SICK DUSTHUNTER for ESP Tuning and Broken Bag Detection

SICK
Sensor Intelligence.

Phil Zyskowski

SICK Regional Account Manager

Agenda

1. Who is SICK?
2. Dust Detection Legacy
3. DUSTHUNTER SP30
   - A Unique Design
4. DUSTHUNTER SP30 ESP Application
5. DUSTHUNTER House Broken Bag Detect Detection Application
6. Conclusion

Who is SICK?

Dr. Erwin Sick founded the SICK, Inc company in Munich in 1946.

Today the SICK name stands for technical innovation, quality and safety worldwide.

Wide product and technology portfolio

Innovative portfolio from our Global Business Centers

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PRESENCE DETECTION

INDUSTRIAL SAFETY

ANALYZERS

FLOW MEASUREMENT

INDUSTRIAL INTEGRATION SPACE

SYSTEMS

MOTION CONTROL SENSORS

IDENTIFICATION & MEASURING

NEW BUSINESS

DUSTHUNTER
Innovation in dust measurement for over 50 years

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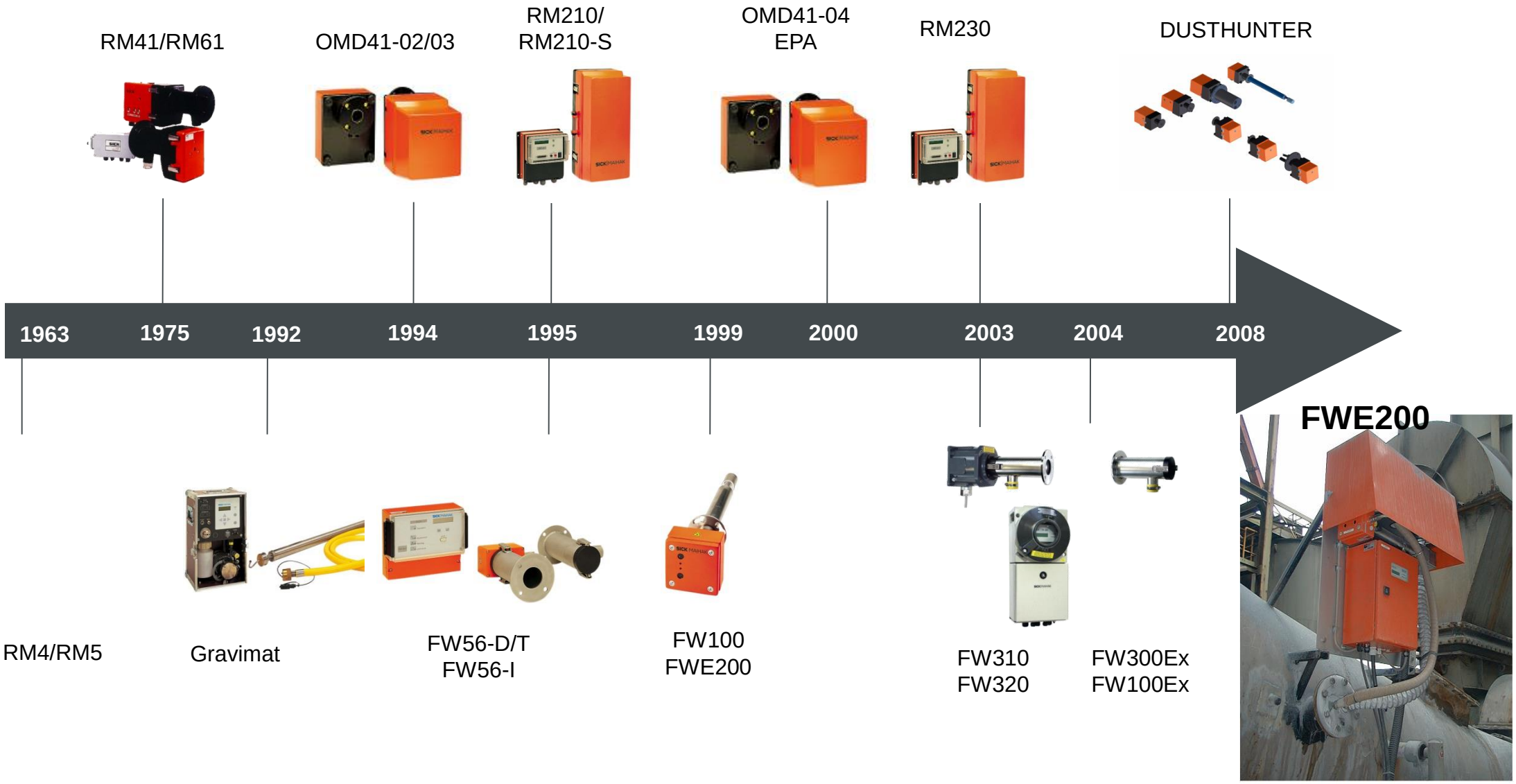
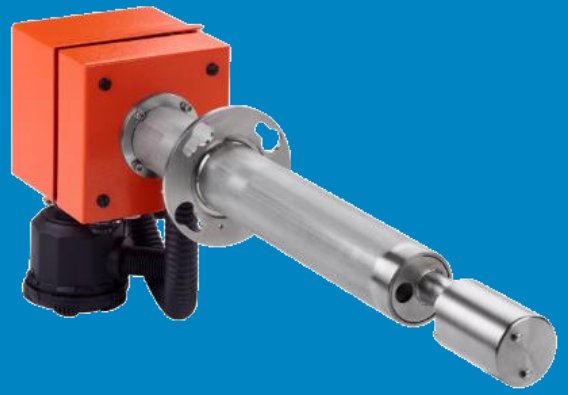




