



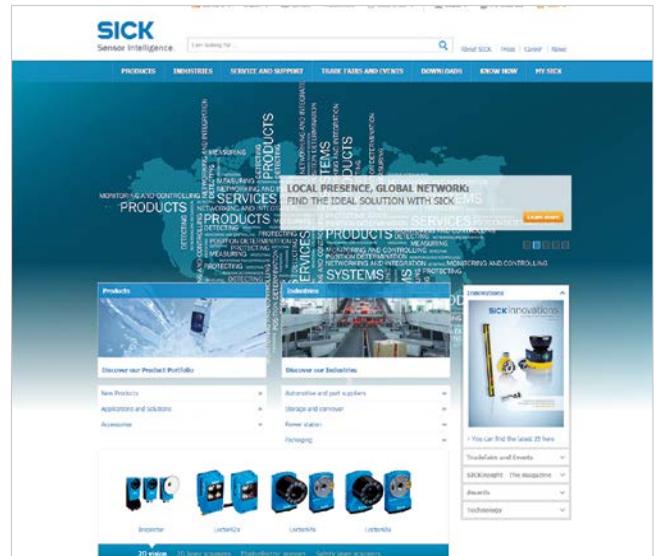
DUST MEASURING DEVICES

Light scatter, transmittance, gravimetric dust measurement devices

SICK
Sensor Intelligence.

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SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.



- 
Consulting and design
 Safe and professional
- 
Product and system support
 Reliable, fast and on-site
- 
Verification and optimization
 Safe and regularly inspected
- 
Upgrade and retrofits
 Easy, safe and economical
- 
Training and education
 Practical, focused and professional

OVERVIEW OF DUST MEASURING DEVICES

Product	Page	Measurement principle				Certification						Measurement conditions					Measurement conditions			Test functions			Channel diameter								
		Light scatter forward	Light scatter reversed	Transmission	Gravimetric analysis	EN 15267 ¹⁾	EN 13284	MCERTS	U.S. EPA	GOST	Ex, ATEX	Low concentrations (< 200 mg/m ³)	High concentrations (> 200 mg/m ³)	Moist gas	Aggressive gas	Non-homogeneous media density	Channel interior pressure (-50 hPa ... +30 hPa)	Max. process temperature (+600 °C)	Max. process temperature (+400 °C)	Max. process temperature (+300 °C)	Max. process temperature (+220 °C)	Automatic control cycle	Manual linearity test	Contamination check	0.5	1	3	5	8	12	50
Scattered light dust measuring devices																															
 DUSTHUNTER SB100	→ D-38		■			■		■	■	■		■		■	■		■	■			■	■	■								≥ 500 mm
 DUSTHUNTER SB50	→ D-46		■						■					■	■						■	■									≥ 500 mm
 DUSTHUNTER SB30	→ D-54		■											■	■						■	■									≥ 500 mm
 DUSTHUNTER SF100	→ D-62	■				■		■	■	■		■							■		■	■	■								0.5 ... 3 m 2.5 ... 6 m
 DUSTHUNTER SP100	→ D-72	■				■		■	■	■		■									■ ²⁾³⁾	■									≥ 250 mm
 FWE200DH	→ D-82	■				■ ¹⁾		■	■			■		■							■ ⁵⁾										≥ 400 mm
 FW101 Ex	→ D-88	■				■ ⁴⁾				■	■										■ ²⁾	■									≥ 250 mm
 FW102	→ D-96	■				■ ⁴⁾				■											■										≥ 150 mm
Transmittance dust measuring devices																															
 DUSTHUNTER C200	→ E-108	■		■		■			■	■		■		■							■		■								0.5 ... 3 m 2.5 ... 8 m
 DUSTHUNTER T200	→ E-120		■			■		■	■	■		■		■							■	■									0.5 ... 2.5 m 2 ... 5 m 4 ... 12 m 10 ... 50 m
 DUSTHUNTER T100	→ E-130		■			■		■	■	■		■		■							■	■									0.5 ... 2.5 m 2 ... 5 m 4 ... 12 m
 DUSTHUNTER T50	→ E-140		■						■			■		■							■	■									0.5 ... 2.5 m 2 ... 5 m 4 ... 8 m
 FW300 Ex	→ E-148		■							■		■		■							■	■									0.5 ... 2.5 m 1.5 ... 8 m
Gravimetric dust measuring devices																															
 SHC500 Gravimat	→ F-158				■	■		■	■		■	■									■	■									≥ 150 mm

¹⁾ For systems requiring permission acc. to e.g. 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27. BImSchV.

²⁾ Channel interior pressure: up to 10 kPa.

³⁾ Version up to 200 kPa on request.

⁴⁾ Tested for suitability by TÜV for systems requiring permission acc. to TA Luft (German Technical Instructions on Air Quality Control) and 27. BImSchV.

⁵⁾ Channel interior pressure: -20 hPa ... +20 hPa.



GENERAL INFORMATION

About SICK

A

TECHNOLOGIES AND SERVICES

B

TYPICAL APPLICATIONS

C

SCATTERED LIGHT DUST MEASURING DEVICES

DUSTHUNTER SB100, DUSTHUNTER SB50, DUSTHUNTER SB30,
DUSTHUNTER SF100, DUSTHUNTER SP100, FWE200DH,
FW101 Ex, FW102

D

TRANSMITTANCE DUST MEASURING DEVICES

DUSTHUNTER C200, DUSTHUNTER T200, DUSTHUNTER T100,
DUSTHUNTER T50, FW300 Ex

E

GRAVIMETRIC DUST MEASUREMENT DEVICES

SHC500 Gravimat

F

WE DELIVER “SENSOR INTELLIGENCE.”

A

SICK sensor solutions for industrial automation are the result of exceptional dedication and experience. From development all the way to service: The people at SICK are committed to investing all their expertise in providing with the very best sensors and system solutions possible.

A company with a culture of success

More than 7,400 people are on staff, with products and services available to help SICK sensor technology users increase their productivity and reduce their costs. Founded in 1946 and headquartered in Waldkirch, Germany, SICK is a global sensor specialist with more than 50 subsidiaries and agencies worldwide. The people work with pleasure at SICK.

This is demonstrated by the accolades that the company is regularly awarded in the “Great Place to Work” competition. This lively corporate culture holds strong appeal for qualified and skilled persons. In SICK, they are part of a company that ensures an excellent balance between career progression and quality of life.



Innovation for the leading edge

SICK sensor systems simplify and optimize processes and allow for sustainable production. SICK operates at many research and development centers all over the world. Co-designed with customers and universities, our innovative sensor products and solutions are made to give a decisive edge. With an impressive track record of innovation, we take the key parameters of modern production to new levels: reliable process control, safety of people and environmental protection.

A corporate culture for sustainable excellence

SICK is backed by a holistic, homogeneous corporate culture. We are an independent company. And our sensor technology is open to all system environments. The power of innovation has made SICK one of the technology and market leaders – sensor technology that is successful in the long term.



“SENSOR INTELLIGENCE.” FOR ALL REQUIREMENTS

A

SICK is a renowned expert in many industries, and is entirely familiar with the critical challenges they face. While speed, accuracy and availability take center stage in all industries, technical implementations vary greatly. SICK puts its vast experience to use to provide with precisely the solution you need.

For applications worldwide

Hundreds of thousands of installations and applications go to prove that SICK knows the different industries and their processes inside out. This tradition of uncompromising expertise is ongoing: As we move into the future, we will continue

to design, implement and optimize customized solutions in our application centers in Europe, Asia and North America. You can count on SICK as a reliable supplier and development partner.



For your specific industry

With a track record of proven expertise in a great variety of industries, SICK has taken quality and productivity to new heights. The automotive, pharmaceutical, electronics and solar industries are just a few examples of sectors that benefit from our know-how. In addition to increasing speed and improving traceability in warehouses and distribution centers, SICK solutions provide accident protection for automated guided vehicles. SICK system solutions for analysis and flow measurement of gases and liquids enable environmental protection and sustainability in, for example, energy production, cement production or waste incineration plants.

For performance across the board

SICK provides the right technology to respond to the tasks involved in industrial automation: measuring, detecting, monitoring and controlling, protecting, networking and integrating, identifying, positioning. Our development and industry experts continually create groundbreaking innovations to solve these tasks.

→ www.sick.com/industries



A

SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

SICK LifeTime Services is a comprehensive set of high-quality services provided to support the entire life cycle of products and applications from plant walk-through to upgrades. These services increase the safety of people, boost the productivity of machines and serve as the basis for our customers' sustainable business success. LifeTime Services range from product-independent consulting to traditional product services and are characterized by extensive industry expertise and 70 years of experience.





→ www.sick.com/service



Consulting and design

- Plant walk-through
- Risk assessment
- Safety concept
- Safety software and hardware design
- Validation of functional safety
- CE-conformance check



Product and system support

- Installation
- Commissioning
- Start-up support
- Calibrations
- Telephone support
- 24-hour helpline
- SICK Remote Service
- Troubleshooting on site
- Repairs
- Exchange units
- Extended warranty



Verification and optimization

- Inspection
- Stop time measurement
- Machine safety inspection
- Electrical equipment check
- Accident investigation
- Initial verification
- Performance check
- Maintenance



Upgrade and retrofits

- Upgrade services



Training and education

- Training
- Seminars
- Web training



VERSATILE PRODUCT RANGE FOR INDUSTRIAL AUTOMATION

A

From the simple acquisition task to the key sensor technology in a complex production process: With every product from its broad portfolio, SICK offers a sensor solution that best combines cost effectiveness and safety.

→ www.sick.com/products

Photoelectric sensors

- Miniature photoelectric sensors
- Small photoelectric sensors
- Compact photoelectric sensors
- Cylindrical photoelectric sensors
- Fiber-optic sensors and fibers
- MultiTask photoelectric sensors



Proximity sensors

- Inductive proximity sensors
- Capacitive proximity sensors
- Magnetic proximity sensors



Magnetic cylinder sensors

- Analog positioning sensors
- Sensors for T-slot cylinders
- Sensors for C-slot cylinders
- Sensor adapters for other cylinder types



Registration sensors

- Contrast sensors
- Markless sensors
- Color sensors
- Luminescence sensors
- Fork sensors
- Array sensors
- Register sensors
- Glare sensors



Automation light grids

- Measuring automation light grids
- Switching automation light grids



Opto-electronic protective devices

- Safety laser scanners
- Safety light curtains
- Safety camera systems
- Multiple light beam safety devices
- Single-beam photoelectric safety switches
- Mirror columns and device columns
- Upgrade kits for opto-electronic protective devices



Safety switches

- Electro-mechanical safety switches
- Non-contact safety switches
- Safety locking devices
- Safety command devices



sens:Control – safe control solutions

- Safe sensor cascade
- Safety controllers
- Motion Control safety controllers
- Safety relays



Gas analyzers

- Gas transmitters
- In-situ gas analyzers
- Extractive gas analyzers



Dust measuring devices

- Scattered light dust measuring devices
- Transmittance dust measuring devices
- Gravimetric dust measuring devices



Analyzer solutions

- CEMS solutions
- Process solutions



A

Traffic sensors

- Tunnel sensors
- Overheight detectors
- Visual range measuring devices



Ultrasonic gas flow measuring devices

- Volume flow measuring devices
- Mass flow measuring devices
- Flow velocity measuring devices
- Gas flow meters



Identification solutions

- Image-based code readers
- Bar code scanners
- RFID
- Hand-held scanners
- Connectivity



Vision

- 2D vision
- 3D vision
- Sensor integration machine



Distance sensors

- Displacement measurement sensors
- Mid range distance sensors
- Long range distance sensors
- Linear measurement sensors
- Ultrasonic sensors
- Optical data transmission
- Position finders



Detection and ranging solutions

- 2D laser scanners
- 3D laser scanners
- Radar sensors



Motor feedback systems

- Motor feedback system rotary HIPERFACE®
- Motor feedback system rotary HIPERFACE DSL®
- Motor feedback system rotary incremental

- Motor feedback system rotativ incremental with commutation
- Motor feedback system linear HIPERFACE®



Encoders and inclination sensors

- Absolute encoders
- Incremental encoders
- Linear encoders
- Wire draw encoders

- Safety encoders
- Inclination sensors
- Measuring wheel encoders



Fluid sensors

- Level sensors
- Pressure sensors

- Flow sensors
- Temperature sensors



System solutions

- Customized analyzer systems
- Driver assistance systems
- Robot guidance systems
- Object detection systems
- Profiling systems

- Quality control systems
- Security systems
- Track and trace systems
- Functional safety systems



Softwareprodukte

- SICK AppSpace
- Analytics Solutions

- Integrated Managing Solutions



WHY IS DUST MEASURING SO IMPORTANT?

B

Recording and precise measurement of dust and particle emissions are required for sustainable environmental protection. This is because dust particles, particularly those created by industrial plants, have significant impacts on humans and the environment. SICK, one of the leading manufacturers of innovative and modern dust measuring devices with decades of experience, makes a valuable contribution in this field. With an extensive product portfolio of devices working with continuous and discontinuous measurement principles and dust measurement equipment for moist exhaust gases, SICK can offer the right solution for even the most difficult measuring tasks.



