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Monitored by



Assisting Industrial for Better Environmental

Improve Efficiency Through Capital Environment in New Technology

EXECUTIVE SUMMARY

The industrial and energy sectors are under enormous pressure to reduce emissions and comply with environmental regulations. Governments and environmental organizations are taking serious action to try to reduce emissions in some industries through regulations. In 2018, the Ministry of Environment and Forestry of the Republic of Indonesia (KLHK) conducted a regulatory review to regulate and monitor industrial exhaust emissions pollution through a series of PERPUs with environmental laws.

And WHY is CEMS & AQMS INTEGRATION NECESSARY?

“Article 203 paragraph (6) Republic of Indonesia Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management, every person responsible for businesses and/or activities that carry out automatic and continuous monitoring needs to integrate their emissions monitoring into the industrial emissions monitoring information system as a whole. Continuously.”

“Article 2 paragraph (1) Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 13 of 2021 concerning Information Systems for Continuous Industrial Emission Monitoring, every business and/or activity that is required to carry out emissions monitoring using CEMS is required to integrate its Emissions monitoring into SISPEK.”

Green policies have also forced major polluting industries, such as iron and steel smelting, pulp & paper, rayon, carbon black, oil and gas, mining, thermal waste processing, cement, thermal power plants, fertilizer, and ammonium nitrate. to measure and monitor emissions more accurately and continuously by worldwide regulations such as [US.EPA part 60/75, EN 17255](#).

In general, the main parameters that must be monitored by CEMS tools include Particulates (PM), Nitrogen Oxide (NO_x), Sulfur Dioxide (SO₂), Mercury (Hg), Hydrogen Chloride (HCl), Hydrogen Sulfide (H₂S), Hydrogen Fluoride (HF), Ammonia (NH₃), Carbon Monoxide (CO) and supporting parameters such as Carbon Dioxide (CO₂), Oxygen (O₂), Temperature, Flow Rate. Adjusted to the Emission Quality Standards of each industry at the emission source. From a plant owner's perspective, it's important that efficient and reliable tools for acquiring emission data are available to avoid costly penalties and plant shutdowns.

In addition to monitoring tools that use CEMS on emission sources in each industry. Air pollution monitoring was also carried out using the AQMS tool to determine the environmental air quality conditions that have the most impact on human health. The data displayed are critical value of parameters, humidity value, air pressure value, temperature, and parameter graph. The parameters used in the calculation of the Standard Air Pollutant Index (ISPU) to date are Particulate Matter (PM_{10} and $PM_{2.5}$), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Ozone (O₃), and Hydrocarbons (HC)

“Article 6 paragraph (1) Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 14 of 2020 concerning Air Pollution Standard Index (ISPU) which is a replacement for the Decree of the Minister of Environment No. 45 of 1997 concerning Calculation and Reporting as well as Information on Air Pollution Standard Index.”

It's emphasized that the ISPU calculation as referred to in Article 4 and Article 5 is carried out every 1 (one) hour from the 24 (twenty-four) hour monitoring data continuously.” In this replacement regulation, it is stated that the calculation of the ISPU is carried out on 7 (seven) parameters, namely PM₁₀, PM_{2,5}, NO₂, SO₂, CO, O₃, and HC. There are 2 (two) additional parameters, namely HC and PM_{2,5} from the previous regulation. The addition of these parameters is based on the magnitude of the risk of HC and PM_{2,5} to human health.

Tabel comparison of PM_{2,5} quality standards in several countries

No	Negara	Baku Mutu µg/m ³
-	WHO Guideline	10
1	Australia	8
2	Singapura, Amerika Serikat (primary)	12
3	Indonesia , Korea Selatan, Bangladesh, China Grade I, Jepang, Pakistan, Amerika Serikat (secondary)	15
4	Mongolia, Filipina, Sri Lanka, Thailand, Vietnam	25
5	China Grad II, Malaysia	35
6	India	40


REGULATORY REFERENCE

Air pollution is one of the biggest problems faced today. To meet the requirements and standards, it's essential to measure the emissions. But how do you know what your smokestack is releasing into the atmosphere? That is a big challenge for many companies. Based on those facts, Indonesian Government through The Ministry of Environment and Forestry (KLHK) issuing several regulations to control and manage the environment sustainability

