

## **Emission Monitoring**

Only those who are able to measure emissions precisely are prepared for the future.

*„Only those who are able  
to measure emissions  
precisely are prepared for  
the future.“*

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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 visualisation 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 minimise 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.

### Support

Prompt, thorough & competent  
24/7 on-call service

### Consulting

Expert service  
Applications-know-how  
Customised solutions

### Service

Qualified service technicians

### Production

Made in Germany  
Products that fit your process

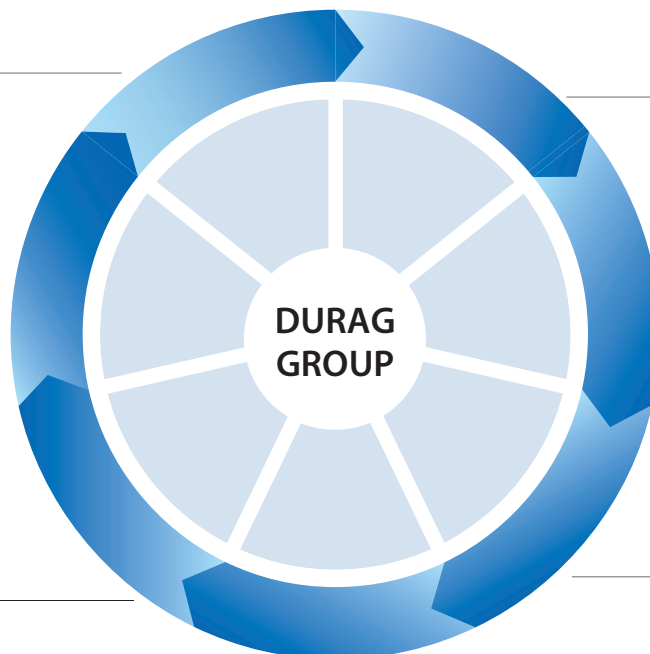
### Training

Comprehensive training for  
operators and maintenance staff

### Installation

Worldwide installation

**Commissioning**  
Worldwide commissioning  
through highly qualified and  
experienced technicians





## 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 analysers 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 experienced 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 optimisation 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 analysers 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 analyse 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 analysers measure 30 different gases (pollutants or toxic or explosive or process) by laser spectroscopy for the safety, process optimisation 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](http://www.durag.com) or our app.



## 5 | Measuring + Monitoring Product Groups

With over 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 analysers are based on sophisticated laser spectroscopy technology, and measure 30 different gases. They are used in safety, process optimisation, 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](http://www.durag.com) or our app.



## 6 | Comparison of Dust Monitors

Measuring value	Dust concentration, opacity		Dust concentration		
DURAG GROUP product	D-R 220	D-R 290	D-R 320	D-R 808	D-R 820 F
Measuring principle	Transmission		Backward scattering	Forward scattering	
	in-situ	in-situ	in-situ	in-situ	extractive
Measuring ranges	Dust: 0 ... 160 mg/m <sup>3</sup> 0 ... 4000 mg/m <sup>3</sup> Opacity: 0 ... 40% 0 ... 100%	Dust: 0 ... 80 mg/m <sup>3</sup> 0 ... 4000 mg/m <sup>3</sup> Opacity: 0 ... 20% 0 ... 100%	0 ... 5 up to 0 ... 200 mg/m <sup>3</sup>	0 ... 5 up to 0 ... 200 mg/m <sup>3</sup>	0 ... 15 up to 0 ... 200 mg/m <sup>3</sup>
Smallest certified measuring range	N/A	0 ... 15 mg/m <sup>3</sup>	0 ... 7.5 mg/m <sup>3</sup>	0 ... 7.5 mg/m <sup>3</sup>	0 ... 15 mg/m <sup>3</sup>
QAL1/ EN 15267-3		●	●	●	●
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
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 <sup>3</sup> H <sub>2</sub> O as aerosol
Inner duct pressure (gauge)	-50 ... +50 hPa	-50 ... +20 hPa	-50 ... +50 hPa	-50 ... +50 hPa	-30 ... +2 hPa
Stack/ duct diameter	Measurement path: 0.4 ... 10 m*	Measurement path: 1 ... 18 m*	> 0.7 m	> 0.3 m	> 0.4 m
Ambient temperature	-20 ... +50 °C	-40 ... +60 °C	-40 ... +60 °C	-40 ... +60 °C	-20 ... +50 °C
Automatic zero and reference point check	●	●	●	●	●
Automatic cont- amination check and correction		●	●	●	●