Emissions

Emissions in terms of the environment refer to the discharge, transmission or disposal of disrupting factors into the environment. Emissions are comprised of toxic, harmful or environmentally hazardous chemical substances as well as pollutants of all kinds, irritants and allergens. Each emission results from an immission (discharge).

Immissions

Immissions are environmentally-harmful air, water or soil contaminations at the location of impact which result from emissions. The environment can be protected primarily by way of limiting emissions. Statutory limitations always represent interference into the freedom of action of the generating industry. For this reason, in many countries emissions may not be limited "for their own sake", but only in accordance with the principle of proportionality – corresponding to their harmful effect on the environment and human health.

PARTICLES AND DUST AND THEIR INFLUENCE

Dust consists of a mixture of visible and invisible, floating and deposited particles of solid matter. Their different shapes, sizes and chemical compositions determine the properties of dust. Primarily the grain size, geometric shape and hazardous substances adhering to the surface are relevant to health. Dust is classified as coarse dust if the particles have an aerodynamic diameter of $> 10 \mu\text{m}$ and as fine dust if the particles have an aerodynamic diameter of $< 10 \mu\text{m}$.

Particle types

Solid particles in the air are roughly divided up into soot, dust and smoke. Soot primarily consists of carbon caused by incomplete combustion processes. Dusts are finely dispersed solid particles in the air created by mechanical processes or resuspension. Smokes consist of finely dispersed solid particles in the air created by chemical or thermal processes.

Forms of dust

Asbestos dust

Asbestos dust is a collective term for different naturally-occurring fibrous silicate minerals. That asbestos is harmful to health is undisputed. This makes it even more important to prevent these dusts from getting into the environment. Reliable measurements around the clock ensure this does not happen.



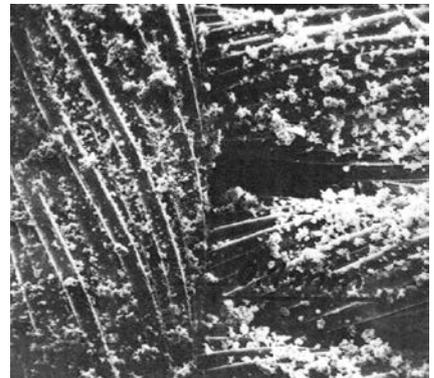
Coal dust

Coal dust is dusty lignite or black coal. This dust is created during the degradation process of coal in storage sites, or the dust is intentionally produced in grinding plants. Coal dust has a maximum particle diameter of 0.5 mm.



Household dust

Household dust is the collective term for particulate and fibrous immissions in closed spaces. It is a mixture of a wide range of organic and inorganic materials, such as fibers, lint, hair, hazardous materials, rock granules, road dust, particulates, cosmic dust and fine dust.



Influences on measurement technology

In order to be able to reliably and precisely measure dust and particle concentrations, the following criteria must be considered:

- Determination of the measurement site for representative measurement results
- Measurement sections and flow conditions at the measurement site
- Very low to very high dust concentrations
- Gas composition in the measurement medium - from ambient air to aggressive medium
- Particle properties such as size or grain size, shape, color, material, thickness or specific features such as abrasive or sticky
- Ambient conditions such as the ambient temperature and air composition, e.g. salty or fine dust

WHY MEASURE EMISSIONS?

Global warming and the emergence of the greenhouse effect make it necessary to act. One important measure is to sustainably measure the emission of climate-relevant gases. In this way, it is possible to attain an important reference value for the efficient reduction of greenhouse gas emissions.

Moreover, locally the hazardous impact of smog, ozone and dust play a decisive role. In many countries there is a legislative basis for a sustainable, environmentally compatible reduction of greenhouse gas emissions as well as laws and regulations relating to the emission of pollutants. These regulations include specifications for technology and modes of operation

for systems as well as specifications detailing the permissible pollutant limits in released clean gas. Moreover, provisions are being established that allow measurement technology to be used for monitoring.

B

Emission limit values

Emission limit values are the maximum values for legally-permissible output of mass flows or hazardous materials. They are typically specified by specific parameters such as concentration and/or amount of emissions which must not be exceeded during one or several periods of time.

For plant operators, it is clearly necessary to take forward-thinking steps based on the best available measurement technology for the progressive development of measures as well as their methods and processes. However, these limit values are often defined "politically".



Regulations, approval bodies and elements

European and international guidelines and regulations

- **EU guidelines** and **TÜV certifications** with ordinances on:
 - Large combustion and gas turbine plants (2001/80/EC)
 - Incineration and co-incineration of waste (2000/76/EC)
- Quality standards for automatic measurement systems:
 - **EN 14181** – Emissions from stationary sources, quality assurance for automatic measurement equipment
 - **EN 15267** – Testing and certification of automatic test equipment
 - **EN 13284** – Emissions from stationary sources for identifying low dust concentrations

- The new **industrial emissions directive 2010/75/EU** for integrated prevention and reduction of environmental pollution
- Approval body **MCERTS** for Great Britain
- Environmental agency **U.S. EPA** with the American quality standards (EPA CFR 11 Part 60 and Part 75)
- Japanese standard **JQA**
- Standards organization **GOST** for CIS standards and regulations
- Chinese **EPA CEP**
- **EPA standards** for many other countries

German guidelines and regulations

- Federal Control of Pollution Regulation (**BImSchV**)
- Federal Control of Pollution Regulation ordinances **17. BImSchV** and **30. BImSchV**
- German Technical Instructions on Air Quality Control – **TA Luft**

BEST AVAILABLE MEASUREMENT TECHNOLOGY

In addition to the selection of the best available technologies, a whole string of influences and requirements must be taken into account when creating a successful measuring task. The more detailed and precisely the requirements are defined, the safer and cheaper the measuring task can be. This goes for the entire operating time, not only for purchasing. SICK can really play to its strengths here with its extensive product portfolio, its proven measurement technology and its decades of experience with thousands of installations.

Influences on measurement technology

In order to be able to reliably and exactly measure dust and particle concentrations, the following criteria must be considered:

Selection of the measurement site

A decisive factor for reliable and representative measurement results is the determination of the measurement site at the plant. This can considerably influence the measurement technology and the measuring device with its long-term operation.

Measurement section

Are very small channels, such as measurement sections from 0.25 m, or chimneys with very large diameters of over 12 m to be measured?

Flow conditions

Which flow conditions prevail at the measurement site: homogeneous flows or turbulent flows at concentrations of $> 10 \text{ g/m}^3$?

Concentrations

Are very low particle concentrations of $< 1 \text{ mg/m}^3$ or moderate to very high concentrations to be measured?

Gas compilation

Which gas composition does the measurement medium have - from ambient air to aggressive medium?

Particle properties

Which particle properties prevail? Which particle size or grain size, shape, color, material or thickness exist? Are the particles sticky or abrasive?

Ambient conditions

Which ambient conditions apply on-site? How high is the ambient temperature? What air composition prevails? Is the air saline or does it contain fine dust?



How is dust measured?

There are two basic measurement procedures:

Continuous dust measurement

Continuous dust measurement which functions continuously by means of optical, electrical or other measurement principles. These measurement procedures are used preferentially for continuous around-the-clock measurements over long periods of time.

- For more information, see page B-16
- Products, see Chapter D and Chapter E

Discontinuous dust measurement

Discontinuous dust measurement with the gravimetric measurement principle. Gravimetric determination of the dust concentration is the recognized and trusted reference method for calibrating all continually measuring systems.

- For more information, see page B-20
- Products, see Chapter F

CONTINUOUS DUST MEASUREMENT PRINCIPLES

Transmissiometry and scattered light measurement are used primarily for continuous dust measurement principles.

Transmissiometry

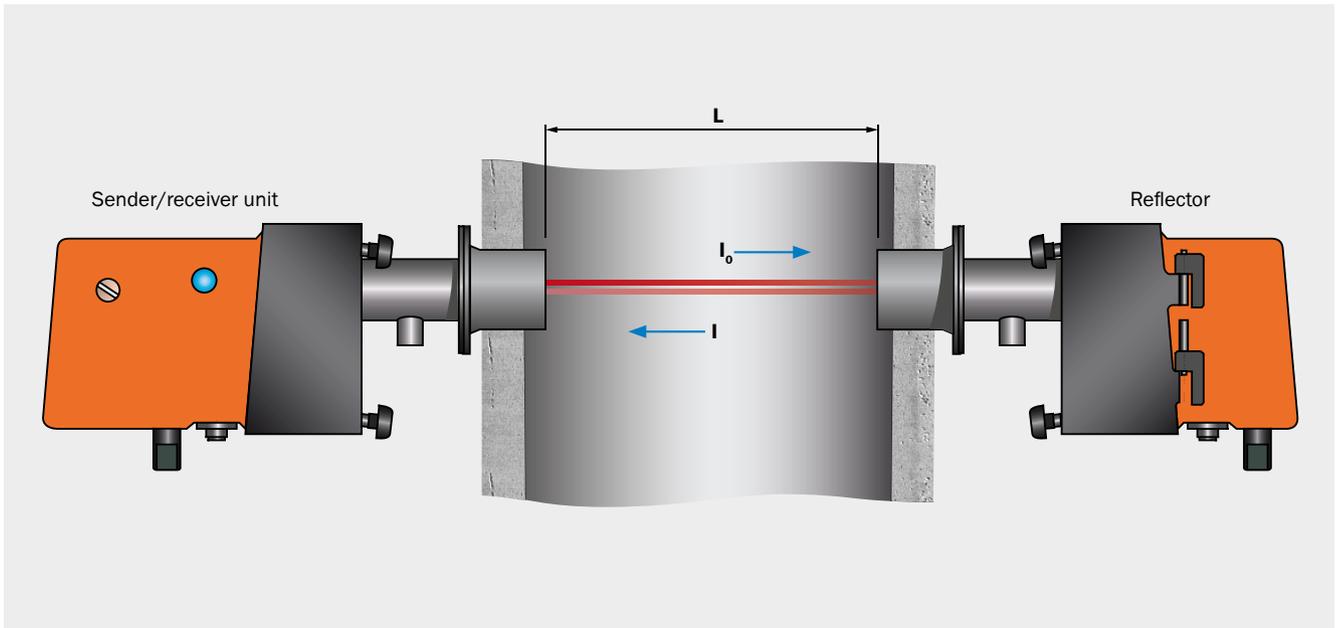
Light shines through a mixture of gas and particles whose intensity is weakened by the particles. The more particles are located in the light beam, the more the light is weakened. In SICK transmittance measuring devices, the light beam runs through the measurement section twice. The reflector opposite the sender throws the light back to a highly-sensitive receiver which precisely compares the intensity of the received (weak-

ened) light with that of the sent (unweakened) light. The difference allows for an exact expression of the transmission. The dust concentration in mg/m³ can be calculated by converting the transmittance values in extinction and a gravimetric comparison measurement. The dust concentration is proportional to extinction.

B

► Suitable for measuring moderate to high dust concentrations.

Calculation of the dust concentration



T = transmission = light transmission

I₀ = output light

I = received light

O = opacity = light weakening

E = extinction = logarithmic measure for light weakening

k = extinction coefficient, depending on grain size, shape, surface and light wavelength

L = double measurement section

c = concentration

Transmission $T = \frac{I}{I_0}$

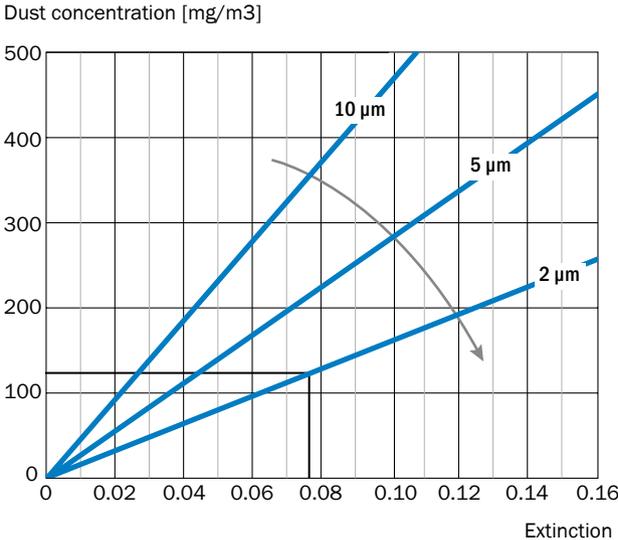
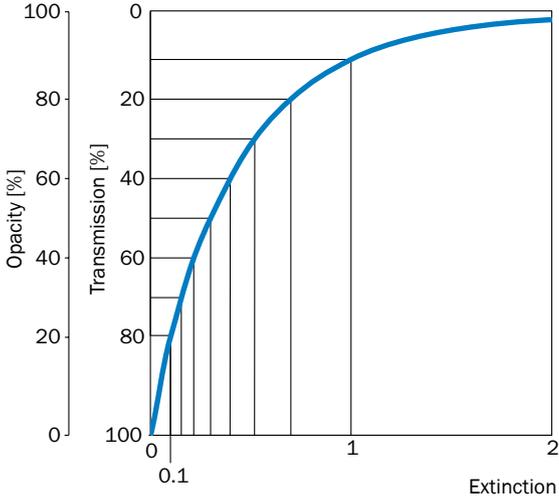
Opacity $O = 1 - T = 1 - \frac{I}{I_0}$

Extinction $E = \log \frac{1}{T} = -\lg(T)$

Beer-Lambert law ¹⁾ $I = I_0 \cdot e^{-k \cdot L \cdot c}$

Dust concentration $c = \frac{\ln(T)}{-k \cdot L}$
 $\ln(T) = 2.3 \cdot \log(T)$
 $c = 2.3 \cdot \frac{E}{k \cdot L}$

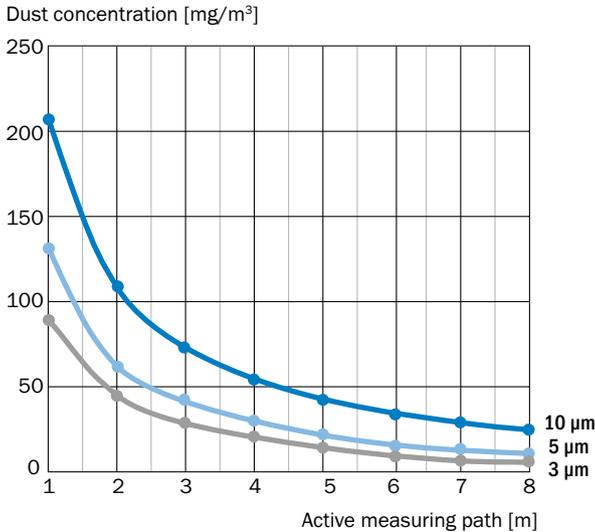
¹⁾ Beer-Lambert law = correlation between weakened light intensity I and dust concentration c on measurement section L.