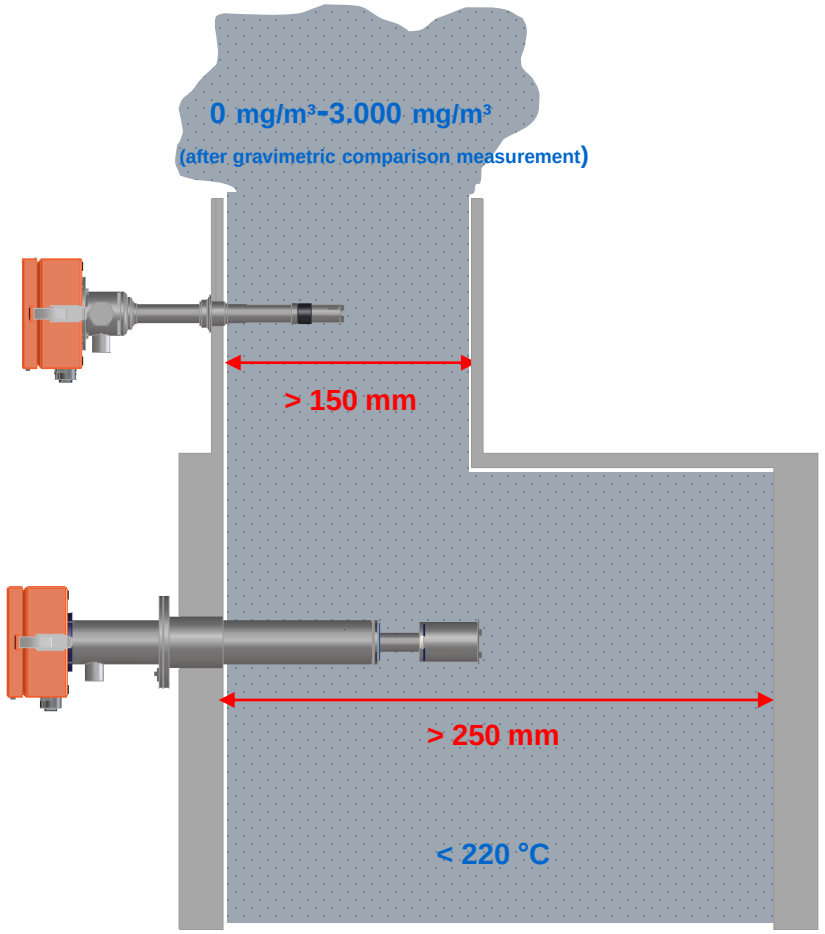
DUSTHUNTER SP30

Product Features and Configurations

TECHNICAL SPECIFICATIONS
DUSTHUNTER SP30

▪**Measured variables:**	**Scattered light intensity** **Dust concentration in mg/m³ (after gravimetric comparison measurement)**
▪**Measurement principle:**	**Scattered light forward**
▪**Spectral range:**	**640 nm ... 660 nm** Laser (class 2), Power < 1mW
▪**Measuring ranges:**	**0...7,5 SI / 0 ... 3000 SI (0...7,5 mg/m³ / 0 ... 3000 mg/m³)** 1 measuring range freely configurable, 9 measuring ranges fixed (0...7,5 / 15 / 45 / 75 / 150 / 225 / 375 / 1000 / 3000)
▪**Accuracy**	**+/- 2% of the measuring range final value**
▪**Enclosure rate:**	**IP65**
▪**Conformity:**	**TÜV Type test for dust**

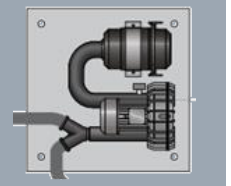
SYSTEM FEATURES
DUSTHUNTER SP30