1. [PERATURAN MENTERI LHK NOMOR 1 TAHUN 2021 TENTANG PROGRAM PENILAIAN PERINGKAT KINERJA PERUSAHAAN DALAM PENGELOLAAN LINGKUNGAN HIDUP](#)
2. [PERATURAN MENTERI LHK RI NO. 13 TAHUN 2021 TENTANG SISTEM INFORMASI PEMANTAUAN EMISI INDUSTRI SECARA TERUS MENERUS](#)
3. [PERATURAN PEMERINTAH RI NO. 22 TAHUN 2021 TENTANG PENYELENGGARAAN PERLINDUNGAN DAN PENGELOLAAN LINGKUNGAN HIDUP](#)
4. [PERATURAN MENTERI LHK RI NO. 5 TAHUN 2021 TENTANG TATA CARA PENERBITAN PERSETUJUAN TEKNIS DAN SURAT KELAYAKAN OPERASIONAL BIDANG PENGENDALIAN PENCEMARAN LINGKUNGAN](#)
5. [KEPUTUSAN KEPALA BAPEDAL NO. 205 TAHUN 1996 TENTANG PEDOMAN TEKNIS PENGENDALIAN PENCEMARAN UDARA SUMBER TIDAK BERGERAK](#)
6. [OTHER REGULATIONS RELATED TO AND APPLICABLE IN THE REPUBLIC OF INDONESIA](#)

WHO WE ARE

Choosing your environmental technology and ecosystem partner is like hiring a contractor to build your house. Your environmental technology and ecosystem partner will decide on your success or failure; therefore, choose wisely.

Effective Communication, at  , we highly believe in the chemistry of the relationship. That's why we value extensive transparent communication with our clients, vendors, and partners.

Mix & Match Expertise, we have the right people who possess the organizing skills and expertise that fits and shape your goals. Our technology supports past experience simply shapes who we are today.



Focus on
Achieving Target



Connected
Platform



Wide Cluster
Network



Global
Compliance



Integrated
Operations



Controlled
Process



Guaranteed
Mechanism



Cost
Efficiency



OUR COMPETENCY

We've developed **competencies orchestra** as the function ecosystem network on entity resources to ensure your needs meets the precise execution handling with the excellences.

Continuous Emission Monitoring System (CEMS)	Ambien Air Quality Monitoring System (AQMS)
Feasibility Study Sampling Probe and Location CEMS	AQMS Equipment
CEMS Equipment	Implementation of AQMS Network
Programming Data Acquisition System (DAS) & Data Interfacing System (DIS)	AQMS Network Management
Audit Test (RCA, CGA, RATA)	Air Quality Experts
Services and Maintenance	Services and Maintenance

Connecting the Dots, we are driving the ecosystem to bring the



linkage of supply and demand process without exception financing in the middle. Our ecosystem comes with the goal of connecting everything so that clients can connect everything around them with **technology, data, machines & parts, measurable process, and accurate laboratory** as much as possible.

IoT & ENGINEERING

Specification:

- Assessment
- Installation
- Maintenance
- Infrastructure

LABORATORY

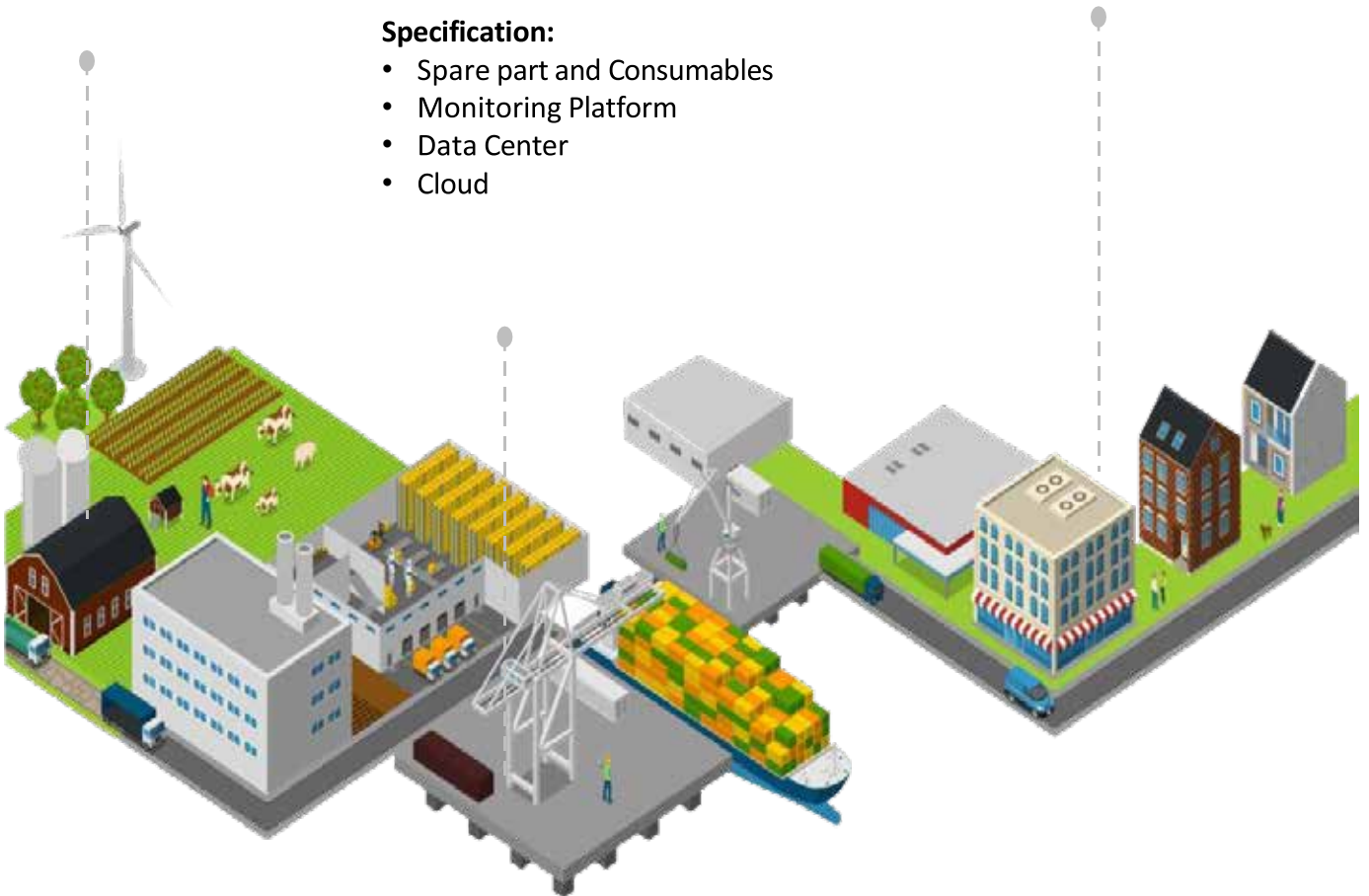
Specification:

- Technical Study of Air Emissions (Cyclonic Flow Velocity Test)
- Cylinder Gas Audit (CGA)
- Response Correlation Audit (RCA)
- Relative Accuracy Test Audit (RATA)

DATA & MANUFACTURE

Specification:

- Spare part and Consumables
- Monitoring Platform
- Data Center
- Cloud





IoT & ENGINEERING

AQMS SOLUTIONS

The development of the development sector, both small and large-scale, in Indonesia which directly increases per capita income and participates in to be a driver of progress for the community in the Indonesian region. The increasing number of industries has a negative impact on the environment, one of which is increasing the amount of air pollution produced, causing the risk of upper respiratory tract infections (URTI/ISPA).

One of the steps that must be taken to minimize this impact is to carry out continuous monitoring of ambient air quality which has been mandated in Government Regulation number 22 of 2021 concerning the Implementation and Management of the Environment Live.

AQMS (Air Quality Monitoring System) is a monitoring tool specifically designed to measure and record air quality in real time. The ambient air quality parameter data includes particulates, gases, hydrocarbons and BMKG data such as wind direction, wind speed, humidity, rainfall and temperature.

RESUME OUR PRODUCT AIR QUALITY MONITORING SYSTEM

PRODUCT NAME	NEXT GEN SMART	POLLUDRONE (OIZOM)	KUNAK	BETTAIR
Parameter of Air Quality Monitoring based on attachment VII Republic of Indonesia Government Regulation Number 22 of 2021	Yes	Yes	Yes	Yes
Parameter of Climatology based on Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 14 of 2020	Yes	Yes	Yes	Yes
Power Supply (*External AC/DC, Batteries, Solar Panel)	Yes	Yes	Yes	Yes
Display Data (On site monitoring via display monitoring web & application)	Yes	Yes	Yes	Yes
Compact install within 30 minutes and the dimensions of the product do not take up a large space	-	Yes	Yes	Yes
Mobile AQMS	Yes			Yes

**Latest state of the art technology, efficient & less maintenance requirements, higher reliability and durability, remote access and maintenance, lower carbon footprint*