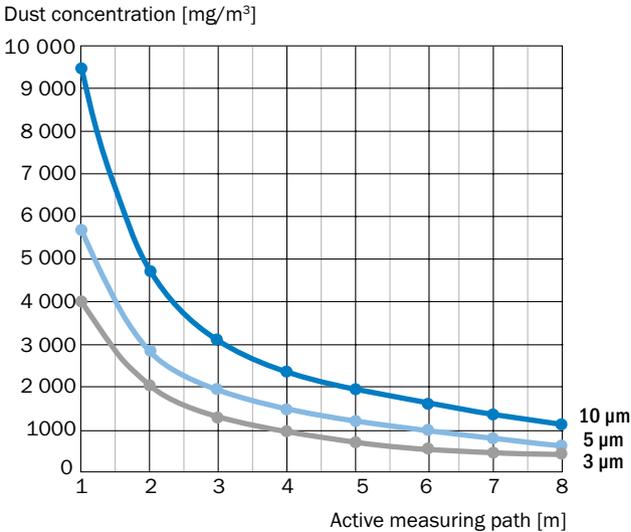
B

Dependency of the measured dust concentration on the measurement section and particle size

Smallest measuring range



Largest measuring range



CONTINUOUS DUST MEASUREMENT PRINCIPLES

The scattered light measurement is the second common variant of continuous dust measurement principles.

Scattered light measurement

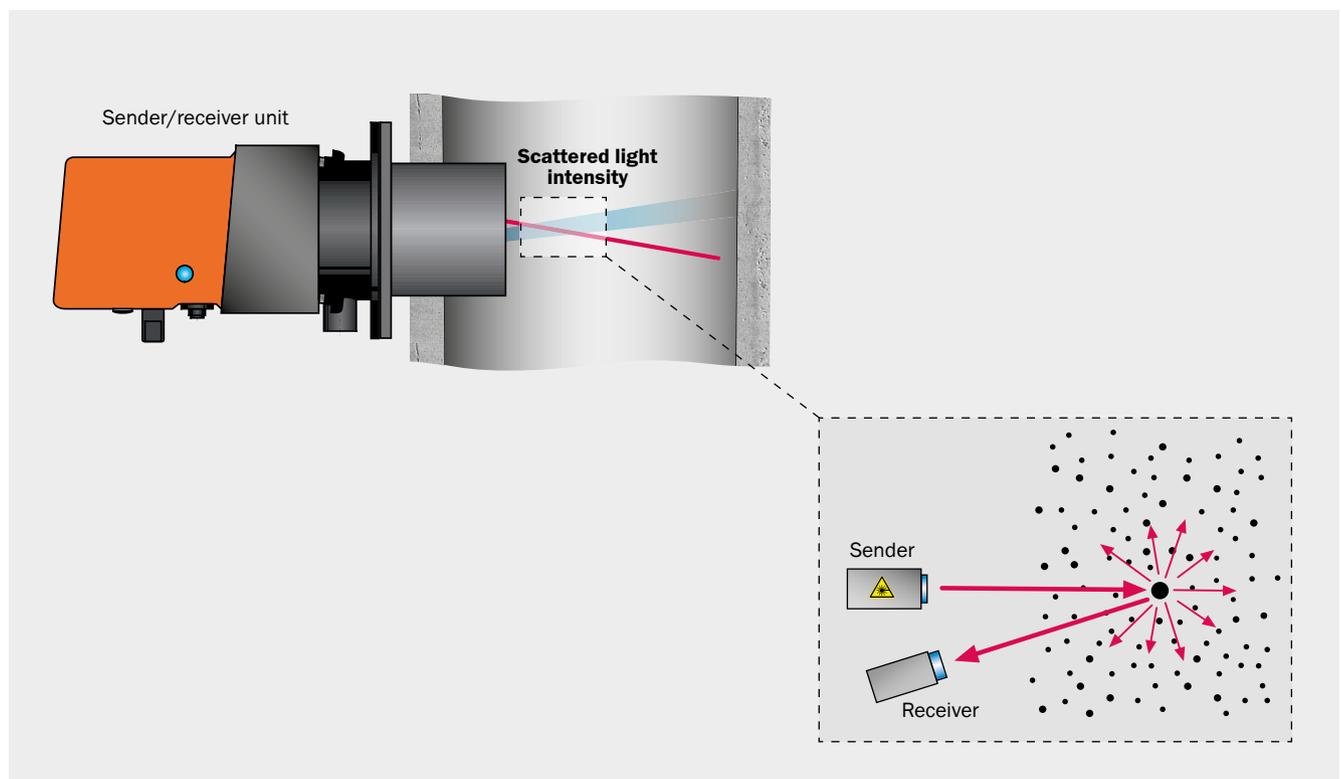
A light sender transmits light which is scattered in the gas mixtures by the particles and recorded by a sensitive receiver. Due to its high sensitivity, the scattered light principle is well-suited for low dust concentrations in particular, even those under 1 mg/m^3 . The overlap of the transmitted beam and the receiver segment defines the measurement volume in the gas channel. The scattered light intensity measured is proportional to the dust concentration and independent of the measure-

ment section. Since the scattered light intensity depends not on the number and size of the particles, but on their optical properties, the measurement system must be calibrated for an exact measurement of dust concentration with a gravimetric comparison measurement.

As one of the leading manufacturers of dust measuring devices, SICK offers measuring devices with both with forwards and reverse light scattering (see graphic).

► Suitable for measuring low to very low dust concentrations.

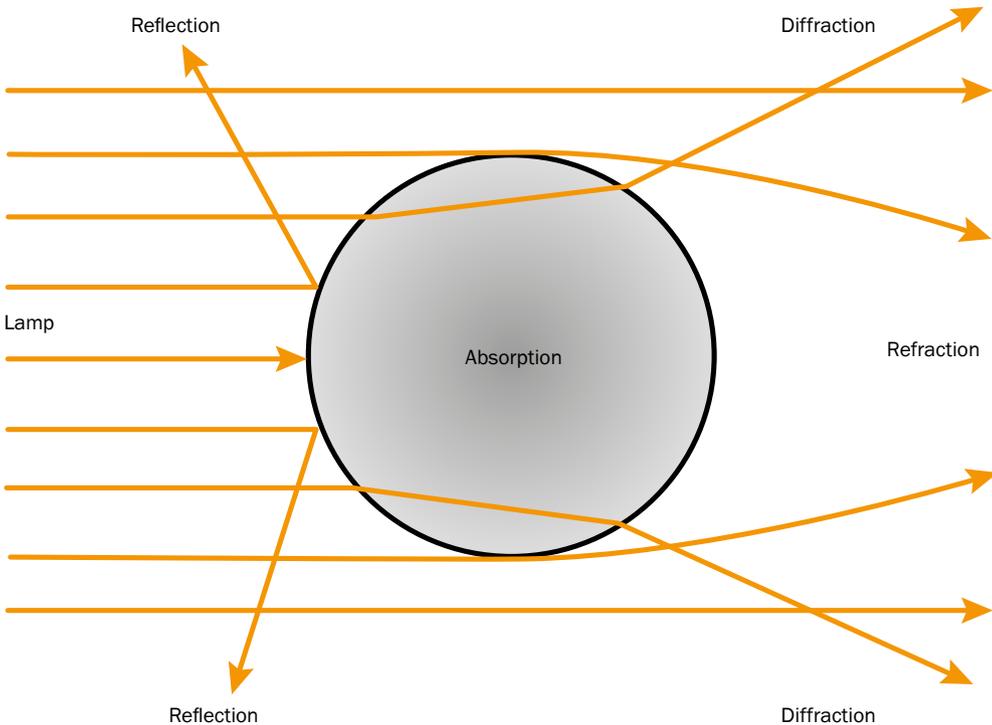
Calculation of the scattered light intensity



Other continuous measurement principles

In addition to the proven measurement principles of transmission and scattered light measurement, for instance the triboelectric or beta-radiation measurement principle are used. However, these come in part with considerable disadvantages. In addition to possible influences by the gas velocity, electric charge and the moisture content of the particles, they can also cause extra effort for separators or probe contamination.

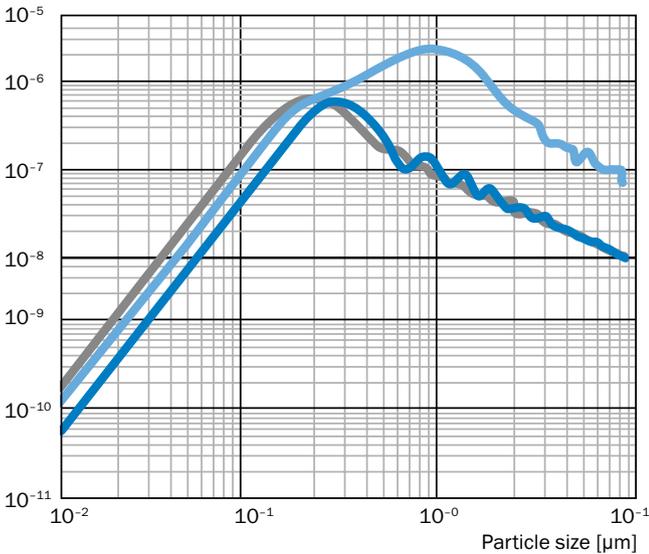
Principle of light scatter on particles



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Scattered light intensity depending on the particle size

Scattered light intensity [W/m²]



The scattered light intensity is proportional to the dust concentration at a given particle size.

DISCONTINUOUS DUST MEASUREMENT PRINCIPLE

Gravimetric determination of the dust concentration is the reference method which complies with guideline DIN EN 13284-1 for calibrating all continually measuring devices.

Gravimetric analysis

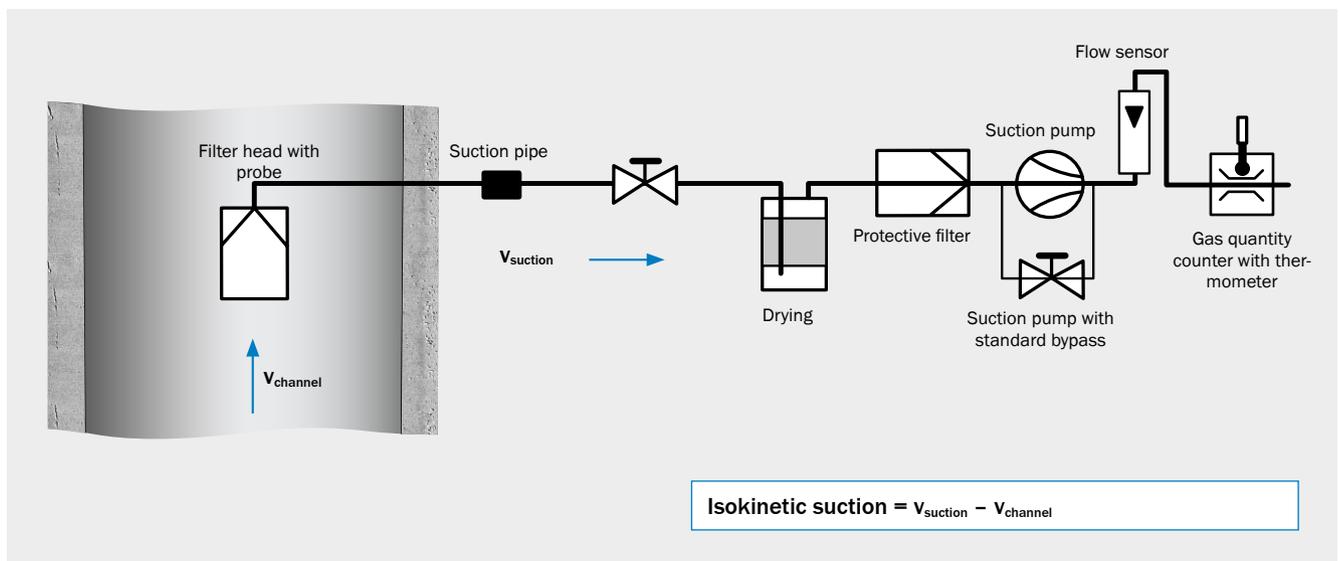
The gravimetric principle is based on the following measurement steps:

1. Isokinetic suction of a partial gas flow at a representative measurement point as a basic prerequisite
2. Collection of the particles on or in a filter element
3. Weighing of the filter before and after suction and calculation of the pure particle mass
4. Calculation of dust concentration from the particle mass and suctioned volume
5. Measurement of the gas velocity and gas temperature

B

▶ Continuously measuring devices are well-suited for collecting reference values for calibration.