OPTIONS:

Control Unit MCU

External purge air unit



DUSTHUNTER SP30

- Low to high dust concentrations
- Ideal for filter monitoring
- Data transmission directly from the sensor
- Quick commissioning and easy handling

Details: Features & Benefits

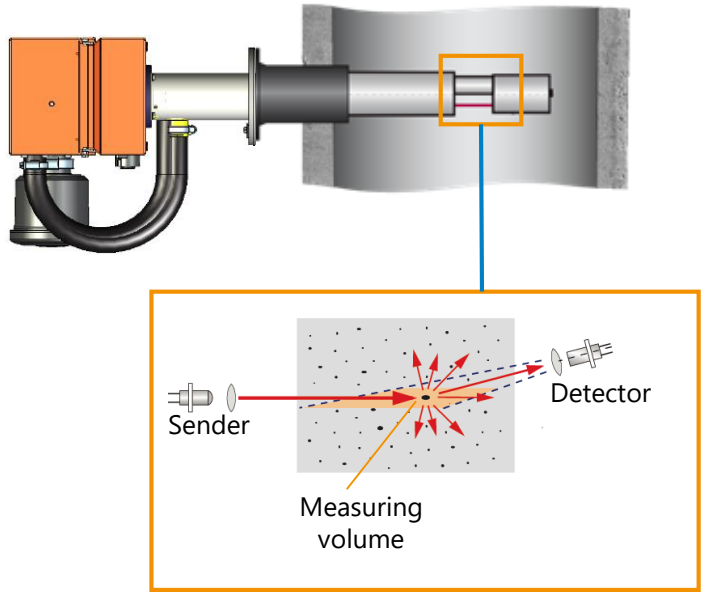
DUSTHUNTER SP30

Scattered light – forward

A laser diode beams the dust particles in the gas flow
with modulated light in the visual range.

A highly sensitive detector registers the light scattered
by the particles and sends it to a microprocessor.

Measured scattered light intensity is proportional to
dust concentration



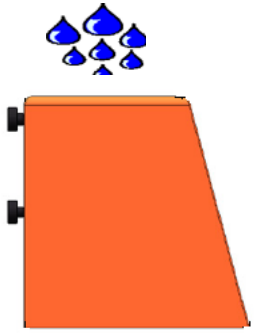
BENEFIT

- Independent of gas velocity, humidity or particle charge
- Proven technology derived from more than 50 years in dust measurement

