

Emission Monitoring

Only the one who is able to precisely measure emissions is prepared for the future.

DURAG **DURAG SEA**



DURAG  **SIENA**

Hegwein

 **SMITSVONK®**



Indonesia's Sole Agent: **PT. Putera Instrumenindo**

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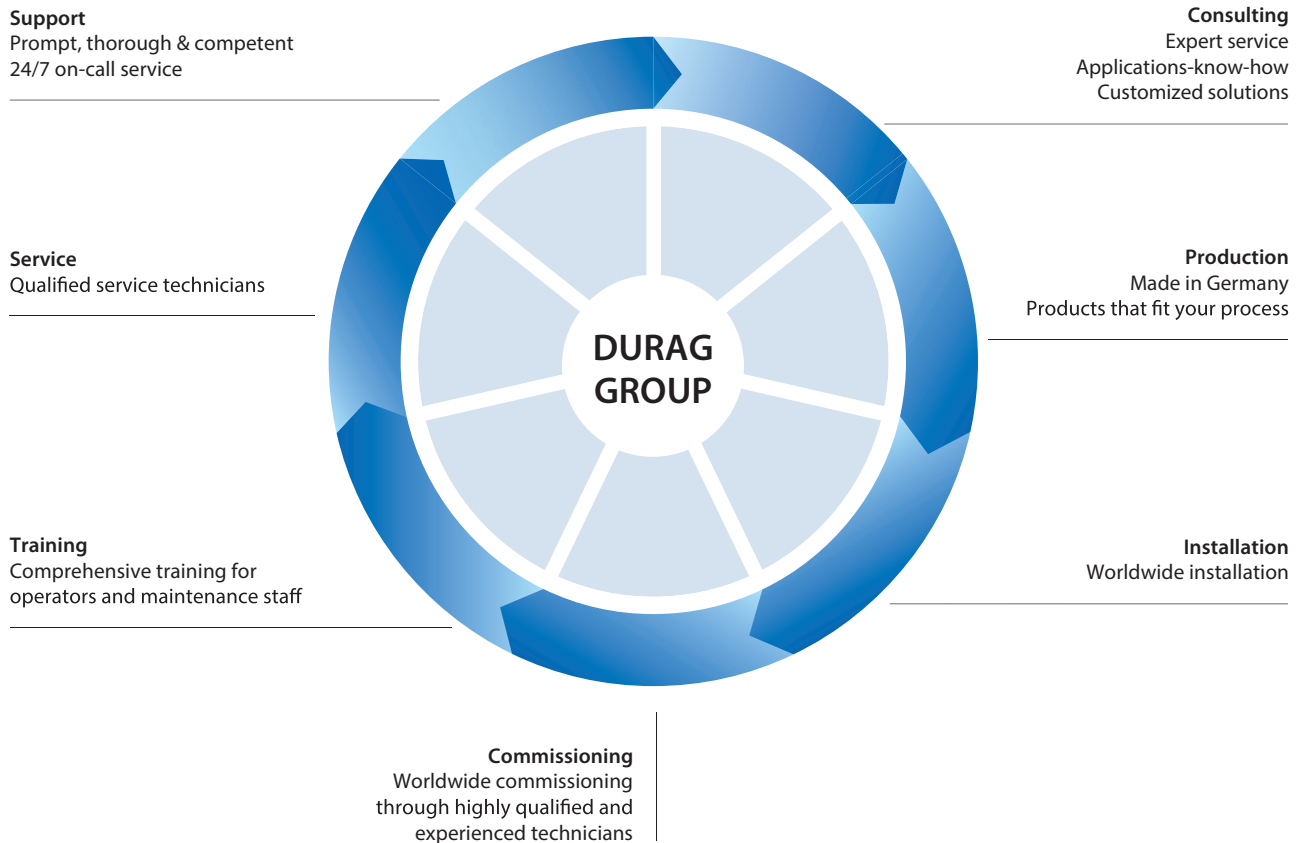
1 | DURAG GROUP

The DURAG GROUP is a market leader for intelligent solutions in combustion technology, emission and ambient air monitoring, multigas analysis, tunnel sensors as well as environmental and process data management. With around 500 specialists, we offer modern technology, certified instruments, and reliable services for the individual requirements of our customers around the world.

As a family owned company we hold ourselves to the highest standards in the development and manufacturing of our products. Our staff have extremely deep knowledge, and develop our products and solutions with innovative ideas.