Basic structure of sampling equipment in accordance with VDI 2066



Normalizing measured values

Since the measurement values of a measurement system are determined at a wide range of operating conditions (temperature, pressure, humidity, O₂ content), they must be converted to standardized values for comparison purposes.

$$C_{i.B.} = \frac{100 - H_2O [\%]}{100} \cdot \frac{273.15}{273.15 + T [^{\circ}C]} \cdot \frac{1013 + \Delta P [mbar]}{1013} \cdot C_{i.N.}$$

$$C_{i.N.} = \frac{100}{100 - H_2O [\%]} \cdot \frac{273.15 + T [^{\circ}C]}{273.15} \cdot \frac{1013}{1013 + \Delta P [mbar]} \cdot C_{i.B.}$$

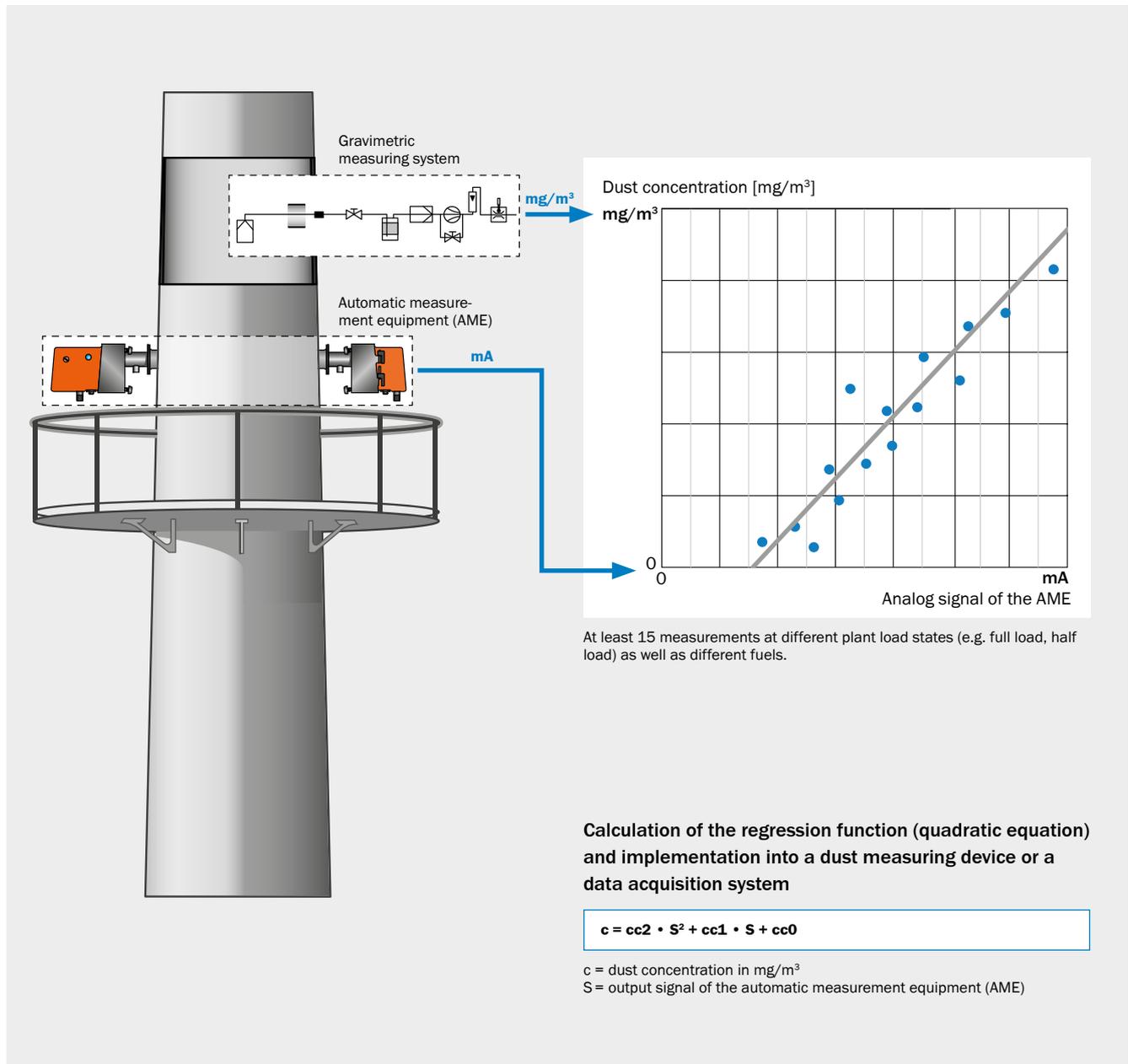
C_{i.B.} = dust concentration under operating conditions [mg/m³]

C_{i.N.} = dust concentration under standard operating conditions [mg/Nm³]

Calibration of the measurement on-site

There is no continuous method which can directly measure the dust concentration without reference material. Gravimetric comparison measurement is required for calibration. This measurement determines the dust concentration at the measurement site under different load conditions of the plant and using different fuels. A calibration curve results from the measured

values of the measurement equipment (AME) and the measured values determined by gravimetry. The procedure for this is defined in Europe by standards EN 14181 and EN 13284-1. At least 15 value pairs must be identified for the calibration.



Calculation of the regression function (quadratic equation) and implementation into a dust measuring device or a data acquisition system

$$c = cc2 \cdot S^2 + cc1 \cdot S + cc0$$

c = dust concentration in mg/m^3
 S = output signal of the automatic measurement equipment (AME)

SERVICE FOR ALL YOUR SYSTEM AND MEASUREMENT SYSTEM REQUIREMENTS

B



Analyzers and measurement systems supply monitoring and control-relevant information and protect people and systems. When optimally integrated and maintained, these components and systems guarantee safe processes, constant product quality and protect people and the environment. From the outset and over many years, SICK LifeTime Services provide suitable services for all aspects of your measurement systems and plants: from planning and conception to commissioning and ongoing operations, all the way to conversions and upgrades. Over 60 years of experience in the field and industrial expertise makes us a competent partner for the specific requirements of our customers.

Modular service contracts – flexible for every requirement

An important part of LifeTime Services from SICK is the modular service concept, which allows every business to create its own individual service contract from different service modules.

Assured productivity – at all times

As an operator with SICK as your experienced and competent service partner, you can fully concentrate on your core business and on increasing productivity, efficiency, and earnings.

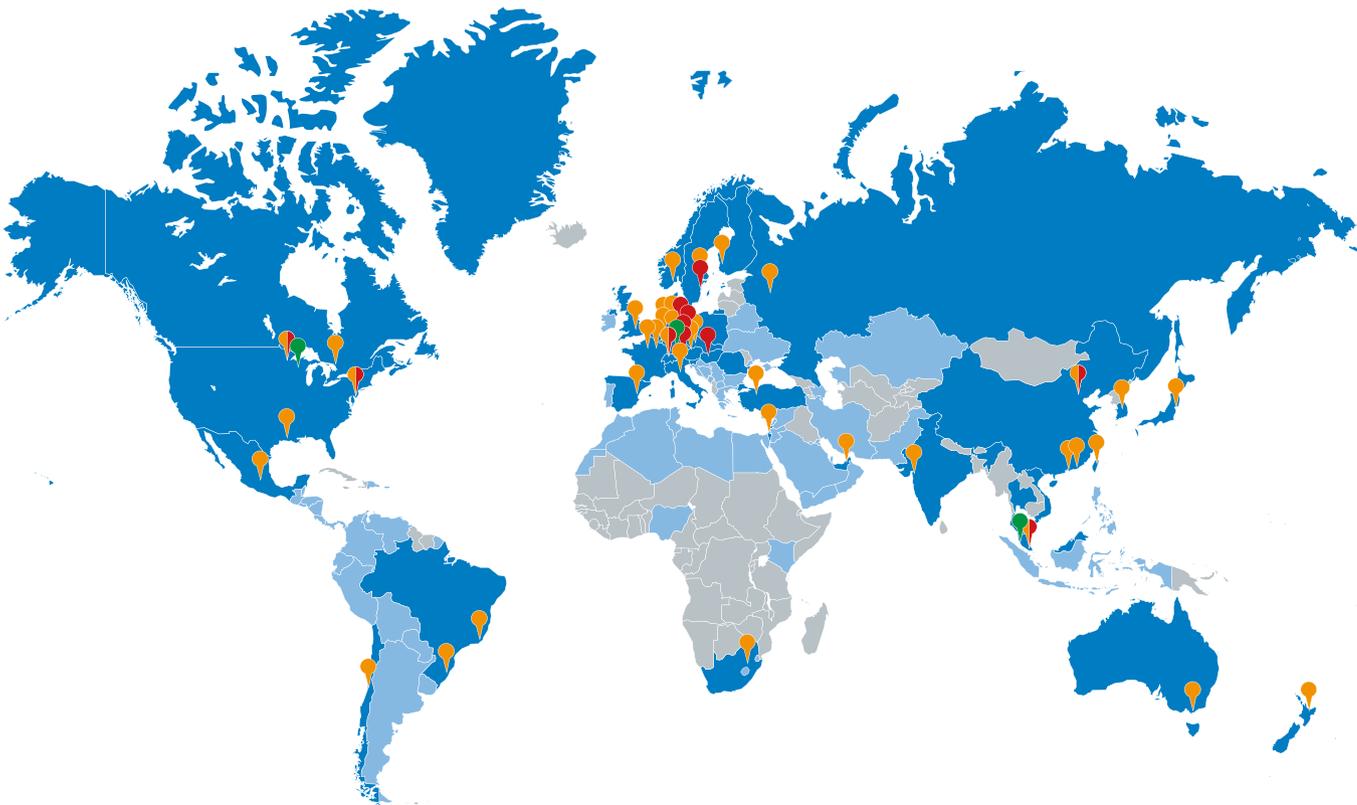
Performance, availability, and security

We are happy to give you advice on which service components are right for you. We work with you to put together a service contract adapted to your requirements using various standardized modules.

Always close by – short distances save time and money

With over 200 service employees in more than 80 countries, SICK ensures that servicing and spare parts are available globally at all times. Remote maintenance by the SICK Meeting Point Router also ensures that the measurement technology works reliably.

B



- Subsidiaries
- Sales offices
- Sales / Service
- Production / R&D
- Regional Competence Center

AN OVERVIEW OF OUR SERVICES

B



Consulting and design



Consulting and planning

SICK offers comprehensive support for your measuring task in accordance with official requirements. We guide you through the entire life cycle of your measurement system and support you in selecting new measurement technology.

Training and education



Training

For reliable operation and maintenance of your measuring devices, SICK offers training catered to your needs: from on-site briefing and product training, all the way to customer-specific workshops.

Verification and optimization



Maintenance

Regular, professional maintenance ensures long service life and low wear. You receive quick, expert support from experienced technicians, which ensures a high rate of availability. If needed, defective components are repaired or replaced.

Test gas management

In combination with maintenance, the supply of necessary test gases plays a vital role. SICK organizes the provision of necessary test gases for a service call.

Repair

SICK performs preventive maintenance tasks before a fault occurs in a measuring device due to wear or a failure in one of its modules.

Service contracts

Individual services in a service contract with SICK can be designed according to your requirements. We consult you based on our experience and determine the maintenance intervals together with you. You automatically receive our maintenance service when you need it.

Inspection

The condition of your system is assessed and the causes of wear determined, which yields the necessary consequences for future use. Regular inspection of your analysis system maintains the availability and productivity of your plant.

Extended warranty

To supplement the statutory warranty period, SICK can offer an extended warranty that is valid for up to five years as part of a service contract.

Product and system support



On-call service

You can reach our service specialists around the clock as needed. If service is needed, we send a service technician within the response time agreed upon in the Service Level Agreement.

Technical support

If you have technical questions or issues related to use or operation, contact one of our experts by phone. Thanks to a 24/7 service level agreement, they can be reached around the clock.

Remote maintenance – SICK Remote Service

Complex systems and increasing cost pressures demand proactive service and optimized maintenance costs. Secure Internet connections enable expert support with just a click: no travel time and setup time needed.