Details: Features & Benefits

DUSTHUNTER SP30

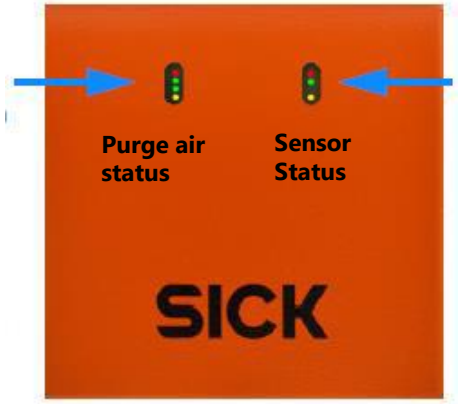
Integrated purge air at the backside



Weather proof

Without …

With …



BENEFIT

- Simplified installation and easy start-up
- Automatic monitoring and auto-regulation of purge air intake

cover

Features & Benefits
DUSTHUNTER SP30

Feature: Standalone design with optional integrated purge air

Your Benefit: Cost-efficient solution and convenient installation

Feature: Analog output and Modbus direct from sensor

Your Benefit: Easy commissioning and start-up

Feature: Different mounting options and probe lengths

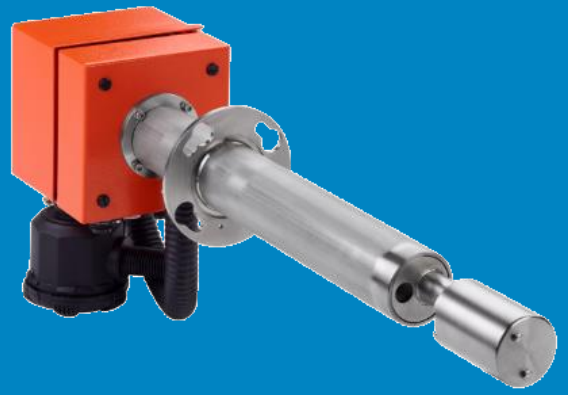
Your Benefit: High adaptability to customer requirements

Feature: Multiple configurable measurement ranges

Your Benefit: Broad application range in one device.