Our services

- We offer a comprehensive product portfolio for industrial combustion and flame control technology, the visualization and online analysis of thermal processes, gas analysis, as well as the measurement and analysis of emissions and ambient air monitoring.
- Our products help comply with regulated emission limit values and minimize the environmental impact of industrial processes.
- Our specialists offer analysis, consulting, and product recommendations ensure a smooth commissioning and support our customers with training and full service.





History of the DURAG GROUP

1948 – DURAG founded by H. Wilhelm Schaumann. The company name is taken from the duratron, a gamma ray detector.

1960 – Start of development of instruments for process monitoring, electronic counters and controls.

1970 – Start of development of dust measuring devices, monitoring and combustion systems.

1996 – Expansion of the product portfolio in combustion technology through acquisition of Hegwein GmbH in Stuttgart.

1997 – Acquisition of VEREWA Umwelt- und Prozessmesstechnik GmbH. Headquarters moved from Mülheim an der Ruhr to Hamburg.

2006 – Acquisition of Smitsvonk in the Netherlands, a leading supplier of high-energy ignition systems, pilot burners and ignition burners.

2015 – Acquisition of GRIMM, a world market leader in the field of optical measurement of fine particles.

2018 – 70-year anniversary of the DURAG GROUP. Expansion of the product portfolio with multigas analyzers through acquisition of ap2e.

2 | DURAG GROUP Companies

DURAG



For more than 70 years **DURAG GMBH** has been an expert provider of combustion and emission monitoring equipment. Since 1948 we have offered modern technology, certified instruments, and reliable services for the individual requirements of our customers around the world. Our own rigorous quality standards in the development and manufacture of our products are our trademark. Our employees have deep knowledge, and continually develop our products and solutions with innovative ideas.

DURAG DATA SYSTEMS



DURAG DATA SYSTEMS has over 40 years of experience in the manufacture of software and hardware for environmental and process data management. Our emissions data evaluation solutions are developed by experience engineers, software developers, and service technicians. We are pioneers in this special area of environmental protection, covering legal limit values, emissions data remote monitoring, and greenhouse gas trading. We advise small and large plant operators, industry-neutral and with long experience and worldwide expertise.

DURAG SIENA



DURAG SIENA is geared to the South American and especially to the Brazilian market. Production, assembly, development and production of products for combustion technology take place with focus on the region. The product portfolio is supplemented by emission monitoring devices, which are supplied according to the requirements of our customers.



ap2e is an innovative company in the gas analysis business for scientific and industrial application such as environment, process optimization and ambient air monitoring. Since 2006, ap2e designs, manufactures and services on-line advanced TDL gas analyser systems, powered by two patented technologies (Extended cavity TDL with Low Pressure Sampling). ap2e multigas analyzers cover a wide & dynamic range, from PPT to %, with unmatched sensitivity, selectivity, stability, fast response time within simple or complex background gas mixtures with no need for sample conditioning/heating.



GRIMM Aerosol Technik Ainring GmbH & Co. KG in Ainring is one of the world leading suppliers of instrumentation in the field of environmental and occupational safety measurements, in service of governmental authorities, research and teaching facilities, safety engineers, or accredited bodies for air quality measurements. For over 30 years, GRIMM has been standing for the optical aerosol measurement „made in Europe“. The measuring range of our systems extends from less than 1 nanometer to 35 micrometers. The measuring instruments are usable stand-alone or integrated in measuring containers. The analysis is made via an intelligent evaluation and control software. Many thousands of systems are in use worldwide, on a daily basis, reliably and with high precision, partly under the most extreme conditions. Our product portfolio for measuring aerosol and particle concentrations, ranges from measuring ultrafine and nano particles to fine dust measurements in indoor and outdoor applications, in the industrial field as well as in basic research.



Smitsvonk specializes in high-energy ignition systems, pilot burners, and ignition burners for use in industrial combustion processes. The company's electrical and electronic ignition systems have been used around the world for over 70 years, thanks to their high reliability under the most demanding conditions – ignition is not effected by dirt, air humidity, extreme temperatures, or aggressive gases. Smitsvonk is your expert for reliable ignition, and develops solutions tailored to any industrial need. About 75% of its business is within the petrochemical industry, and 10% within the iron and steel industry.



For 70 years, **Hegwein** has been the specialist in the field of gas and oil ignition burners as well as gas burners for industrial applications. Our experienced experts individually analyze your specific needs and supply pilot burner and gas burner systems that are specially tailored to your process requirements. For this purpose, solutions such as our „ZAVEX“ series are available for use in all explosion-proof zones, as well as pilot burners and burners in a compact design with integrated ignition transformer, flame detector and automatic burner control. We are your reliable partner with our individual and expert advice as well as with our long-lasting products that have already been launched on the market.