CHALLENGES IN AIR QUALITY AND AMBIENT MONITORING

In the mandate of Government Regulation Number 22 of 2021, it is stated that every industry that has environmental documents and produces indirect emission sources is required to monitor air quality continuously. This found several obstacles including:

SCOPE OF MONITORING



The wide scope of monitoring presents a major challenge in testing ambient air quality manually using an impinger system (*is an air sampling tool used to identify the concentration of certain substances in the form of liquids dispersed in the air) related to the need for mobilization and demobilization of sampling so that the need for manual sampling costs becomes large

COMPREHENSIVE DATA



Ambient air quality monitoring requires comprehensive data on various particulate matter, gas and hydrocarbon test parameters. There are still many manual samplings test services that have not been accredited, providing a disadvantage for companies in monitoring and providing an overview of air quality for the surrounding community

MITIGATION OF AIR QUALITY DISTRIBUTION RISK



Companies that release indirect emission sources where the location of activities are close to community areas need real-time data and BMKG supporting data to mitigate risks in terms of optimal measurement and control for the diseases caused. Monitoring ambient air quality which is only carried out once every six months manually provides losses due to data processing that is not fast so that it has an impact on the cause of unrest for the community, on the other hand for the fulfillment of environmental regulations by companies is a weakness because it is the basis for environmental agencies to take action if violations of ambient air quality standard parameters are found.

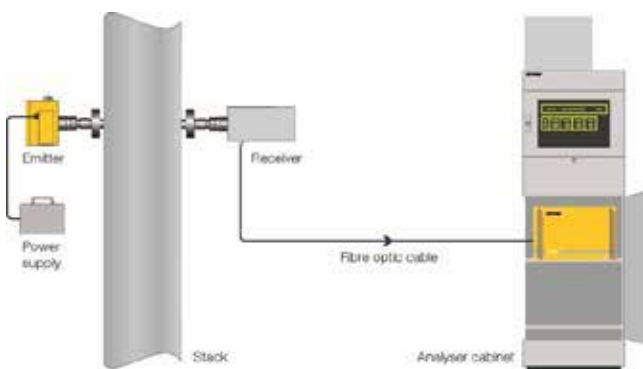
ONLINE AIR QUALITY MONITORING (AQMS)



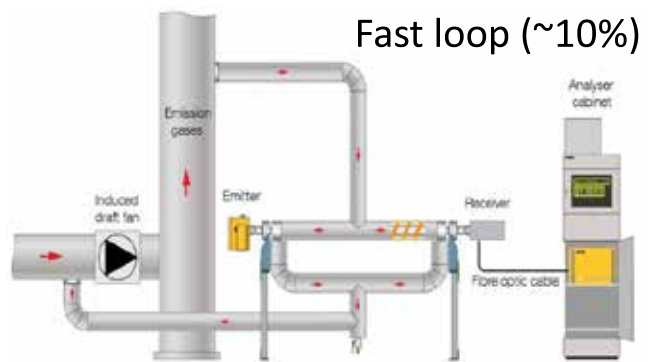
CEMS SOLUTIONS

With decades of industrial experience, our systems are designed and developed as a complete turnkey solution. From sample extraction, through analysis, data acquisition and report management, each system is configured to comply to the normative demands and technical constraints of our clients, regardless of the industrial domain:

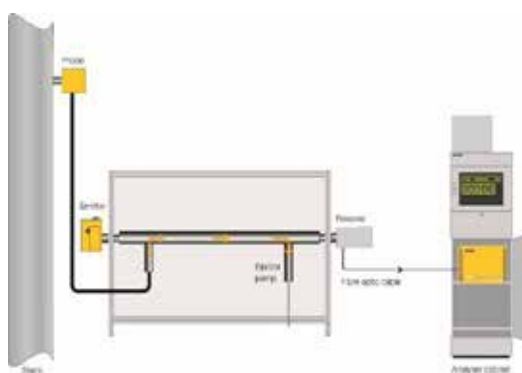
- Aluminium smelters
- Brick plants
- Cement industry
- Chemical industry
- Fertilizer production
- Glass manufacturing industries
- Hg monitoring
- Mineral wool production
- Palm oil plants
- Power plants
- Refineries
- Steel plants
- Sulfuric acid production
- Waste incinerator



