	47cm*36cm*20cm
Weight	15 kg
Supply Voltage	24 VDC/5A (max)
Power Consumption	80 ~100 W
Optional Accessories	Soil respiratory chamber, external vacuum pump, vacuum tubing, data logger, rechargeable batteries, shoulder strap, trolley and instrument shipping case.

FIELD DATA

Comparison Between HT8830 and A Commercial CRDS Analyzer In soil Respiration Experiment.



APPLICATION CASES

Tsinghua University-SIGS

Outdoor on-site experiments on soil emissions.

Grassland at Jiangsu Province

Auto soil chambers with MUX, parallel sampling & comparing with CRDS.

Field at Lanzhou Province

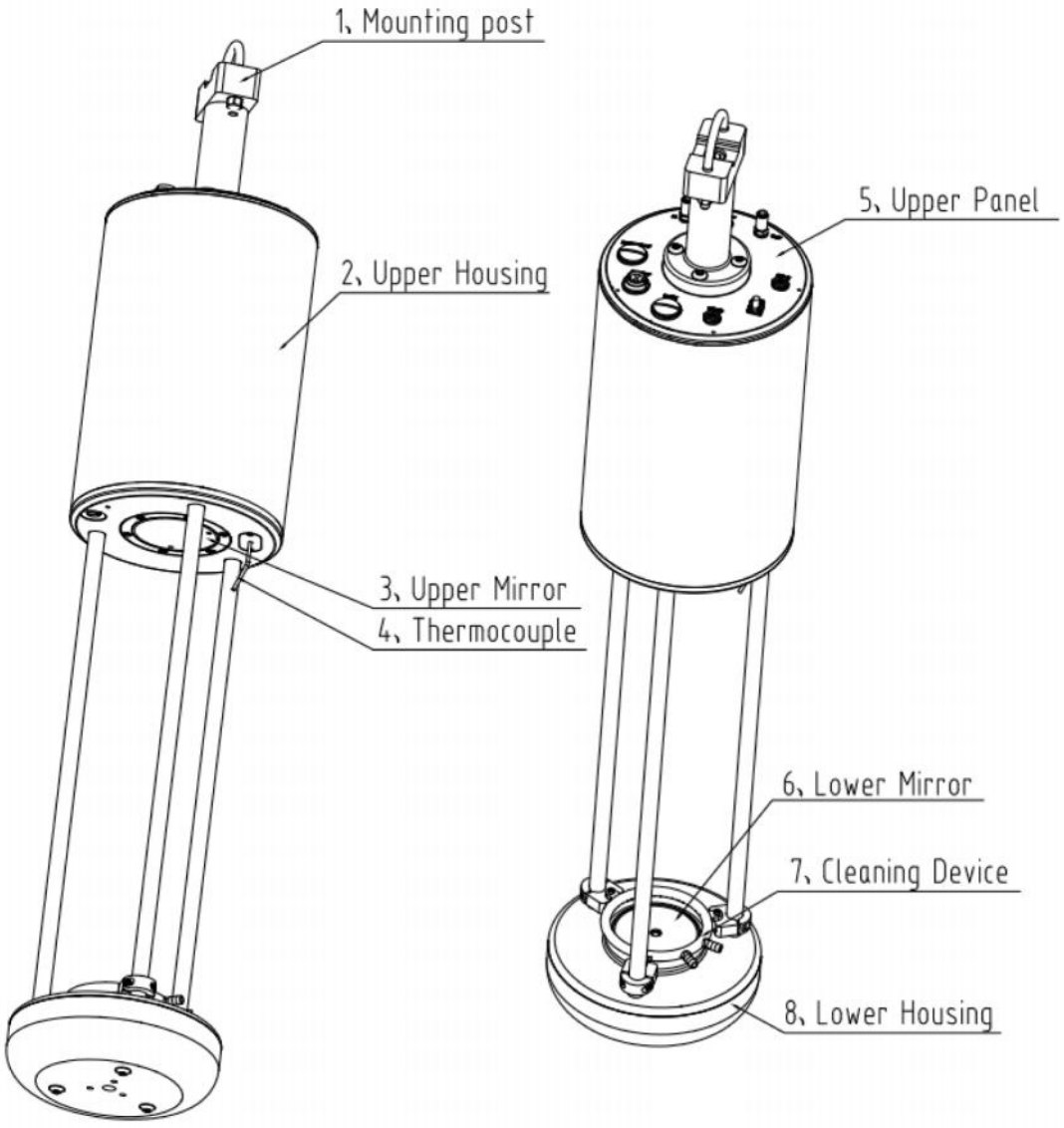
Monitoring of greenhouse gas emissions from soil in the field.