3 | Business Units

Emission Monitoring

Our solutions for emission monitoring are also prepared for further deducted emission limit values and stricter safety requirements in the near future.

Combustion Technology

Our products ensure safe ignition and controlled combustion, as well as control and monitoring of various ignition systems.

Gas Analysis

Our analyzers measure 30 different gases (pollutants or toxic or explosive or process) by laser spectroscopy for the safety, process optimization and pollution monitoring required by industries.

Ambient Air Monitoring

Our product portfolio for measuring aerosols and particle concentration ranges from the measurement of ultrafine and nano particles to particulate matter monitoring indoors, in outdoor areas as well as for application in basic research fields.

Data Management

Our new, certified D-EMS 2020 system is the next generation of environmental and process data management. Its modular structure enables individual adaption to any system requirement.



Ignition



Combustion



Control



Monitoring



Measuring



Acquisition



Evaluation



Classification



Counting



4 | Measuring + Monitoring



The world is growing together and the global exchange of goods and services is a major contributing factor. Industry and transportation are the main sources of harmful emissions that cause environmental pollution. To protect the environment, more and more countries are defining limit values for specific pollutants, which must be continuously monitored.

For this purpose we offer comprehensive solutions for the precise measurement of emissions from industrial plants, as well as for monitoring air quality in tunnels.

Highlights in Measuring + Monitoring

- We offer durable, low-maintenance instrumentation for measuring and monitoring dust concentrations and volume flow in flue gas and for continuous mercury and multigas analysis.
- We have an extensive product portfolio using different measuring techniques, with the right measuring devices for any requirement.
- We provide traffic sensors for visibility, opacity and air flow speed measurement.
- We have decades of experience and a very large installed base.
- Our worldwide locations and contact persons ensure excellent, customer service.
- We offer suitability-tested and certified measuring instruments for official emissions monitoring.
- We focus on high quality standards
Made in Germany

Find out more

For more details, see www.durag.com or our app.



5 | Measuring + Monitoring Product Groups

With 70 years of technical experience we offer our customers inclusive solutions for any measuring challenge.

Dust Monitors

Our products continuously and precisely measure dust concentrations in dry and wet gases. They are low maintenance, fully certified and extremely robust. Thereby, these monitors are designed according to the latest technology standards.

Volume Flow Measurement Systems

Even under challenging conditions, our solutions reliably provide continuous measurement of flow velocity. They can be used for official emission monitoring, exact determination of emission loads, and for process optimisation.

Gas Analysis

Our compact multigas analyzers are based on sophisticated laser spectroscopy technology, and measure 30 different gases. They are used in safety, process optimization, and emissions monitoring in many different industries.

Mercury Analysers

Our products for total mercury measurement also allow specification of elemental and oxidised mercury. This option can ideally be used for process optimisation.

Filter Monitors

Our filter monitors continuously detect the efficiency and function of filters and filtration systems. These simple and cost-effective solutions immediately and reliably detect filter breaks. Additionally, they can also be used for qualitative dust measurement.



More Information?





The following products are only a portion of our full range. For more products, versions, and accessories see www.durag.com or our app.