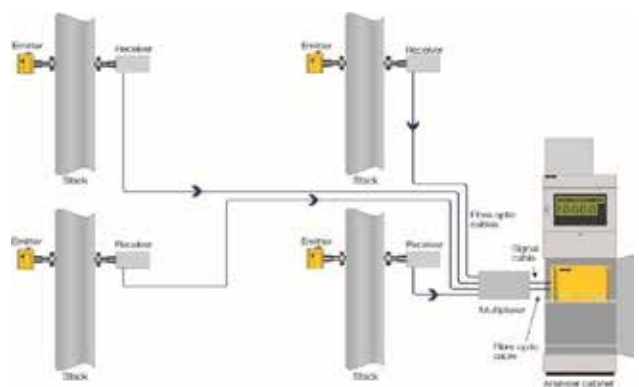
Cross-stack in-situ (~85%)



Fast loop (~10%)



Hot-wet-extractive (~5%)



Multi-path application

- ✓ Reduced cost
- ✓ Reduced maintenance
- ✓ Reduced calibrations
- ✓ Suitable for DeSOx, DeNOx

RETURN ON INVESTMENT

The cost of investing in an OPSIS gas monitoring system is small compared to what can

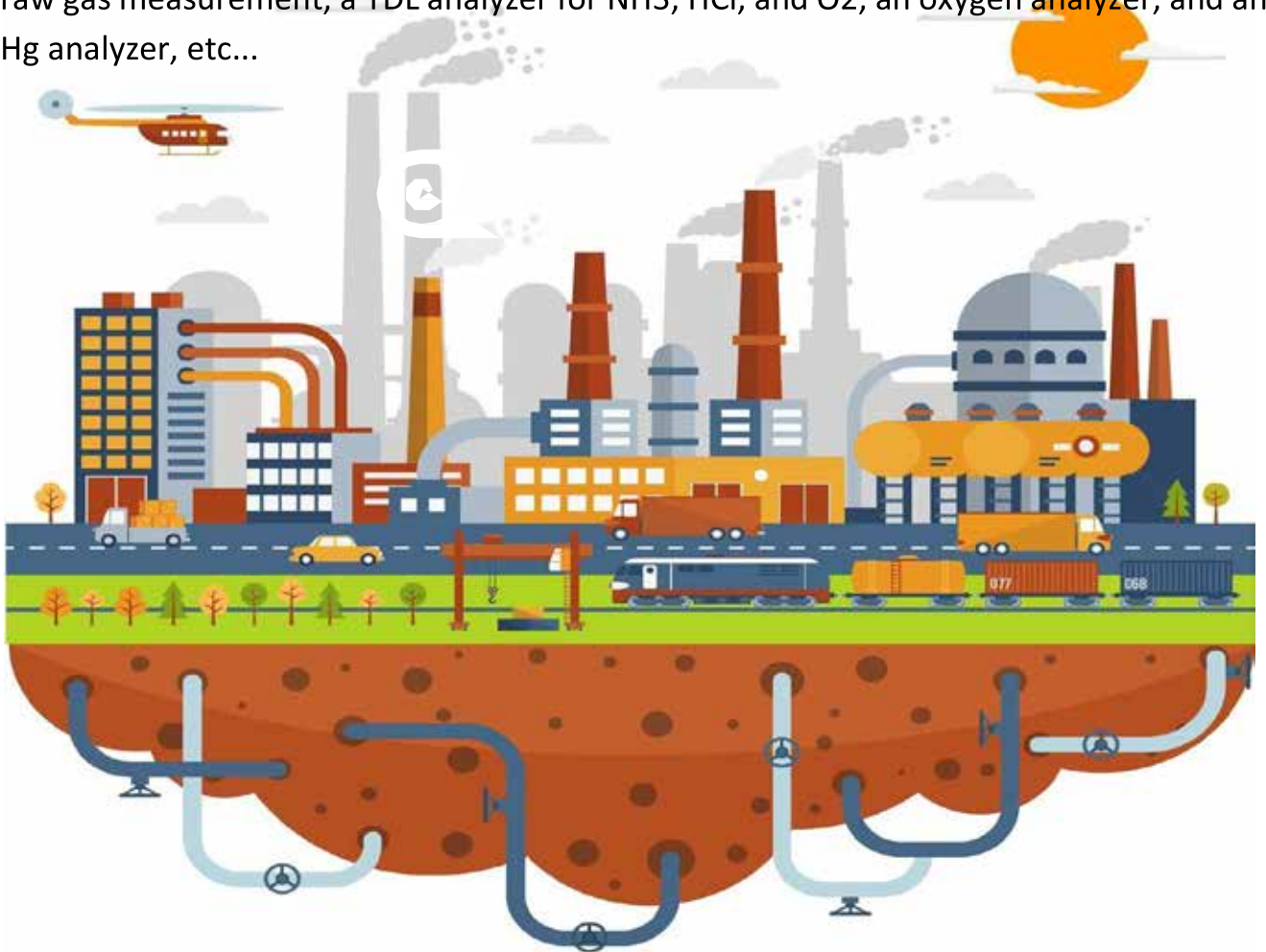
be spent maintaining other types of systems. OPSIS systems have a low total cost of ownership based on multiple moving parts, long intervals between calibrations, ease of operation and low energy consumption.