Mounting and commissioning

From laying electrical and pneumatic cables and mounting devices on-site to setting the device parameters with subsequent training, SICK offers a one-stop solution.

Factory repairs

Repairs on devices are carried out directly on the device manufacturer's premises and these devices are subjected to the same quality assurance measures as new devices. Due to increased demands on availability, SICK offers express repairs or provides replacement devices.

Replacement devices

SICK offers suitable replacement devices during downtimes for your measuring devices. These replacement devices are commissioned on-site by our service technicians.

Factory Acceptance Test (FAT)

In the Factory Acceptance Test, experienced SICK technicians inspect devices and systems for completeness. By customer request, we can also jointly perform a function test. You receive the documented test results in the form of either a test log or an acceptance log.

QAL3 support

SICK guides you through the QAL3 procedure for your measurement system and, in doing so, checks the accuracy, linearity and drift of the zero points and reference points of the device curve at least once during the maintenance interval.

Adjustment

If impermissible deviations are found on the emission measurement systems or the devices for industrial instrumentation that are in use, then these items must be readjusted. SICK implements these measures for you using suitable test equipment and reference materials.

Calibration

Emission measurement systems must be calibrated every three years (QAL2). SICK can take over the complete service in compliance with the legal provisions and through collaboration with a measuring institute permitted to perform the measurement.

Functional test

Emission measurement systems must be inspected once a year in accordance with EN 14181 including testing of the calibration function by means of standard reference methods. SICK takes over the complete service and coordinates the necessary steps with your supervisory authority.

B

Upgrade and retrofits



Upgrade service

Regular updates to the device software and evaluation systems ensure the availability of the measurement system over the long term. This can occur through remote maintenance, within scheduled time frames or as an event-controlled process.

Spare part management

We will work with you to create an optimal spare part strategy for your measurement task. Whether the spare parts are stocked on your premises or at a SICK location depends on the availability requirements. If needed, we can deliver the necessary spare parts for your plant within 24 hours.

EMISSION MONITORING

Environmental regulations stipulate that certain pollutants in the flue gases emitted by industrial plants, as well as the reference values, must be continuously monitored. The requirements are country-specific. In many countries, the emission measurement technology must be performance-tested, for example according to EN 15267 in Europe or in compliance with EPA standards in the U.S. With its extensive product portfolio overview, SICK offers reliable solutions for emission monitoring tasks.

Typical fields of application

Emissions are typically measured on or in the stacks or chimneys of industrial plants. The typical fields of application for continuous emission monitoring of dust concentrations are in:

- Power
- Cement plants
- Waste incineration plants
- Steel industry plants
- Chemical plants



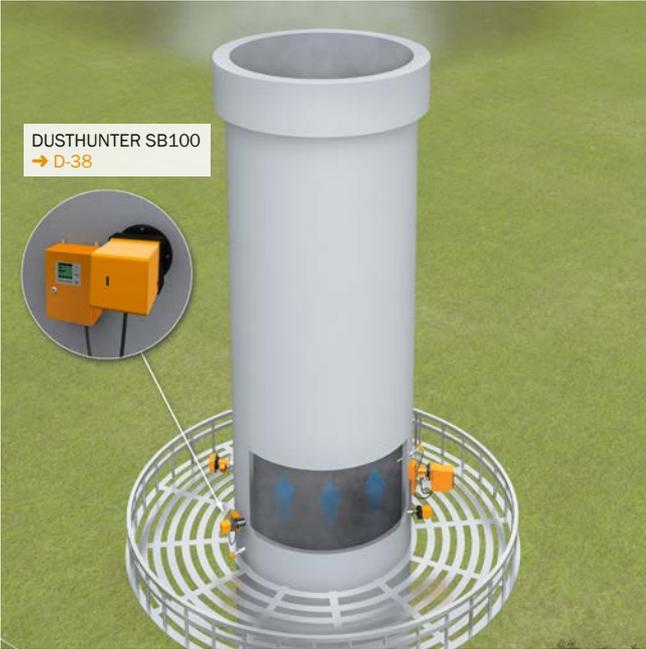
Emission measurements in dry and wet exhaust gases

Combustion plants play an important role in the process chain in many industrial processes. Continuous measuring devices are used at several points in the manufacturing process. These industrial plants set very high demands on measuring devices for emission monitoring, e.g. in relation to the composition, temperature and dampness of the exhaust gases. Depending on the medium of the dust removal system and

Measurement of dry exhaust gases

Thanks to elaborate exhaust gas purification plants, today only low dust loads are output into the environment by stacks and chimneys. The innovative dust measuring devices from SICK play a decisive role in ensuring that this is done reliably in accordance with legal regulations for low limit values and the high requirements of the operating entities.

Continuous measurement of very low to very high concentrations, representative measurement results with very high availability for small and large channel diameters, attachment on only one side - SICK always provides the right solution with the high-precision DUSTHUNTER SB100 or DUSTHUNTER SP100.



system operation, the water or acid dew point can be undercut. Corrosion of the measuring device components which come into contact with exhaust gas is the result. Measurement tasks are necessitated in which both wet and dry exhaust gases have to be measured with extreme precision as well as with the highest possible availability and low maintenance effort.

Measurement of wet exhaust gases

In facilities for applications such as waste treatment or metal processing, waste gases are purified by scrubbers. However, they are usually significantly cooled and saturated with water, causing them to pose a particular challenge for the dust measuring device. In this case, it is also essential for the permitted dust limits to be reliably and accurately monitored.

The FWE200DH dust measuring device from SICK was designed for exactly this measuring task. The gas is extracted via a sampling probe and heated above dew point. Any droplets in the gas are vaporized, making it impossible for them to falsify the measurement results. The scattered light principle enables even very low dust concentrations to be measured.



MEASUREMENT OF VERY LOW DUST CONCENTRATIONS DOWNSTREAM OF CLOTH OR BAG FILTERS

Plants for dust removal of exhaust gases play a key role in complying with air purification requirements in many industrial sectors. In addition to the recovery of material, the main task of dust filter plants is to protect the environment from dust emissions. In order to comply with the permissible limit values as well as for operational reasons, regularly monitoring such filter plants for proper function is necessary. Defects should be detected early and quickly and be eliminated with a low amount of effort.

Safe filter monitoring

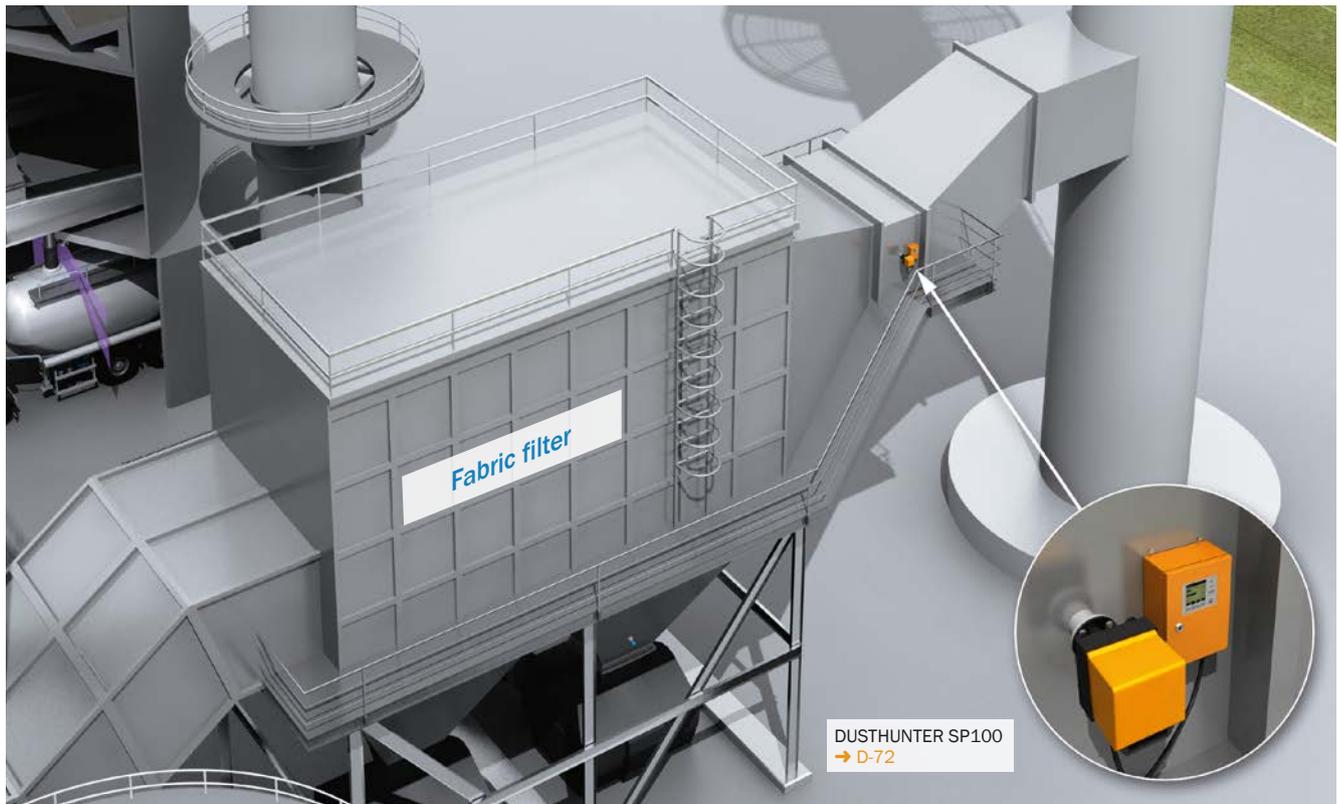
Filter bags have a limited operating time. Over time, small damaged areas develop which grow rapidly during operation and can lead to dust breaking through to the clean gas. Dust measuring devices installed in the clean gas flow downstream of the surface filters are used for the early detection of such damages and initiate the replacement of the affected bag(s). The quicker and more sensitive the measuring device is in reacting to changes in dust concentration, the safer the operation of the plant regarding dust breakthrough and compliance with limit values.

The DUSTHUNTER SP100 is perfectly suited for this task. It can be very easily mounted on only one side of the exhaust gas stack on the clean gas side of a surface filter. Thanks to the probe, mechanical adjustment and alignment to a particle-free measurement section is unnecessary.

Filter monitoring in sync with cleaning

It is very important for the operating entity of dust removal and filter plants to detect a filter defect early and before the permissible limit values are exceeded. It is also necessary to localize a defective bag or group of bags in the filter system so only this bag or group needs replacing. The dust measuring device attached in the clean gas channel downstream of the filter plant must also detect the dust concentration in sync with the cleaning process in order to fulfill this measuring task. Filter defects can be detected in the affected filter group by the occurrence of an emission peak (above the base emission).

The FW102 dust measuring device reliably masters exactly this challenge.



MEASUREMENT OF HIGH DUST CONCENTRATIONS IN RAW GAS UPSTREAM OF THE ELECTRIC FILTER

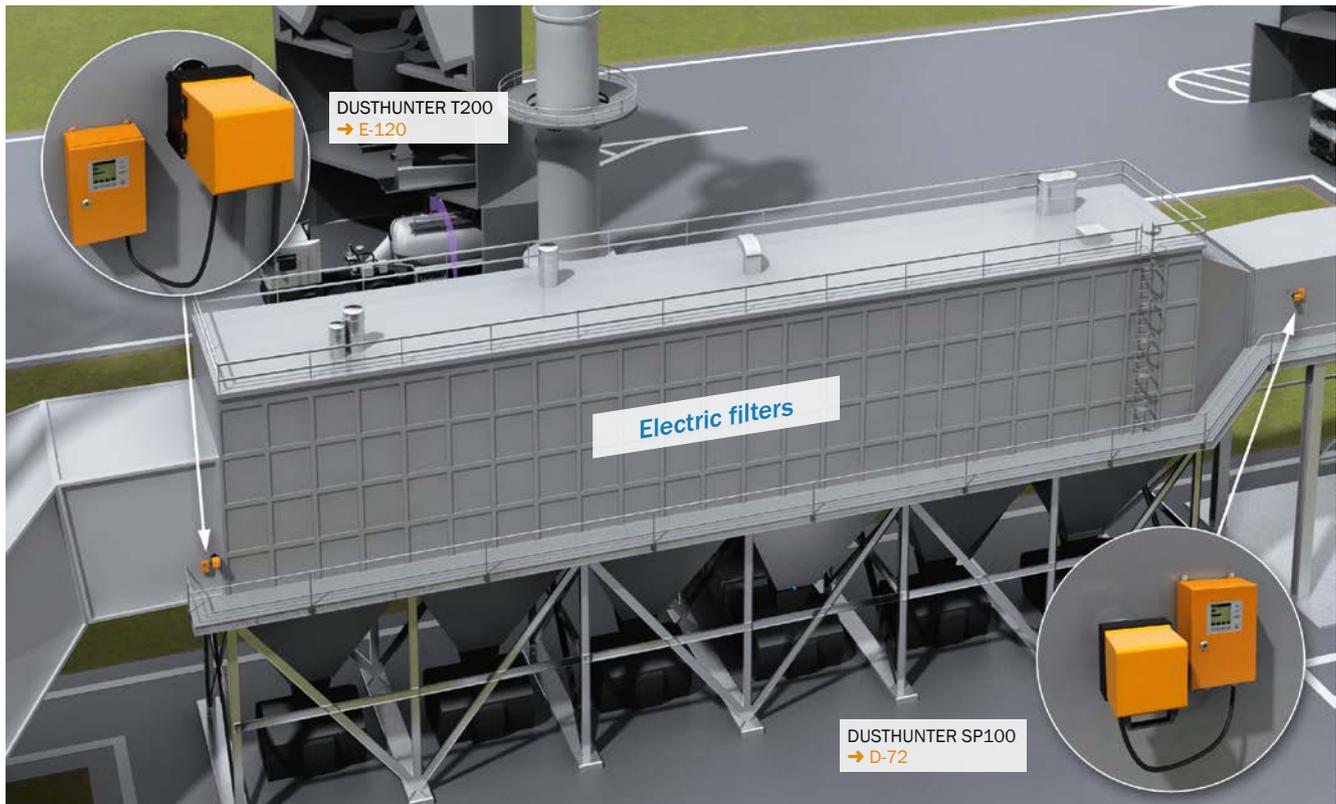
In the electric filter, the process gas is purified from dust particles. The initially high dust concentration of up to 20 g/m^3 is reduced to an average of 15 mg/m^3 . In doing so, the particles are charged by an electrical field and adhere to so-called collecting electrodes due to electric forces of attraction. The electrodes are automatically dusted down at regular intervals. The particles then fall into a collecting tank and can be disposed of. The filter efficiency must be monitored constantly to ensure that the following process steps are performed safely and optimally and that the electric filter is used economically.