6 | Comparison of emission and volume flow monitors

Measuring value	Dust concentration, opacity		Dust concentration			Dust concentration, flow velocity, volume flow
	D-R 220	D-R 290	D-R 320	D-R 808	D-R 820 F	
DURAG GROUP product	D-R 220	D-R 290	D-R 320	D-R 808	D-R 820 F	D-RX 250
Measuring principle	Transmission		Backward scattering	Forward scattering		Triboelectric and differential pressure
	in-situ	in-situ	in-situ	in-situ	extractive	in-situ
Measuring ranges	Dust: 0 ... 160 mg/m ³ 0 ... 4000 mg/m ³ Opacity: 0 ... 40% 0 ... 100%	Dust: 0 ... 80 mg/m ³ 0 ... 4000 mg/m ³ Opacity: 0 ... 20% 0 ... 100%	0 ... 5 up to 0 ... 200 mg/m ³	0 ... 5 up to 0 ... 200 mg/m ³	0 ... 15 up to 0 ... 200 mg/m ³	Dust: 0 ... 10 mg/m ³ 0 ... 500 mg/m ³ Flow velocity: 7 ... 35 mg/m ³
Smallest certified measuring range	N/A	0 ... 15 mg/m ³	0 ... 7.5 mg/m ³	0 ... 7.5 mg/m ³	0 ... 15 mg/m ³	0 ... 15 mg/m ³ 0 ... 30 m/s
QAL1/ EN 15267-3		●	●	●	●	(MCERTS only)
US EPA		●	●	●		
Flue gas temperature	up to +200 °C, div. on request	up to +250 °C, div. on request	up to +600 °C	up to +350 °C	up to +220 °C	up to +200 °C, div. on request
Flue gas relative humidity	0 ... 95% RH, non condensing	0 ... 95% RH, non condensing	0 ... 95% RH, non condensing	0 ... 95% RH, non condensing	0 ... ≥100% RH, max. 30 mg/m ³ H ₂ O as aerosol	20 ... 80% RH, non condensing
Inner duct pressure (gauge)	-50 ... +50 hPa	-50 ... +20 hPa	-50 ... +50 hPa	-50 ... +50 hPa	-30 ... +2 hPa	-100 ... +300 hPa
Stack/ duct diameter	Measurement path: 0.4 ... 10 m*	Measurement path: 1 ... 18 m*	> 0.7 m	> 0.3 m	> 0.4 m	> 0.3 m
Ambient temperature	-20 ... +50 °C	-40 ... +60 °C	-40 ... +60 °C	-40 ... +60 °C	-20 ... +50 °C	-20 ... +50 °C
Automatic zero and reference point check	●	●	●	●	●	●
Automatic contamination check and correction		●	●	●	●	N/A

* dependant on flue gas and/or installation conditions

Measuring range mg/m ³	0	10	100	200	1000			
			D-R 320					
			D-RX 250					
			D-R 820 F					
			D-R 808					
			D-R 290					
			D-R 220					
Stack/ duct inner diameter	0.3	1m	6 m	12 m	18 m			
			D-RX 250					
			D-R 220					
			D-R 320					
			D-R 808					
			D-R 820 F					
			D-R 290					
Flue gas temperature	Dew point	100 °C	200 °C	300 °C	400 °C	500 °C	600 °C	
		D-R 820 F						
		D-R 320						
		D-R 220						
		D-R 290						
		D-R 808						
		D-RX 250						
Flue gas relative humidity	0%	20%	40%	60%	80%	100%		
		Triboelectric						
		Optical						
		Extractive						

 dependant on flue gas and/or installation conditions

7 | Products Measuring + Monitoring

D-R 220

Model



Dust/opacity measurement

Benefits

- Continuous and contactless measurement of opacity and dust concentration
- Ideal for medium to large dust concentrations
- Automatic zero and reference point check
- TUV Approved certificate

D-R 290

Model



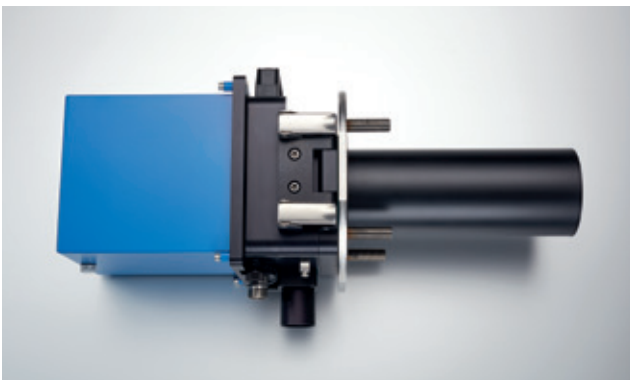
Dust/opacity measurement

Benefits

- Continuous and contactless measurement of opacity and dust concentration
- Ideal for medium to large dust concentrations
- Automatic zero and reference point check
- Automatic contamination check and correction
- QAL1 certified according to EN 15267
- Compliant with US EPA PS 1 and ASTM 6216

D-R 320

Model



Dust measurement

Benefits

- Continuous and contactless measurement of dust concentration
- Ideal for small to medium dust concentrations
- One-sided installation without optical alignment
- Automatic zero and reference point check
- Automatic contamination check and correction
- QAL1 certified according to EN 15267 and compliant with US EPA PS 11

D-R 808

Model



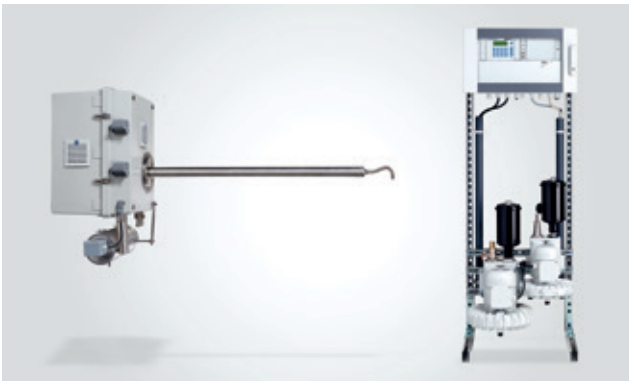
Dust measurement

Benefits

- Continuous measurement of dust concentration
- Ideal for small to medium dust concentrations
- One-sided installation without optical alignment
- Automatic zero and reference point check
- Automatic contamination check and correction
- QAL1 certified according to EN 15267, compliant with US-EPA PS 11