Feature: 2 calibration curves available in sensor

Your Benefit: Flexibility to different process conditions & fuel gas



DUSTHUNTER SP30

Technology Benchmark

TECHNOLOGY BENCHMARK
DUSTHUNTER SP30

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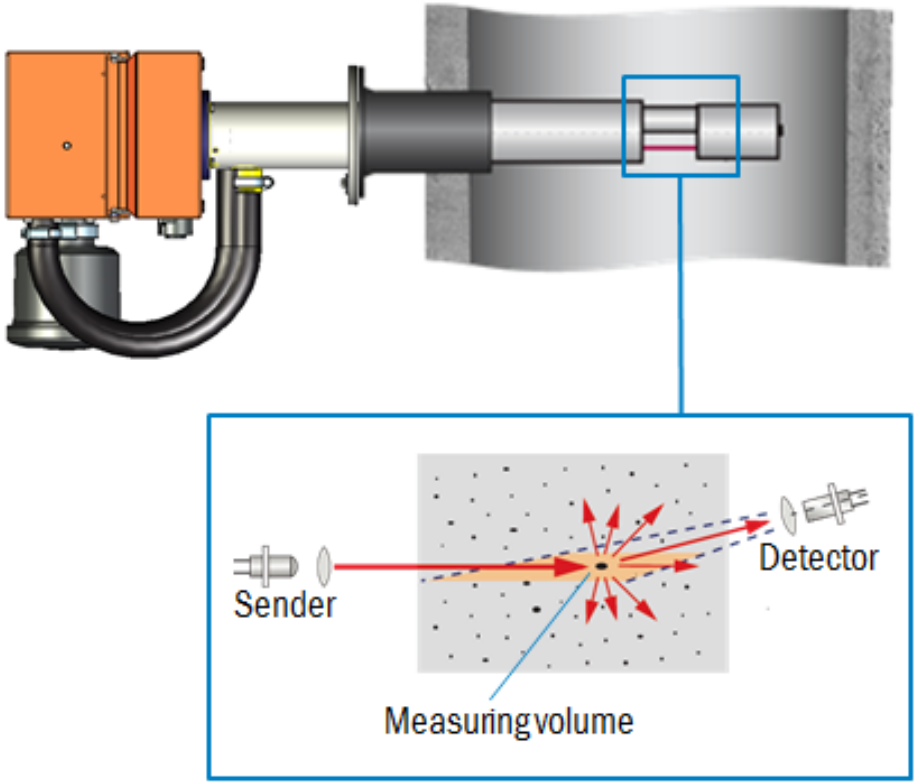
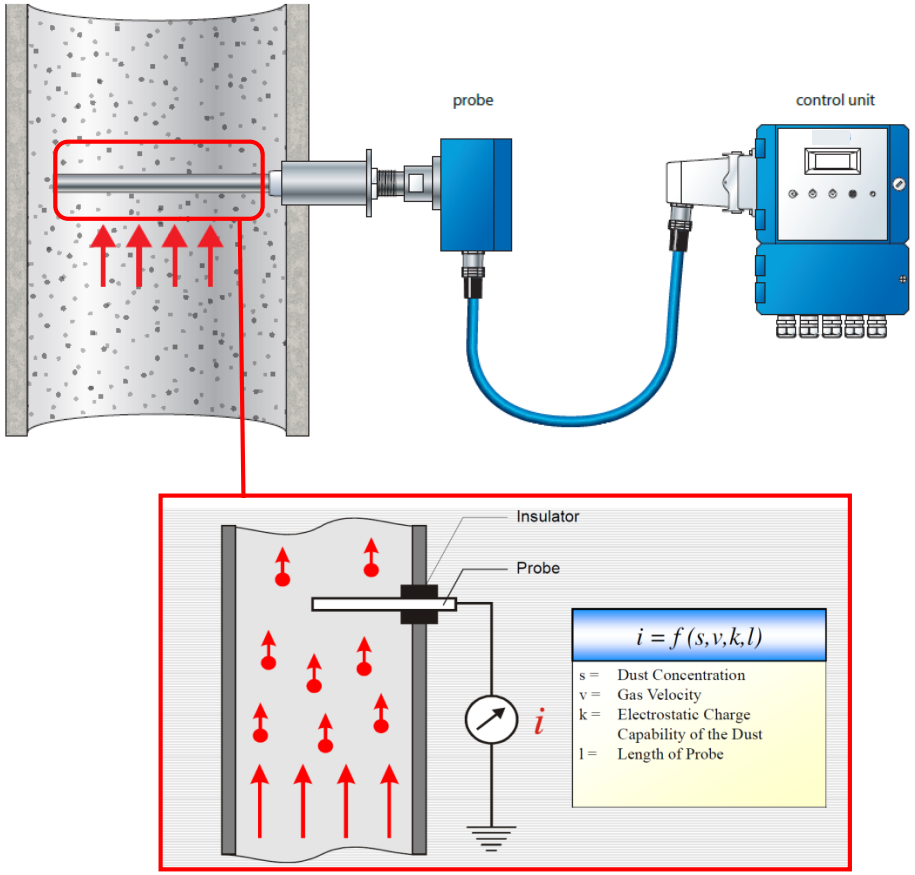
☺ **THE DUSTHUNTER SP30 …**