02/HT8700
Open-path NH_3 Analyzer

Revolutionary Open-path Design For Ammonia

HT8700 is an open-path analyzer providing an in-situ measurement of atmospheric ammonia concentrations with high speed, low power consumption, and ultra-high sensitivity. The superior performances make it suitable for deployment in various environments.

- **Ultra-high Sensitivity**
- **Anti-interference Measurement**
- **High Frequency Response**
- **Pipe and Pump Free**
- **Low Power Consumption**
- **Unattended Continuous Monitoring**



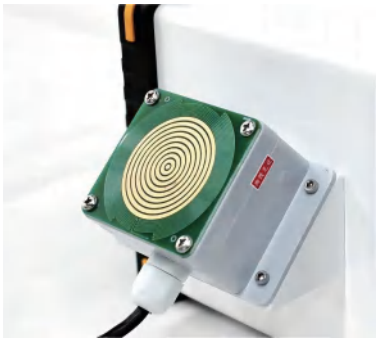
Resolution（1 σ; 0.1s / 1s / 10s）	0.3ppbv / 0.17ppbv / 0.03ppbv
Measurement Range	0 ~ 2000 ppbv（other ranges are optional）
Sampling Rate	10 Hz
Sampling Pressure	70 ~ 110 kPa
Operating Temperature	-10 °C ~ 45 °C
Operating Humidity	< 99% R.H. non condensing
Data Communication	RS-232
Supply Voltage	24VDC / 5A
Power Consumption	50 W（~100 W at warm-up）
Dimensions	1046 mm x Ø196 mm
Weight	<15 kg
Environmental Adaptability	IP67

PRODUCT PARAMETERS

OPTIONAL UPGRADE MODULES

Auto-cleaner

The auto-cleaner system uses water and pressured air to remove the dust from the lower mirror, avoiding routine manual cleaning. A new mirror coating technology ensures corrosion resistance for long-term observation in the field.



Rainfall Sensing

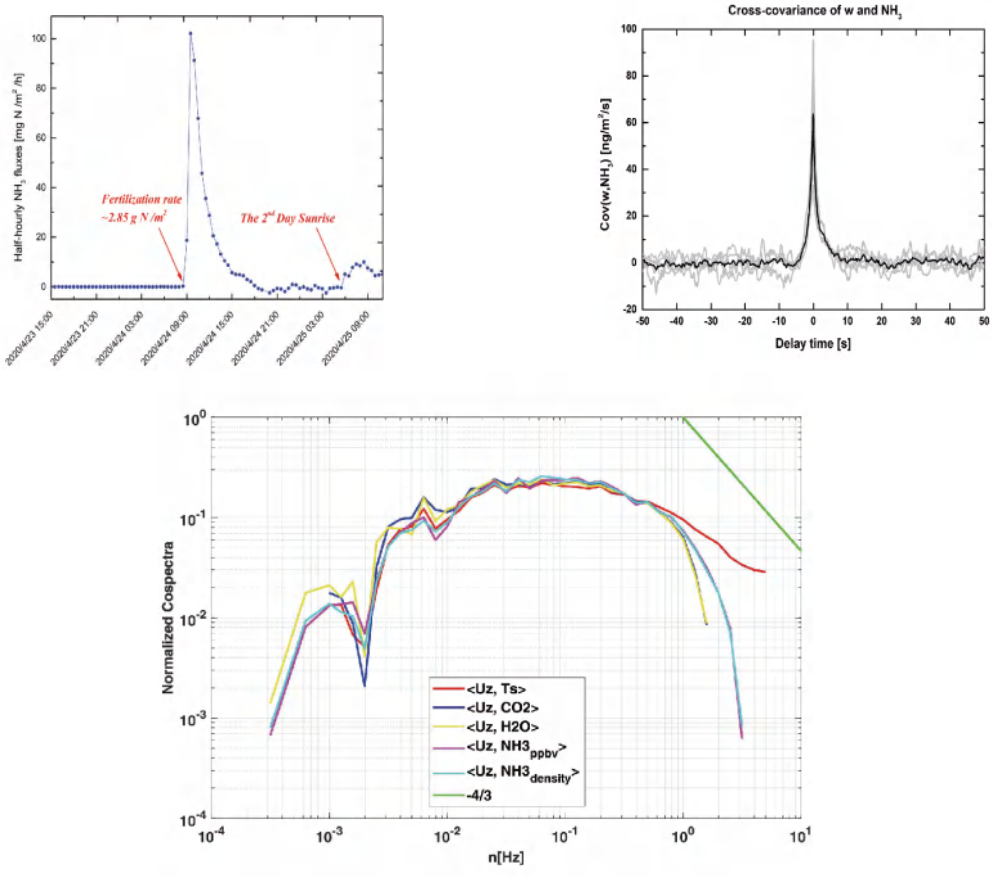
In the case of rainy weather, the data collected by the system becomes invalid. A rainfall detection module has been introduced to address this issue. Through sensing devices, real-time feedback is provided to the system when rainfall is detected. Data collected during rainfall periods will be marked with a special indicator, making it easier for users to filter out valid data.