Efficient monitoring of electric filters

The dust concentration is continuously measured directly behind the electric filter to ensure efficient control of filter performance and function monitoring. The dust measuring device used must reliably detect increased dust concentrations caused by filter malfunctions so that appropriate countermeasures can be taken. A particular challenge is the often rectangular shape of the gas channel. The channel can warp due to temperature fluctuations, causing the optical axis of the dust measuring device to swivel. The measurement results will be faulty if suitable corrective measures are not taken.

SICK provides the proven DUSTHUNTER T200 for many installations in order to prevent this. Equipped with an automatic self-alignment system, it balances out any channel warping and gives out reliable measurement results at all times. Combined with a dual contamination measurement system, the DUSTHUNTER T200 has a six-month maintenance interval and therefore results in only very low operating costs for the system operator.

C



ADDITIONAL APPLICATIONS FOR EFFECTIVE DUST MEASUREMENTS

In addition to challenging emission measurements and effective filter monitoring systems, the versatile dust measuring devices from SICK stand the test in many other fields of work.

Hall air monitoring

Factory halls in which different types of dust are output must be reliably monitored for reasons of personnel and occupational safety. Dust measuring devices from SICK detect and measure even fine dusts with particle sizes in the μm range. Dust measuring devices can precisely detect extreme dust formation from shredders even in open quarry halls.

Stockpile monitoring

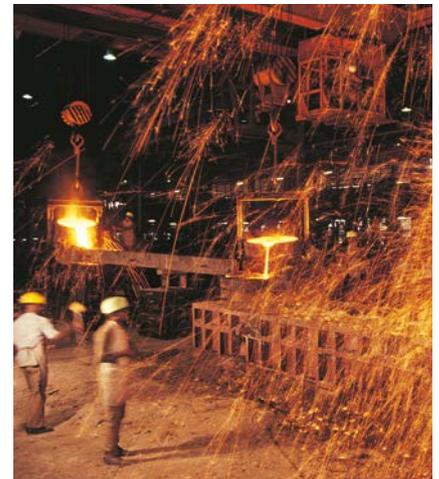
When storing dusty goods outside, not insignificant dust emissions can result from gusts of wind, for example. The handling and transport processes at coal heaps, sand treatment plants or dusts stored outside are typically emission-relevant.

SICK also offers optimal products for the efficient dust measurement of a wide range of requirements for this area of application.

Process control

Precise and reliable dust measurements can optimize process control even when monitoring material transport in pipes or similar processes. Other fields of applications are air or gas monitoring processes upstream of gas turbines.

C



C



SCATTERED LIGHT DUST MEASURING DEVICES

The reliable way to detect low dust concentrations

Light scattering by dust particles is a measurement principle that allows even very low concentrations of dust to be detected. Depending on the system-specific requirements, either forward scattering or reverse scattering can be used in this context.

Both measurement principles deliver stable and reproducible measurement results. Independent of gas velocity, humidity, or dust particle charges.

Your benefits

- Safe and reliable detection of dust concentrations, even if extremely low
- Easy to install and commission
- User-friendly operation
- Long maintenance intervals thanks to automatic self-monitoring
- Status-dependent maintenance message
- Measurement not dependent on gas velocity, humidity, or dust particle charges

D



Product family overview D-34



DUSTHUNTER SB100 D-38
The type approved dust measuring device with reverse scattered light measurement



DUSTHUNTER SB50 D-46
The dust measuring device with reverse scattered light measurement



DUSTHUNTER SB30 D-54
Continuous measurement of low and moderate dust concentrations



DUSTHUNTER SF100 D-62
Dust measuring device in cross-duct version with forward scattered light measurement



DUSTHUNTER SP100 D-72
Probe design with forward scattered light measurement



FWE200DH D-82
Reliable dust measurement in wet gases



FW101 Ex D-88
Effective monitoring of dust concentrations in Ex-zone with scattered light



FW102 D-96
Effective monitoring of dust concentrations with scattered light

D

PRODUCT FAMILY OVERVIEW

	 <p>DUSTHUNTER SB100</p>	 <p>DUSTHUNTER SB50</p>	
	The type approved dust measuring device with reverse scattered light measurement	The dust measuring device with reverse scattered light measurement	

Technical data overview

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity	-
Measurement principles	Scattered light reversed	Scattered light reversed
Process temperature	-40 °C ... +600 °C	-40 °C ... +600 °C
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa Other pressure ranges on request With external purge air unit: -50 hPa ... 30 hPa	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa
Channel diameter	≥ 0.5 m	≥ 0.5 m
Conformities	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU	-
Enclosure rating	IP 66	IP 66
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 20%; fault at 30% Manual linearity test using reference filter	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter

At a glance

	<ul style="list-style-type: none"> • For very low to moderate dust concentrations • One-sided installation • Contamination check • Automatic check of zero and reference point • Automatic compensation of background radiation, therefore no light absorber required • For moderate to large duct diameters 	<ul style="list-style-type: none"> • For low to moderate dust concentrations • One-sided installation • Automatic check of zero and reference point • Automatic compensation of background radiation, therefore no light absorber required • For moderate to large duct diameters 	
Detailed information	→ D-38	→ D-46	

D



DUSTHUNTER SB30

Continuous measurement of low to very low dust concentrations



DUSTHUNTER SF100

Dust measuring device in cross-duct version with forward scattered light measurement



DUSTHUNTER SP100

Probe design with forward scattered light measurement

	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
	-	Scattered light intensity	Scattered light intensity
	Scattered light reversed -40 °C ... +600 °C	Scattered light forward -25 °C ... +300 °C	Scattered light forward DHSP-T2xx standard version: -40 °C ... +220 °C DHSP-T4xx high temperature version: -40 °C ... +400 °C
	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa	With MCU-P control unit: -50 hPa ... 10 hPa With external purge air unit: -50 hPa ... 30 hPa With instrument air (from customer): -50 hPa ... 100 hPa
	≥ 0.5 m	With DHSF-R0 scattered light receiver: 0.5 m ... 3 m With DHSF-R1 scattered light receiver: 2.5 m ... 6 m	≥ 0.25 m
	TÜV type examination, China EPA compliant	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU, U.S. EPA PS-11 compliant
	IP 66	IP 66	IP 66
	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 20%; fault at 30% Manual linearity test using reference filter	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter
	<ul style="list-style-type: none"> For low to moderate dust concentrations Easy one-sided installation Automatic check of zero and reference point For moderate to large duct diameters 	<ul style="list-style-type: none"> For very low to moderate dust concentrations Contamination check Automatic check of zero and reference point For moderate to large duct diameters 	<ul style="list-style-type: none"> One-sided installation For very low to moderate dust concentrations Automatic check of zero and reference point Contamination check Hastelloy probe available for corrosive gases For low to moderate channel diameters
	→ D-54	→ D-62	→ D-72

D

PRODUCT FAMILY OVERVIEW



Technical data overview	
Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity, dust concentration
Measurement principles	Scattered light forward
Process temperature	PVDF sensor: 0 °C to +120 °C Hastelloy sensor: 0 °C to +220 °C
Process pressure	With SLV4 purge air unit 2BH1300: -20 hPa ... 20 hPa With SLV4 purge air unit 2BH1400: -40 hPa ... 40 hPa
Channel diameter	≥ 0.5 m
Conformities	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, U.S. EPA PS-11 compliant
Enclosure rating	System: IP 54 Control unit: IP 65
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter

At a glance	
	<ul style="list-style-type: none"> • For very low to moderate dust concentrations • Gas sampling and return combined in one probe • Contamination check • Automatic check of zero and reference point • Easy configuration and convenient operation, optionally via an additional remote display • Integrated system monitoring for early determination of maintenance needs
Detailed information	→ D-82

D



FW101 Ex

Effective monitoring of dust concentrations in Ex-zone with scattered light



FW102

Effective monitoring of dust concentrations with scattered light

Scattered light intensity, dust concentration (according to gravimetric comparison measurement)	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
-	Dust concentration
Scattered light forward	Scattered light forward
Standard version: -40 °C ... +220 °C High temperature version: -40 °C ... +400 °C	-20 °C ... +220 °C
With external purge air unit: -50 hPa ... 30 hPa With instrument air (from customer): -50 hPa ... 100 hPa	With connecting unit with integrated purge air supply: -50 hPa ... 10 hPa With external purge air unit: -50 hPa ... 70 hPa With instrument air (from customer): -50 hPa ... 100 hPa
≥ 0.25 m	≥ 0.15 m
-	TA-Luft, 27.BImSchV, EN 14181
Sender/receiver unit: IP 66 Connecting unit: IP 65	IP 65
Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter	Automatic control cycle for zero and span point

- Automatic check of zero and reference point
- Contamination check
- Optional evaluation unit for remote operation
- Device versions for Ex-zone 1, 2 and 22

→ D-88

- Automatic check of zero and reference point
- Optional evaluation unit for connection and remote maintenance of up to three FW102 measuring devices

→ D-96

D

THE TYPE APPROVED DUST MEASURING DEVICE WITH REVERSE SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER SB100 is a type-approved measuring device designed to detect very low to moderate dust concentrations in challenging applications, such as in hot or volatile gases. The measurement method is based on the reverse scattering of light. The installation need only be carried out on one side

of a channel, with two possible penetration depths, and background radiation is automatically compensated for, meaning no light absorber is required. Automatic testing of zero point and reference point is built in to the device, as is a soiling check.

At a glance

- For very low to moderate dust concentrations
- One-sided installation
- Contamination check
- Automatic check of zero and reference point
- Automatic compensation of background radiation, therefore no light absorber required
- For moderate to large duct diameters

Your benefits

- Easy installation, commissioning, and operation
- Measurement not dependent on gas velocity, humidity, or particle load
- Tested for suitability according to EN 15267
- Low-maintenance thanks to self-monitoring



More information

Fields of application	D-39
Detailed technical data	D-39
Ordering information	D-42
Dimensional drawings	D-42
Accessories	D-44

→ www.sick.com/DUSTHUNTER_SB100

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of dust concentrations upstream and downstream of filter systems
- Monitoring of dust load in factory halls
- Control of fresh air and exhaust air units

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SB100 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light reversed
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 10 mg/m ³ / 0 ... 200 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Scattered light intensity 0 ... 100 SI / 0 ... 15 SI / 0 ... 50 SI / 0 ... 200 SI
Setting time (t₉₀)	1 s ... 600 s freely adjustable
Accuracy	≤ 2% of the measuring range limit value
Process temperature	-40 °C ... +600 °C
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa
Process gas humidity	Non-condensing
Channel diameter	≥ 500 mm
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (German Technical Instructions on Air Quality Control) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 20%; fault at 30% Manual linearity test using reference filter

Sender/receiver unit DHSB-T10/-T11

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	265 mm x 274 mm x 691 mm (for details, see dimensional drawings)
Weight	≤ 10 kg

Power supply	Voltage	24 V
		Supply via control unit
	Power consumption	≤ 4 W

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them	
Ambient temperature	-40 °C ... +60 °C	
Enclosure rating	IP 66	
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V
		Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit	
Gas flow rate	≤ 20 m³/h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	



Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)														
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals														
Digital inputs	4 volt-free contacts														
Interfaces and bus protocols	<table border="0"> <tr> <td>Ethernet</td> <td>Modbus TCP (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>OPC (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>Modbus RTU (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>PROFIBUS DP (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>USB</td> <td>SOPAS ET</td> </tr> </table>	Ethernet	Modbus TCP (via optional interface module)	Ethernet	OPC (via optional interface module)	Ethernet	SOPAS ET (via optional interface module)	RS-485	Modbus RTU (via optional interface module)	RS-485	PROFIBUS DP (via optional interface module)	RS-485	SOPAS ET (via optional interface module)	USB	SOPAS ET
Ethernet	Modbus TCP (via optional interface module)														
Ethernet	OPC (via optional interface module)														
Ethernet	SOPAS ET (via optional interface module)														
RS-485	Modbus RTU (via optional interface module)														
RS-485	PROFIBUS DP (via optional interface module)														
RS-485	SOPAS ET (via optional interface module)														
USB	SOPAS ET														
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"														
Operation	Via LC display or SOPAS ET software														
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm														
Weight	≤ 13.5 kg														
Power supply	<table border="0"> <tr> <td>Voltage</td> <td>90 ... 250 V Version with 24 V DC available as an option</td> </tr> <tr> <td>Frequency</td> <td>47 to 63 Hz</td> </tr> <tr> <td>Power consumption</td> <td>≤ 70 W</td> </tr> </table>	Voltage	90 ... 250 V Version with 24 V DC available as an option	Frequency	47 to 63 Hz	Power consumption	≤ 70 W								
Voltage	90 ... 250 V Version with 24 V DC available as an option														
Frequency	47 to 63 Hz														
Power consumption	≤ 70 W														
Auxiliary gas connections	Purge air														
Options	Interface module(s) I/O module(s)														

SLV4-2 purge air unit, 2BH1300, 3-ph

Description	Unit for providing dust-free air for purging optical surfaces		
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter		
Ambient temperature	-20 °C ... +40 °C		
Enclosure rating	IP 54		
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)		
Weight	18 kg		
Power supply	<table border="0"> <tr> <td>3-phase current</td> <td>3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W</td> </tr> </table>	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
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Auxiliary gas connections	Purge air: 40 mm		
Test functions	Low-pressure monitor (switching point -35 hPa)		
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g		

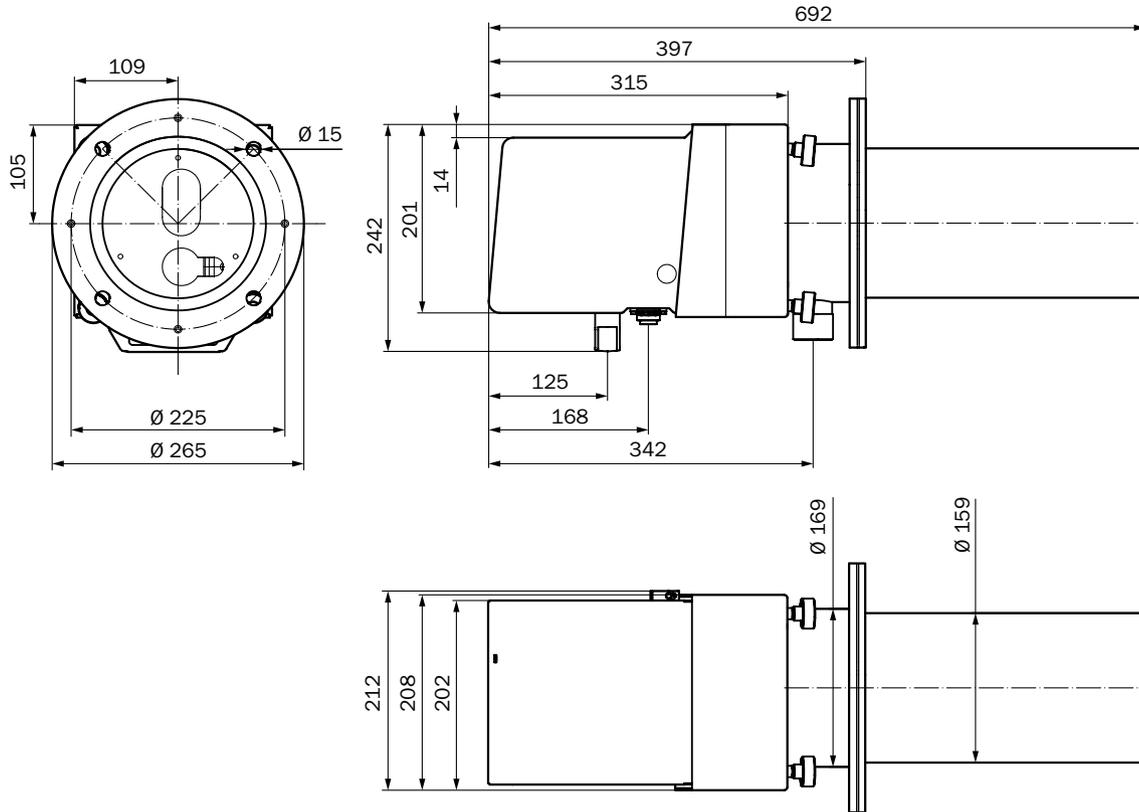


Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

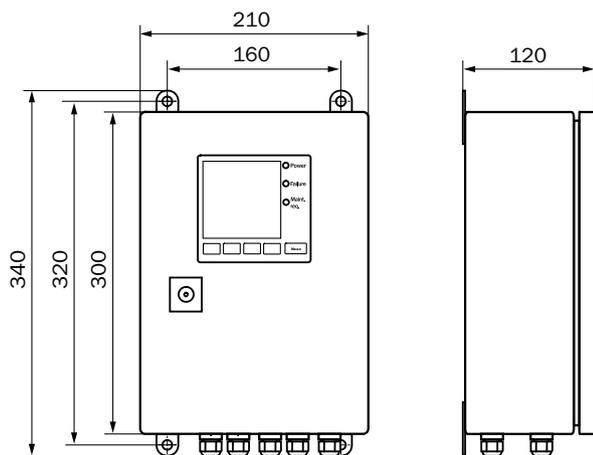
Dimensional drawings (dimensions in mm)

Sender/receiver unit DHSB-T10/-T11

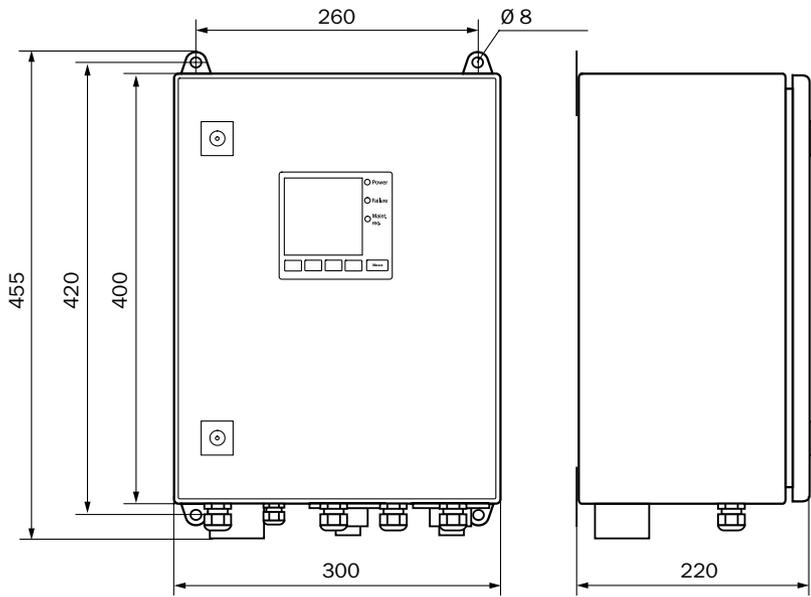


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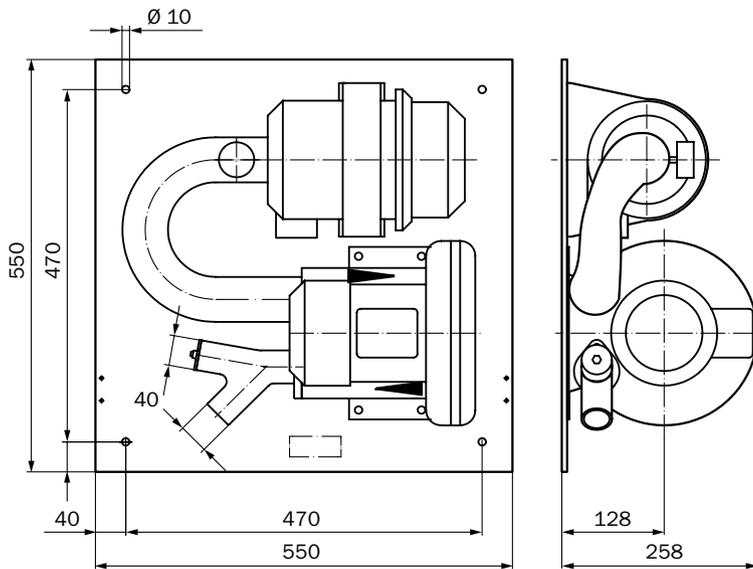
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



D

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2042339

Sets und kits

Brief description	Part no.
RM210 replacement set consisting of: 1.0037 steel adapter flange, adapter plate, mounting kits for mounting flanges, seals, screws, small spare parts kit, flange rework drawing, information document	2050331

Flanges

Weld-in flange

- **Interior diameter:** 195 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.4571 stainless steel	350 mm	225 mm	M12	2047288
Flange with tube, 1.0037 structural steel	350 mm	225 mm	M12	2046526
Flange with tube, 1.4571 stainless steel	700 mm	225 mm	M12	2047287
Flange with tube, 1.0037 structural steel	700 mm	225 mm	M12	2046492

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2048657
Weather hood for external blower unit, aluminum, painted	5306108

Other mounting accessories

Miscellaneous

Brief description	Part no.
Mounting set consisting of: cup springs, nuts, washers	2048677

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977



THE DUST MEASURING DEVICE WITH REVERSE SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER SB50 is a measuring device designed to detect low to moderate dust concentrations in challenging applications, such as in hot or volatile gases. The measurement method is based on the reverse scattering of light.

The installation need only be carried out on one side of a channel, with two possible penetration depths, and background radiation is automatically compensated for, meaning no light absorber is required.

At a glance

- For low to moderate dust concentrations
- One-sided installation
- Automatic check of zero and reference point
- Automatic compensation of background radiation, therefore no light absorber required
- For moderate to large duct diameters

Your benefits

- Easy installation, commissioning, and operation
- Measurement not dependent on gas velocity, humidity, or particle load
- Low-maintenance thanks to self-monitoring



More information

Fields of applicationD-47
 Detailed technical data.D-47
 Ordering information.D-50
 Dimensional drawingsD-50
 AccessoriesD-52

→ www.sick.com/DUSTHUNTER_SB50

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Emission monitoring in heating systems
- Monitoring of dust concentrations upstream and downstream of filter systems
- Dust concentration measurements in cement plants

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SB50 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Measurement principles	Scattered light reversed
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 20 mg/m ³ / 0 ... 200 mg/m ³ Higher measuring ranges on request
Setting time (t₉₀)	1 s ... 600 s freely adjustable
Accuracy	± 2% of the measuring range limit value
Process temperature	-40 °C ... +600 °C
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa
Process gas humidity	Non-condensing
Channel diameter	≥ 500 mm
Electrical safety	CE
Test functions	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter

DHSB-T00/-T01 sender/receiver unit

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	265 mm x 274 mm x 691 mm (for details, see dimensional drawings)
Weight	≤ 9 kg
Power supply	Voltage 24 V Supply via control unit
	Power consumption ≤ 4 W

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)

Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display (option) or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit	
Gas flow rate	≤ 20 m³/h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"	



Operation	Via LC display (option) or SOPAS ET software	
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm	
Weight	≤ 13.5 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 70 W
Auxiliary gas connections	Purge air	
Options	Interface module(s) I/O module(s)	