\* dependant on flue gas and/or installation conditions

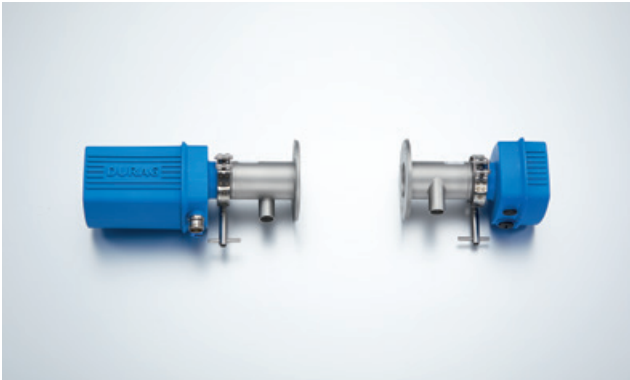
Measuring range mg/m³	0		10	100	200	1000		
			D-R 320					
			D-R 820 F					
			D-R 808					
			D-R 290					
			D-R 220					
Stack/ duct inner diameter	0.3	1m	6 m		12 m		18 m	
			D-R 220					
			D-R 320					
			D-R 808					
			D-R 820 F					
			D-R 290					
Flue gas temperature	Dew point		100 °C	200 °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					
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



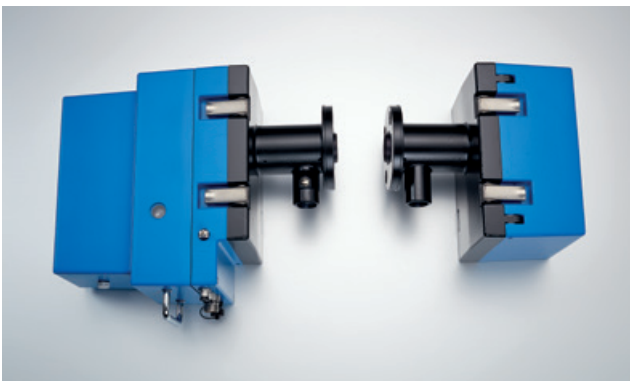
#### Dust/opacity measurement

##### 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



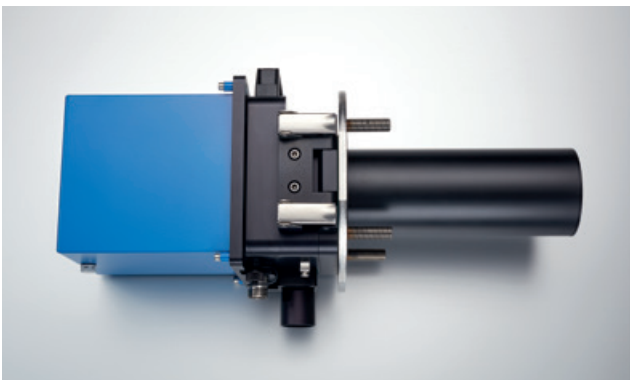
#### Dust/opacity measurement

##### 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-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 HgCl<sub>2</sub> 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



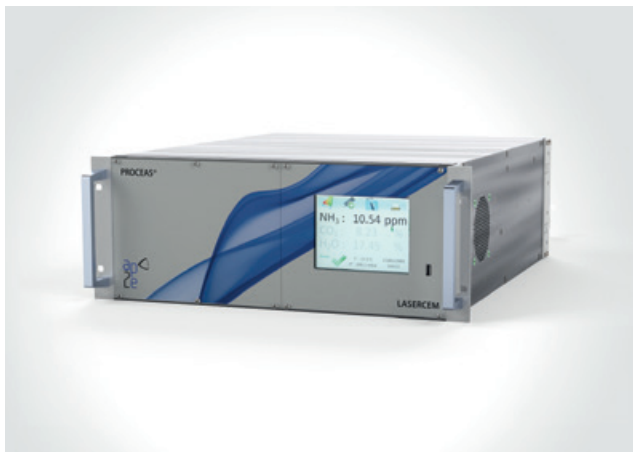
## Automatic sampling

### 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

- Extractive and complete multi-components laser spectrometer for CEM's analysis and able to measure CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, HF, SO<sub>2</sub>, HCl, NH<sub>3</sub>, CH<sub>4</sub>, CHOH, O<sub>2</sub>, H<sub>2</sub>O, etc.
- **NEW:** QAL1 certified for CO, NO, NH<sub>3</sub>, O<sub>2</sub>, H<sub>2</sub>O
- TDL OFCEAS technology associated with low pressure sampling. These features provide exceptional selectivity without interferences regardless of the matrix.
- Self-calibrating system. Zero information is contained in the signal, enabling automated and intrinsic re-zero of the analyser.
- The analyser samples the gas directly at low pressure. No need to dry/heat the sample.
- No optical moving parts, it was designed and built for industrial applications.
- Minimal maintenance: no calibration required, low flow and few consumables (filters, kit for the pump) leading to very low cost of ownership.

## Contact

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