Mirror Heating

During outdoor operations, rain and low-temperature conditions can lead to water condensation on mirrors, affecting their reflective efficiency. A heating system has been developed to elevate the mirror temperature slightly above ambient temperature. The feature ensures that the mirror reflection rate is quickly recovered after condensation, resulting in more precise and reliable measurements.

EDDY COVARIANCE FLUX MEASUREMENT

Below is an example of NH_3 flux data from a 48-hour continuous measurement during the fallow season at a dry rice paddy in Ningbo, Zhejiang Province, China. The data was acquired with an Eddy covariance system based on the HT8700 and an anemometer. A peak of NH_3 flux was observed after the application of ammonium bicarbonate.

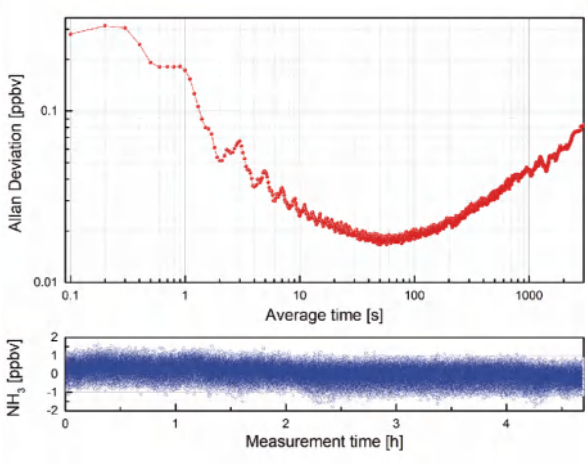


Spectral analysis was performed to study the instrumental performance in the high-frequency range. Note the CO_2/H_2O co-spectra were calculated based on the data from LICOR® LI-7500. Similarly, the NH_3 co-spectra was calculated based on the HT8700 field data without high frequency loss correction.

Institute Of Atmospheric Physics,CAS

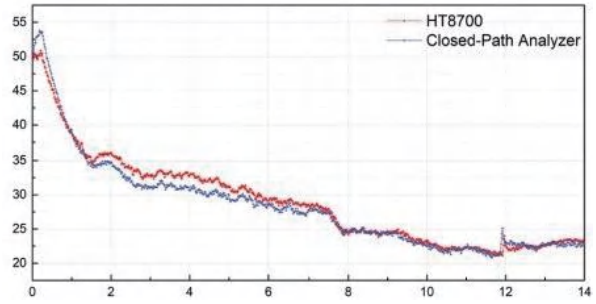
Reference: Wang K.*, Kang P., Lu Y., Zheng X.H., Liu M.M., Lin T.J., Butterbach-Bahl K., Wang Y.*, An open-path ammonia analyzer for eddy covariance flux measurement. Agricultural and Forest Meteorology 308-309:108570, 2021.