TEST AND APPROVAL

The OPSIS AB system has been tested and approved by a number of internationally recognized institutions and authorities. The system meets the European directives for waste incinerators and is approved in accordance with EN 15267. The OPSIS system meets the requirements among others provided by the US. EPA

OPSIS PRODUCT PORTFOLIO

OPSIS has a complete product portfolio for gas measurement in a wide range of applications. It includes a complete CEM system with reporting, a process analyzer for raw gas measurement, a TDL analyzer for NH₃, HCl, and O₂, an oxygen analyzer, and an Hg analyzer, etc...



Measurement Uncertainty Based on TÜV QAL1

Parameter	Unit	Certification range*	Ref. for RTEU calc.*	Relative total expanded uncertainty at reference concentration (often but not always stated as Emission Limit Value, ELV, in certificate), in %							EN 15267-3 Requirement
				OP SIS (1)(2)(3)	SICK (4)(5)	Gasmet (6)	MKS (7)	ABB (8)	2010/75/EU, 2000/76/EC Requirement		
SO ₂	mg/m ³	0-75	50**	5.2	10.5	9.2	7.0	9.4	20.0	15.0	
NO ₂	mg/m ³	0-20	20	4.8	10.6	6.7	4.3	9.6	20.0	15.0	
NO	mg/m ³	0-150	100**	4.5	9.5	5.6	6.8	4.8	20.0	15.0	
NH ₃	mg/m ³	0-10	10**	5.5	6.4	9.3	6.2	17.3	-	30.0	
CO	mg/m ³	0-75	50**	5.8	8.7	6.5	6.2	4.3	10.0	7.5	
H ₂ O	vol-%	0-30	30	4.1	5.7	6.0	3.4	4.2	-	7.5	
HCl	mg/m ³	0-15	10**	6.4	12.2	11.3	8.4	8.6	40.0	30.0	
HF	mg/m ³	0-3	1**	18.5	30.3	19.4	19.4	18.0	40.0	30.0	
THg	µg/m ³	0-45	30**	7.8	(2,3)	-	-	-	40.0	30.0	
CH ₄	mg/m ³	0-20	20	5.5	15.6	4.1	7.5	5.2	-	22.5	
CO ₂	vol-%	0-25	25	2.6	6.7	5.2	3.3	3.1	10.0	7.5	

Green background: Objectively lowest uncertainty.

Light green background: Non-unified range and/or ELV. Subjectively lowest uncertainty, taking certified range and chosen reference (ELV) for RTEU into account.

Data from qal1.de per May 30, 2016.

Certificate references:

1) 040333_02 / 30 April 2015 (AR6022/N, AR6022/99)
 2) 038495_04 / 05 March 2018 (AR650/N)

*) Unless otherwise stated in cell comment.

3) 043525_01 / 25 April 2016 (AR650/NHF)

4) 025926_04 / 2 Feb 2015 (MCS 100 FT)

5) 035015_03 / 28 Feb 2017 (MERCEN200Z)