☹ **THE OTHER GUYS …**



TRIBOELECTRIC vs. SCATTERed LIGHT

DUSTHUNTER SP30

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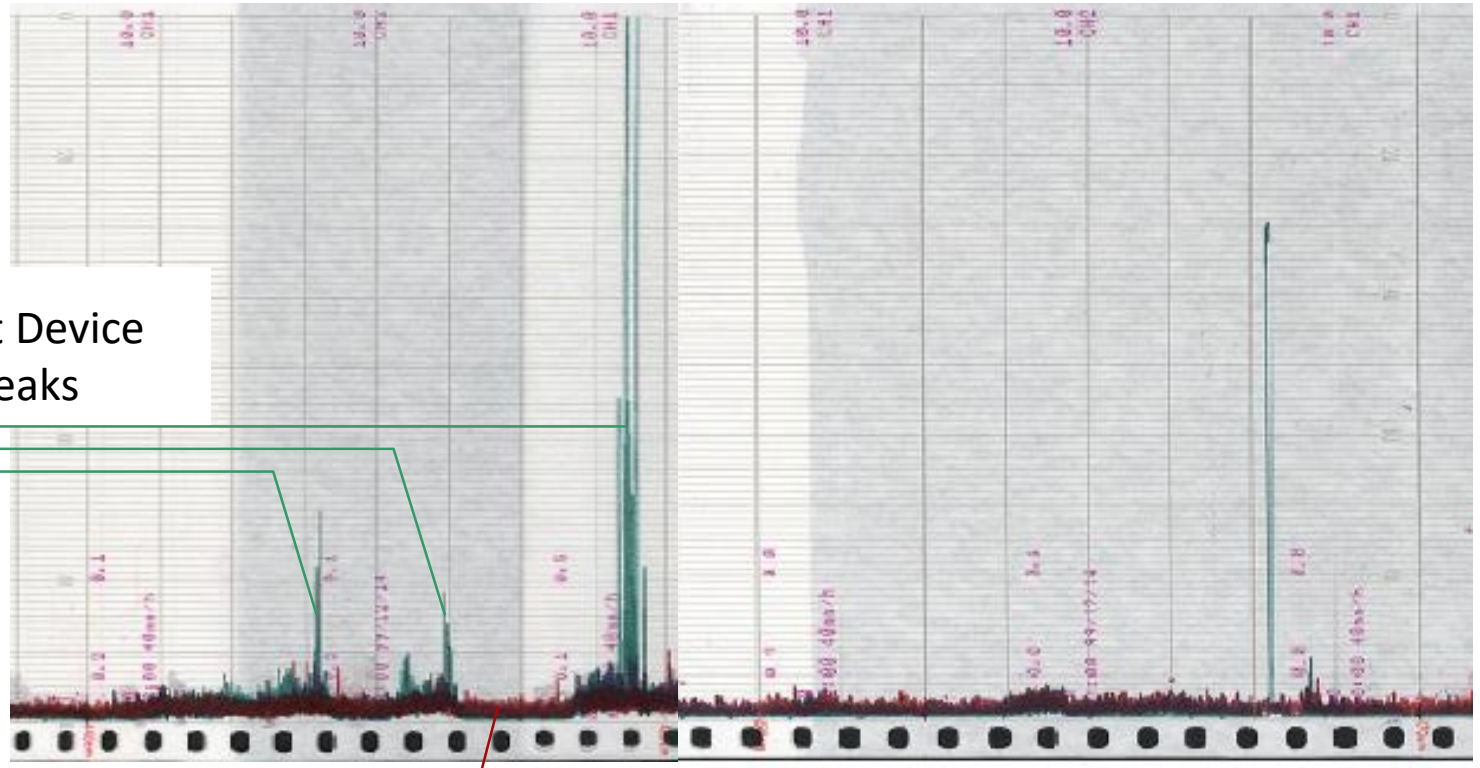

SICK Scattered Light Device
Sensitive to short peaks

Triboelectric Device
Low sensitivity, high trigger

SICK DHSP30 provides high sensitivity at affordable cost.
It enables easy surveillance and reliable predictive maintenance

DUSTHUNTER SP30

Applications

Overview fields of application

DUSTHUNTER SP30

Emission monitoring where regulation compliance is not required

Location of leaking filter elements in baghouse filters

Monitoring of electrostatic precipitators and cyclones

Dust monitoring in dosing systems

Eletrostatic Precipitator
DUSTHUNTER SP30

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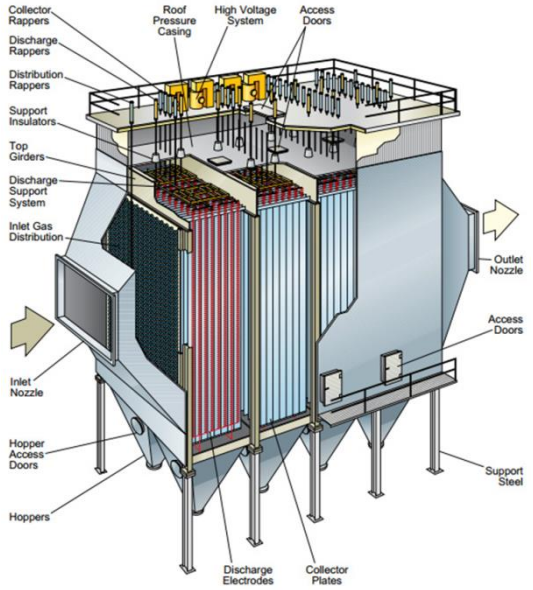
Performance on a Eletrostatic Precipitator

An eletrostatic precipitator is a particulate collection device

Dust particles are charged via an electrical field

Attraction forces cause particles to deposit on collection electrodes

Automatic chamber impacts clean the electrodes regularly so that particles fall into a container and can be disposed accordingly.