VALIDATED PERFORMANCE

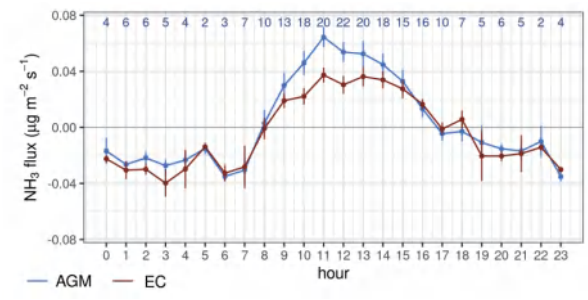


Ultra-high Sensitivity

Allan deviation shows 0.28 ppbv NH_3 detection sensitivity at a 10 Hz sampling.



Trustworthy Accuracy



Reliable Flux Data

AGM: Atmospheric gradient method based on UV-DOAS
EC: Eddy covariance flux based on HT8700

APPLICATION CASES

TNO, The Netherlands

Swart D.et al., Field comparison of two novel open-path instruments that measure dry deposition and emission of ammonia using flux-gradient and eddy covariance methods. Atmospheric Measurement Techniques, 16(2), 529-546, 2023.

China Agricultural University

Wang K.et al., A significant diurnal pattern of ammonia dry deposition to a cropland isdetected by an open-path quantum cascade laser-based eddy covari-ance instrument. Atmospheric Environment, 278, 119070, 2022.

Hubei Academy Of Agricultural Sciences

Long-Term Foundational Monitoring Projects at the National Agricultural Environmental Observation Experiment Station in Qianjiang.

ICOS Site,The Netherlands

Forest canopy NH_3 dry deposition monitoring.

03/ HT8600

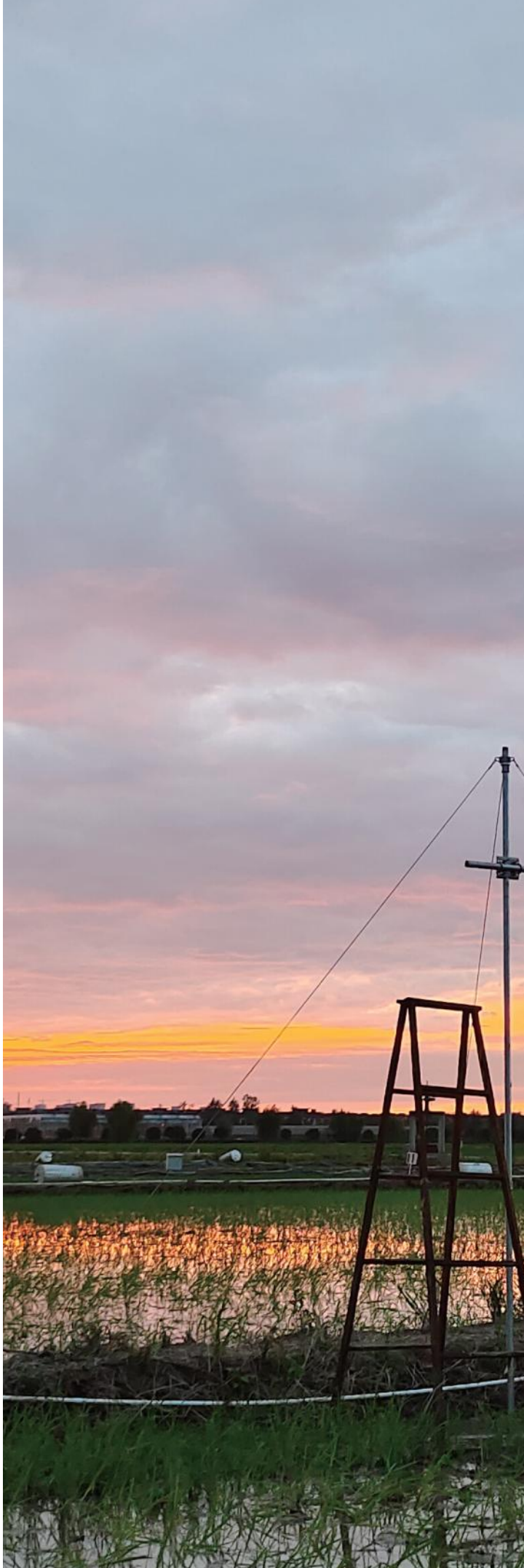
Open-path CH_4 Analyzer

Measuring GHG emissions with eddy covariance.

04/ HT8500

Open-path N_2O Analyzer

Measuring GHG emissions with eddy covariance.