***) Stated as "ELV"

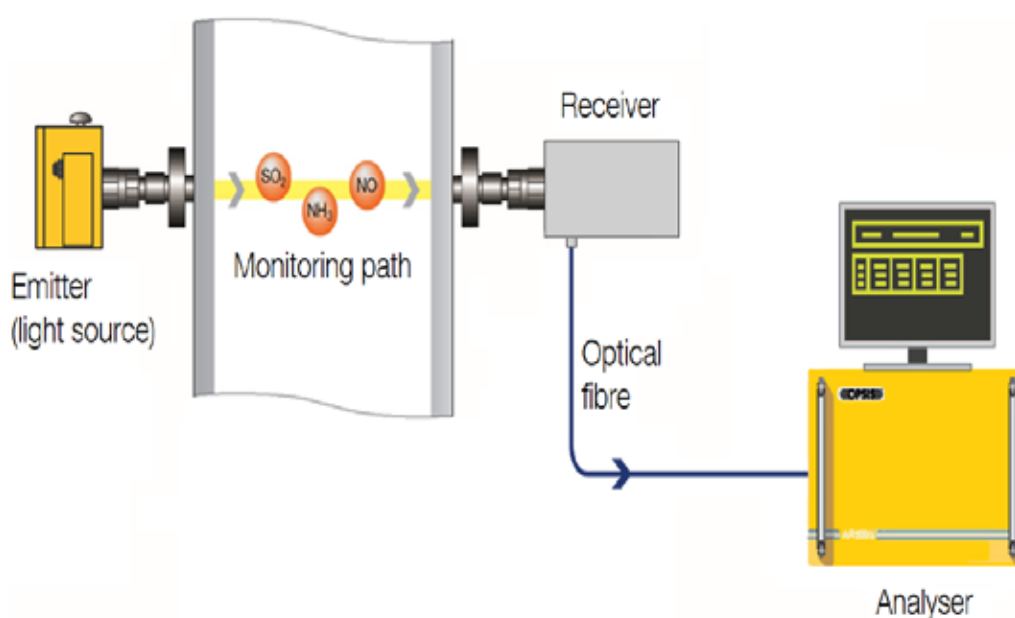
6) 001013_05 / 25 April 2017 (CEMS II e)

7) 039319_02 / 9 Sept 2014 (MGS 300)

8) 053802_01 / 8 Sept 2017 (ACF 5000)