DUSTHUNTER SP30

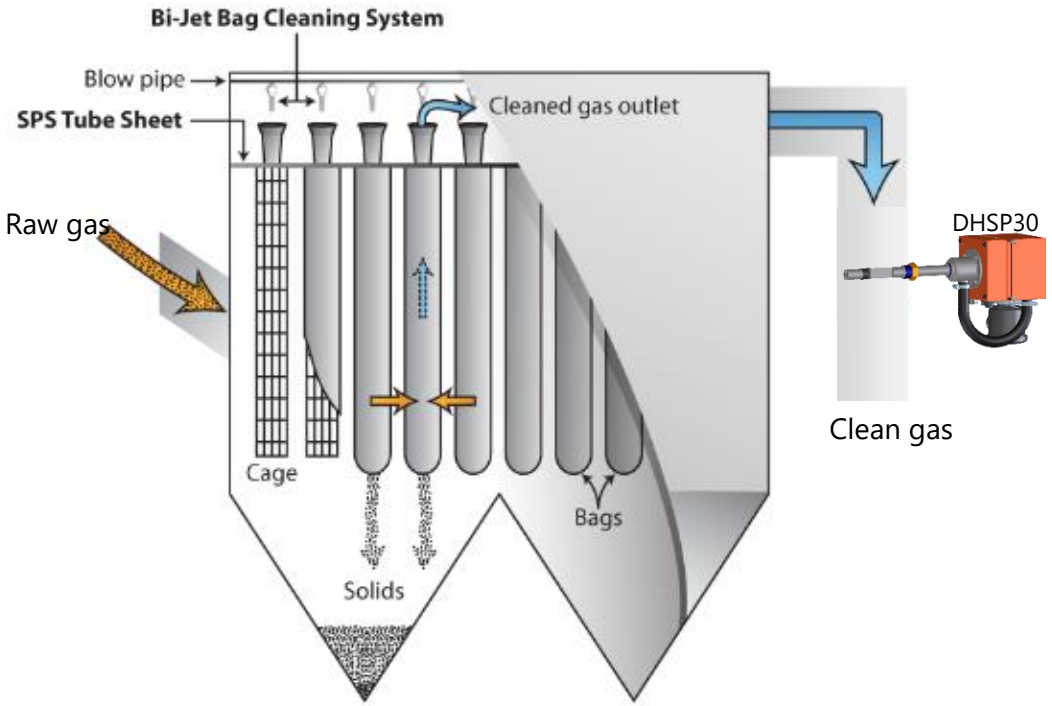
Baghouse Filter Monitoring

FABRIC FILTER LEAK DETECTION AND DIAGNOSTICS

DUSTHUNTER SP30

Filter monitoring

The DUSTHUNTER SP30 can be used to locate defective filter bags in cyclically cleaned hoses or filter bags.



Prerequisites

- Cyclic cleaning of filter bags
- Debounced synchronizing signal (DI4) with a duration of 100 ... 900 ms
- Pulse interval at least 0.5 s and greater than 2x T_{90} time for the dust concentration measurement

Input parameters required

- Number of filter hoses in a filter bag
- Impulse interval
- Delay time between purge bursts

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In general, it can be stated that :

If you believe

- the humidity, the velocity of the dust particle in the medium are always constant
- the dust particles always have the same electrical charge
- the linearity of the device does not have to be checked

Then , the most simple procedure can be chosen , i.e. **triboelectric**.

If you intend to measure the dust load

- independent of the humidity and the electrical charging of the particles
- independent of the velocity of the dust particles
- with automatic and manual options for checking the reference points of the device

Then an optical procedure should be chosen, e.g. **scattering light**

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THOUSANDS OF DIFFERENT APPLICATIONS

MEET THE CHANGING BUSINESS CHALLENGES OF OUR CUSTOMERS

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