HT-8600

HT-8500

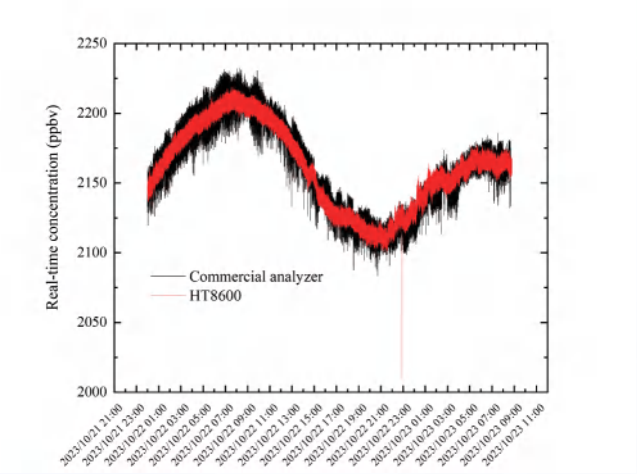
- **Ultra-high Sensitivity**
- **Fast Response**
- **Low Power Consumption**

	HT8500 Open-path N_2O Analyzer	HT8600 Open-path CH_4 Analyzer
Resolution (1 σ; 0.1s / 1s / 10s)	0.2ppbv / 0.07ppbv / 0.02ppbv	2ppbv / 0.7ppbv / 0.2ppbv
Measurement Range	100-5000 ppbv	0.1-15 ppmv
Sampling Rate	10Hz	10Hz
Sampling Pressure	70~110 kPa	70~110 kPa
Operating Temperature	-10℃~45℃	-10℃~45℃
Operating Humidity	< 99% R.H. non condensing	< 99% R.H. non condensing
Data Communication	RS-232	RS-232
Supply Voltages	24VDC / 5A	12VDC / 5A
Power Consumption	50W (~ 100W at warm-up)	30W(60W at warm-up)
Dimensions	1024mm×Ø196mm	1024mm×Ø196mm
Weight	<15kg	<15kg
Environmental Adaptability	IP67	IP67

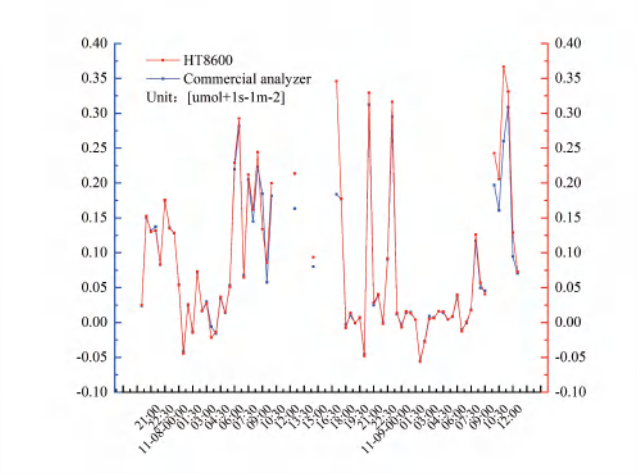
PRODUCT PARAMETERS

FIELD DATA

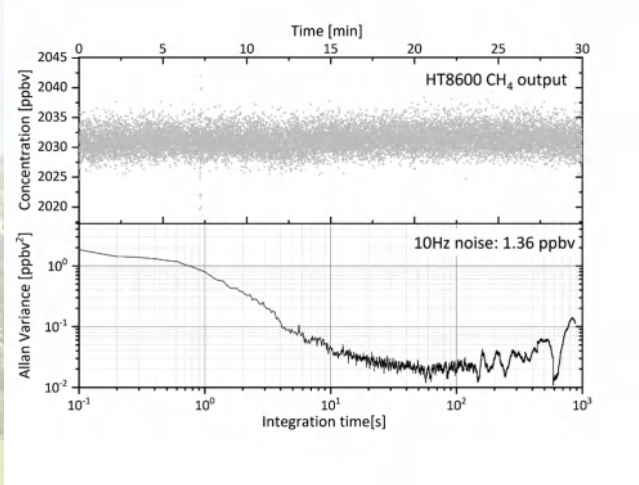
Comparison between HT8600 and A Commercial Open-path Analyzer



Concentration comparison



Flux comparison



Noise Evaluation

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