<http://www.qal1.de/en>

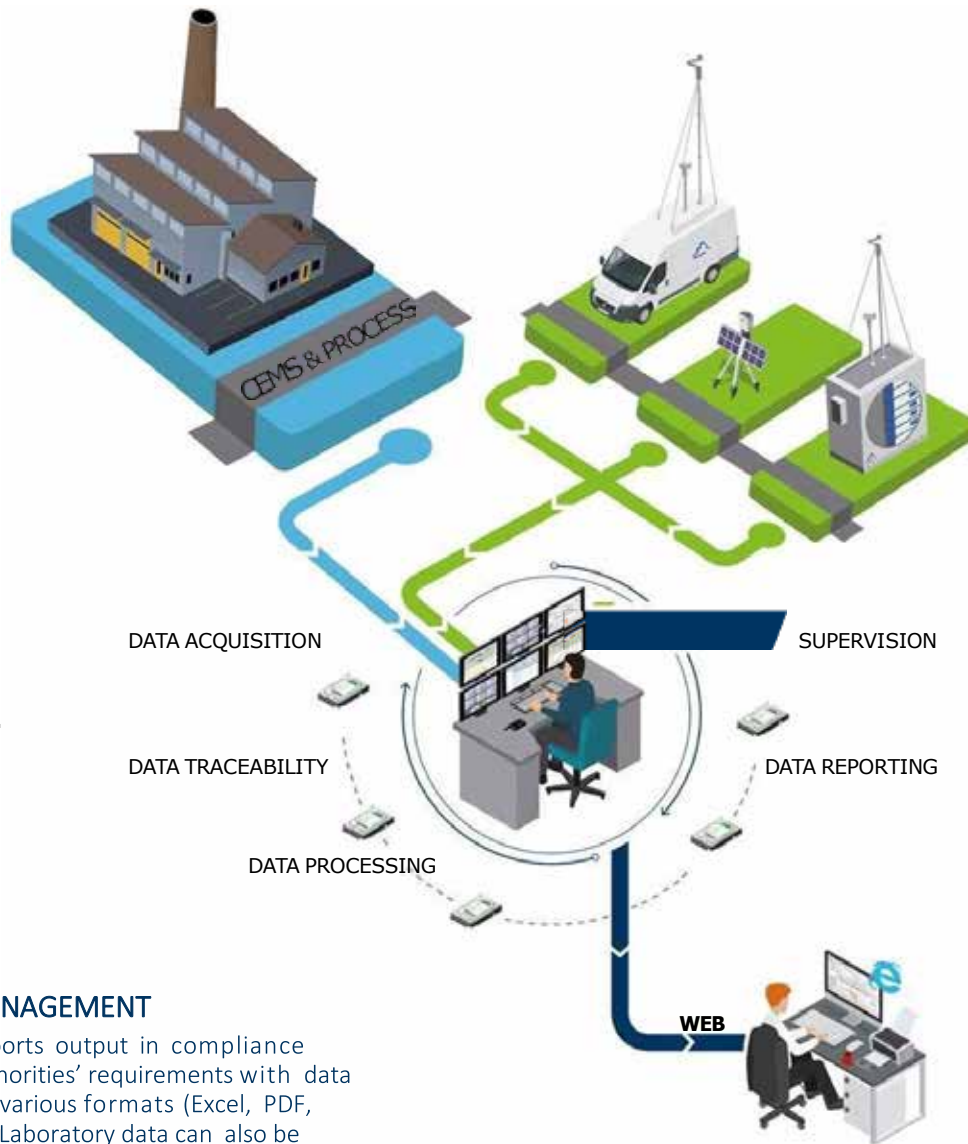
OP SIS NON-CONTACT, NO SAMPLING CROSS-STACK SOLUTION





DATA & MANUFACTURE

INTEGRATION HANDLING



REPORT MANAGEMENT

Automatic reports output in compliance with local authorities' requirements with data exportation in various formats (Excel, PDF, HTML, CSV...). Laboratory data can also be imported into the software.

DATA TRACEABILITY

Each data is controlled, and a qualification code is given to each data according to the conditions of measurement. There is total traceability of data & actions (no loss of raw, validated, invalidated, and corrected data).

All data is stored before & after correction and validation.

SUPERVISION

Follow-up & control of all measuring devices (data acquisition systems and communication systems) with multi-window representation for data display (raw, means, trends, graphs...), real-time graphic follow-ups, interactive set-up, calibration & automatic results monitoring, remote testing of interfaces, etc....

Alerts are given on various events (defaults, alarms, maintenance...).

Implementing transparent information and transforming measurable data usage, we participate in developing the SISPEK KLHK. Together with the DITPPU of the Ministry of Environment and Forestry, we are laying the basic foundation for the development of a web-based system which is currently used as the main tool for monitoring industrial emissions which is connected in real time to the server of the Ministry of Environment and Forestry.

Proper Monitoring





LABORATORY

LABORATORY

Based on government regulation **22** of **2021**, every person in charge of a business and or activity that is required to carry out automatic and continuous monitoring, must integrate monitoring of its emissions into the Environmental Information System



ENVIRONMENTAL LABORATORY THAT HAS BEEN ACCREDITED BY KAN AND REGISTERED WITH THE MINISTRY OF ENVIRONMENT & FORESTRY

The company's progress cannot be separated from three main factors: focusing on quality and customer satisfaction, sustainable human resource development, and making environmental sustainability, health, and safety a priority.

The National Accreditation Body (KAN) has accredited our partner Laboratory as a Testing and Calibration Laboratory according to SNI ISO/IEC 17025:2017. Our partner Laboratory has also been certified as an Occupational Health and Safety Service Provider by the Ministry of Manpower and recognized as an Environmental Laboratory by the Ministry of Environment and Forestry.

Apart from being supported by competent and experienced Human Resources in their fields, our partner Laboratory also has sophisticated laboratory equipment and instrumentation to meet the challenges of the need for Laboratory Analysis Services in Indonesia.

SERVICE COVERAGE



SULAWESI

SEMEN TONASA, SEMEN BOSOWA, PLTG MALEO, DONGGI SENORO LNG, ANTAM POMALAA, VIRTUE DRAGON NICKEL INDUSTRY, MERDEKA TSINGSHANG INDONESIA, PLTMG LUWUK, HARITA GROUP (PT. HALMAHERA JAYA FERONICKEL)



JAWA & BALI-LOMBOK-NTT

PUPUK KUJANG CIKAMPEK, PETROKIMIA GRESIK, PLTU SURALAYA, PAITON OPERATION MAINTENANCE INDONESIA, JAWA POWER, PLTGU CILEGON, ASAHIMAS CHEMICAL, CIREBON ELECTRIC POWER, PLTU BATANG, PLTGU JAWA SATU POWER, SBI NAROGONG-TUBAN-CILACAP, PLTMG MUARAKARANG, PLTMG SUMBAWA BIMA, ASPEX KUMBONG, AMMAN MINERAL



SUMATERA & KALIMANTAN

PLTU PULANG PISAU, PLTU PANGKALAN SUSU, PERTAMINA RU II – DUMAI, PLTU TELUK BALIKPAPAN, PLTU ASAM – ASAM, PLTU BENGKAYANG, PLTU TELUK SIRIH, PLTU LABUAN ANGIN

HAPPY CLIENTS



TECHNOLOGY PARTNER





THANK YOU

For further information, please contact us:

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