D-R 820 F

Model



Dust measurement

Benefits

- Continuous measurement of dust concentration in wet gases
- Ideal for small to medium dust concentrations
- Extractive measurement, dilution of the sample
- Automatic zero and reference point check
- Automatic contamination check and correction
- QAL1 certified according to DIN EN 15267

D-FW 231/240

Model



Filter monitoring

Benefits

- Continuous qualitative measurement
- Ideal for function control of filter plants
- One-sided installation, cost effective, compact, robust
- No moving parts

D-RX 250

Model



Dust/volume flow measurement

Benefits

- One probe for simultaneous measurement of
 - Dust concentration
 - Volume flow
 - Temperature
 - Absolute pressure
- Only one probe / mounting hole in the exhaust duct
- Compact design
- No moving parts
- Automatic zero and reference point check
- MCERTS certified

D-FL 100

Model



Volume flow measurement

Benefits

- Continuous measurement of flow velocity
- Versions for use at extreme high temperatures or in corrosive gases available
- Versions with or without counter-support and for point measurement
- Cost effective measurement system
- Representative measurement even at difficult flow conditions
- QAL1 certified according to EN 15267

D-FL 220

Model



Volume flow measurement

Benefits

- Continuous and contactless measurement of flow velocity
- Corrosion resistant ultrasonic transducer
- Ideal for saturated or aggressive flue gases
- Automatic zero and reference point check
- Representative measurement even at difficult flow conditions
- QAL1 certified according to EN 15267, compliant with US EPA PS 6

HM-1400 TRX 2

Model



Mercury analysis

Benefits

- Continuous mercury measurement
- Measuring principle allows specification of elemental and oxidised mercury
- Automatic reference point check with internal HgCl₂ calibration gas generator
- No extremely heated components, easy to maintain
- QAL1 certified according to EN 15267

D-ISC 100

Model



Universal operating unit

Benefits

- Quick operation and parameterisation of connected devices
- Connection of several devices to one D-ISC 100
- Combination of two D-ISC 100 per device for local and remote operation
- Modular setup, expandable with expansion modules
- Integrated purge air blower optional

D-RC 120

Model



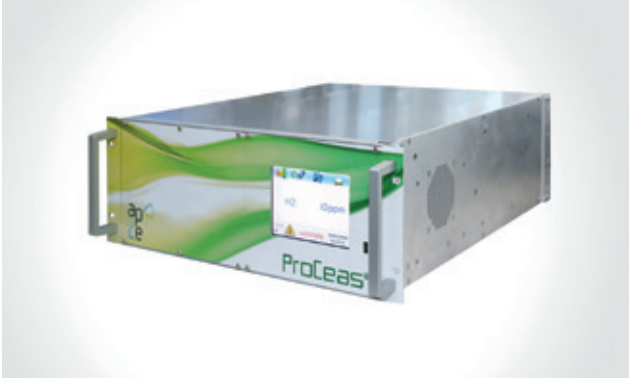
Automatic sampling

Benefits

- Automatic sampling device for gravimetric dust measurements
- Portable system
- Easy handling
- Automatic isokinetic sampling
- Highest measuring accuracy
- Compliant with EN 13284-1, VDI 2066, EN ISO 9096 and US-EPA Method 5

LaserCEM

Model



Gas Analysis

Benefits

- Specific measurements (no cross interferences) even in complex background gas mixtures due to high optical resolution and low pressure sampling
 - Km optical pathlengths allows high sensitivity: measures down to ppb/ppt level
 - High stability, no calibration required: no zero/span drift over the time thanks to automatic self-calibration of the analyser
 - The laser analyser monitors on-line by direct absorption spectroscopy
 - The analyser samples the gas directly: no need to dry/heat/condition the sample at low pressure
 - Extractive gas analyser not affected by vibrations or process conditions – extremely compact (up to 8 gases in the same analyser), easy to use and robust (no optical moving parts) – installation in safe or explosive zones
 - Minimal maintenance: no calibration required, low flow and few consumables (filters, pump) leading to very low cost of ownership
-

Contact



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