SLV4-2 purge air unit, 2BH1300, 3-ph

Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclon, dust capacity 200 g	

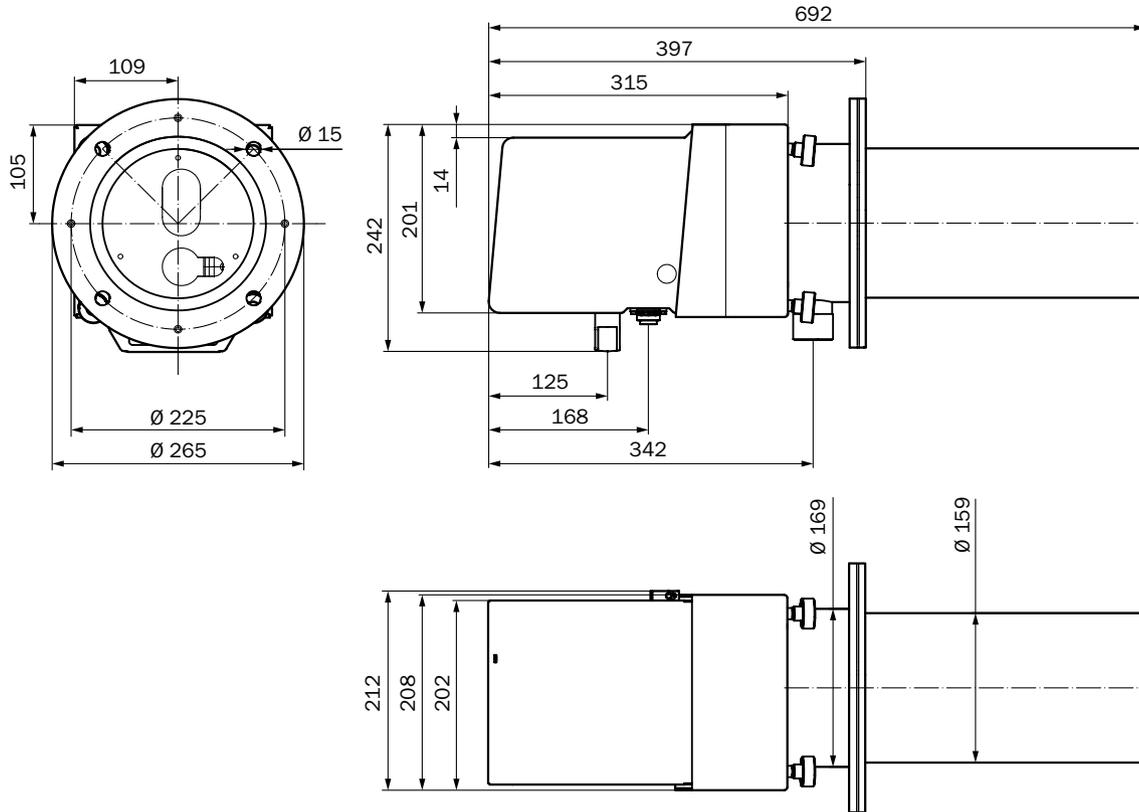


Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

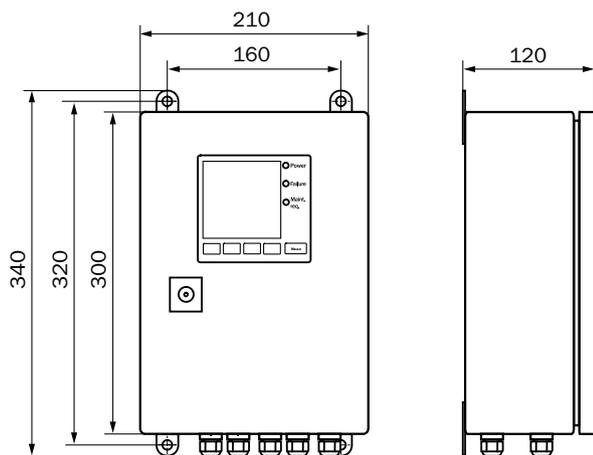
Dimensional drawings (dimensions in mm)

DHSB-T00/-T01 sender/receiver unit

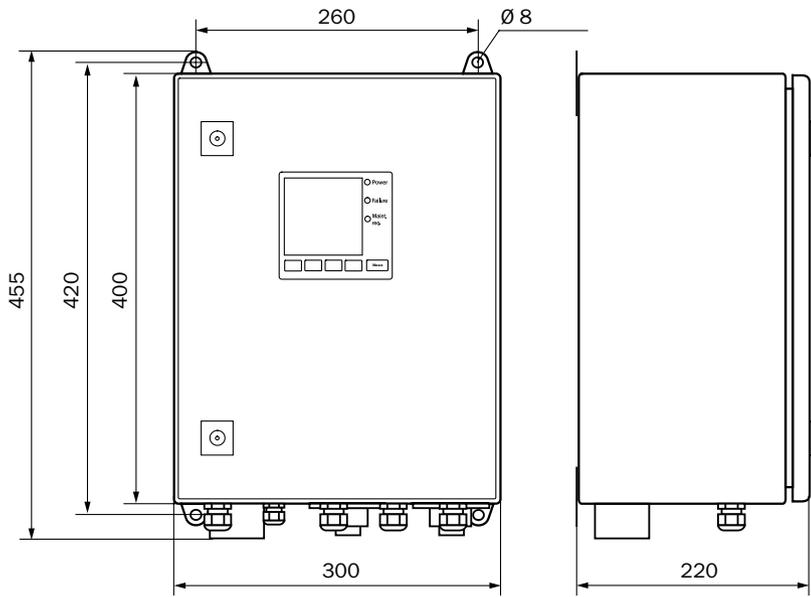


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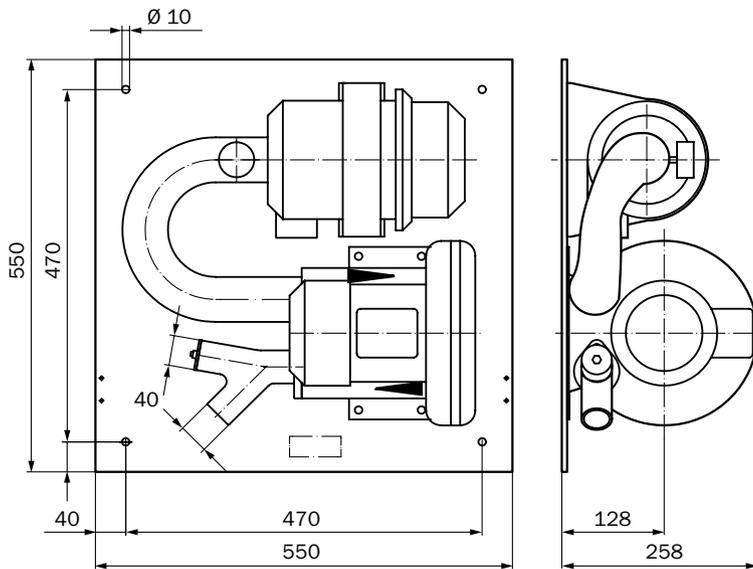
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



D

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2042339

Sets und kits

Brief description	Part no.
RM210 replacement set consisting of: 1.0037 steel adapter flange, adapter plate, mounting kits for mounting flanges, seals, screws, small spare parts kit, flange rework drawing, information document	2050331

Flanges

Weld-in flange

- **Interior diameter:** 195 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.4571 stainless steel	350 mm	225 mm	M12	2047288
Flange with tube, 1.0037 structural steel	350 mm	225 mm	M12	2046526
Flange with tube, 1.4571 stainless steel	700 mm	225 mm	M12	2047287
Flange with tube, 1.0037 structural steel	700 mm	225 mm	M12	2046492

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2048657
Weather hood for external blower unit, aluminum, painted	5306108

Other mounting accessories

Miscellaneous

Brief description	Part no.
Mounting set consisting of: cup springs, nuts, washers	2048677

Plug connectors and cables

Connecting cables with female connector

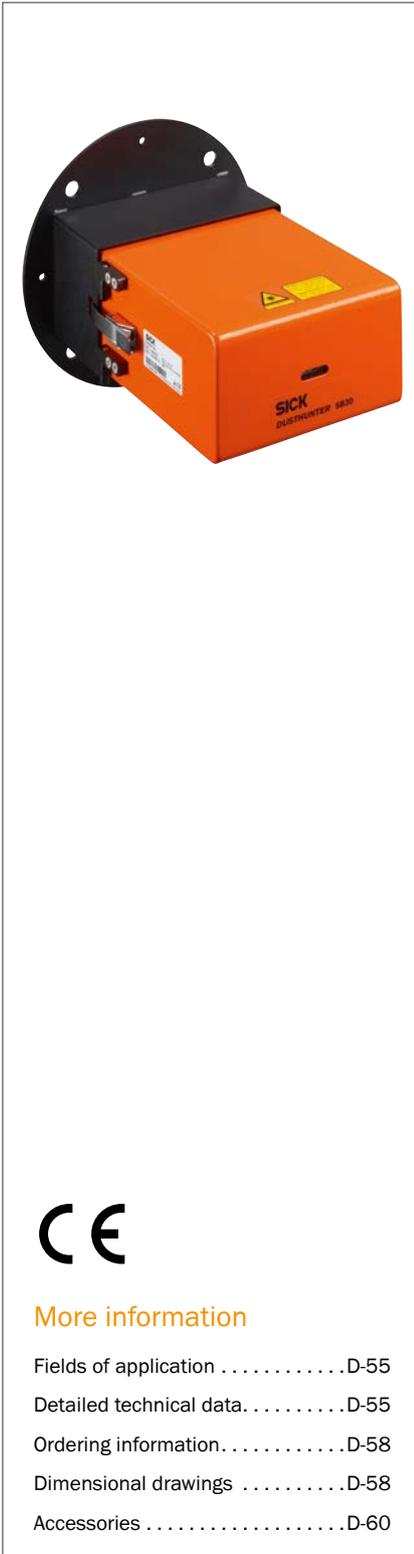
Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977



CONTINUOUS MEASUREMENT OF LOW TO VERY LOW DUST CONCENTRATIONS



Product description

The DUSTHUNTER SB30 is a measuring device designed to detect very low to moderate dust concentrations, such as in hot or volatile gases. Measurement is based on the tried-and-tested measurement principle of reverse light scattering.

Installation is easy and is only carried out on one side of the channel. Two different penetration depths are possible for adapting the measuring device to various channel diameters.

At a glance

- For low to moderate dust concentrations
- Easy one-sided installation
- Automatic check of zero and reference point
- For moderate to large duct diameters

Your benefits

- Easy installation, commissioning, and operation
- Tried-and-tested measurement, not dependent on gas velocity, humidity, or particle load
- Cost-effective thanks to easy mounting on just one side; no alignment necessary
- Very low-maintenance thanks to self-monitoring
- Demand-controlled maintenance notifications



More information

Fields of application	D-55
Detailed technical data	D-55
Ordering information	D-58
Dimensional drawings	D-58
Accessories	D-60

→ www.sick.com/DUSTHUNTER_SB30

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Monitoring of emissions at industrial facilities such as power plants, heating plants, waste incineration plants, in steel production and in cement plants
- Monitoring of dust concentrations upstream and downstream of filter systems
- Measurement of dust concentrations in flue gas ducts upstream and downstream of dust filters

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SB30 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Measurement principles	Scattered light reversed
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Scattered light intensity 0 ... 30 SI / 0 ... 3,000 SI Measuring ranges freely selectable; three measuring ranges preset (0 ... 30/500/3,000 SI)
Setting time (t₉₀)	1 s ... 600 s freely adjustable via SOPAS ET software
Accuracy	± 2% of the measuring range limit value
Process temperature	-40 °C ... +600 °C
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa
Channel diameter	≥ 500 mm
Conformities	TÜV type examination China EPA compliant
Electrical safety	CE
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω
Test functions	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter
Options	MCU control unit SCU control unit External purge air unit

DHSB-T30 sender/receiver unit

Description	Measurement system analyzer unit
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	1 output: 0/4 ... 20 mA, 750 Ω Electrically isolated
Digital outputs	3 relay contacts: 48 V, 1 A for status signals
Digital inputs	2 volt-free contacts: For external maintenance switch, automatic self-test or linearity measurement
Dimensions (W x H x D)	Details, see dimensional drawings
Weight	7 kg

Power supply	Voltage	24 V
		Supply via the MCU control unit or external energy supply
	Power consumption	≤ 4 W

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them	
Ambient temperature	-40 °C ... +60 °C	
Enclosure rating	IP 66	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display (option) or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V
		Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit	
Gas flow rate	≤ 20 m³/h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	



Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)														
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals														
Digital inputs	4 volt-free contacts														
Interfaces and bus protocols	<table border="0"> <tr> <td>Ethernet</td> <td>Modbus TCP (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>OPC (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>Modbus RTU (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>PROFIBUS DP (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>USB</td> <td>SOPAS ET</td> </tr> </table>	Ethernet	Modbus TCP (via optional interface module)	Ethernet	OPC (via optional interface module)	Ethernet	SOPAS ET (via optional interface module)	RS-485	Modbus RTU (via optional interface module)	RS-485	PROFIBUS DP (via optional interface module)	RS-485	SOPAS ET (via optional interface module)	USB	SOPAS ET
Ethernet	Modbus TCP (via optional interface module)														
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USB	SOPAS ET														
Display	LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"														
Operation	Via LC display (option) or SOPAS ET software														
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm														
Weight	≤ 13.5 kg														
Power supply	<table border="0"> <tr> <td>Voltage</td> <td>90 ... 250 V Version with 24 V DC available as an option</td> </tr> <tr> <td>Frequency</td> <td>47 to 63 Hz</td> </tr> <tr> <td>Power consumption</td> <td>≤ 70 W</td> </tr> </table>	Voltage	90 ... 250 V Version with 24 V DC available as an option	Frequency	47 to 63 Hz	Power consumption	≤ 70 W								
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Frequency	47 to 63 Hz														
Power consumption	≤ 70 W														
Auxiliary gas connections	Purge air														
Options	Interface module(s) I/O module(s)														

SLV4-2 purge air unit, 2BH1300, 3-ph

Description	Unit for providing dust-free air for purging optical surfaces		
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter		
Ambient temperature	-20 °C ... +40 °C		
Enclosure rating	IP 54		
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)		
Weight	18 kg		
Power supply	<table border="0"> <tr> <td>3-phase current</td> <td>3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W</td> </tr> </table>	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W		
Auxiliary gas connections	Purge air: 40 mm		
Test functions	Low-pressure monitor (switching point -35 hPa)		
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g		

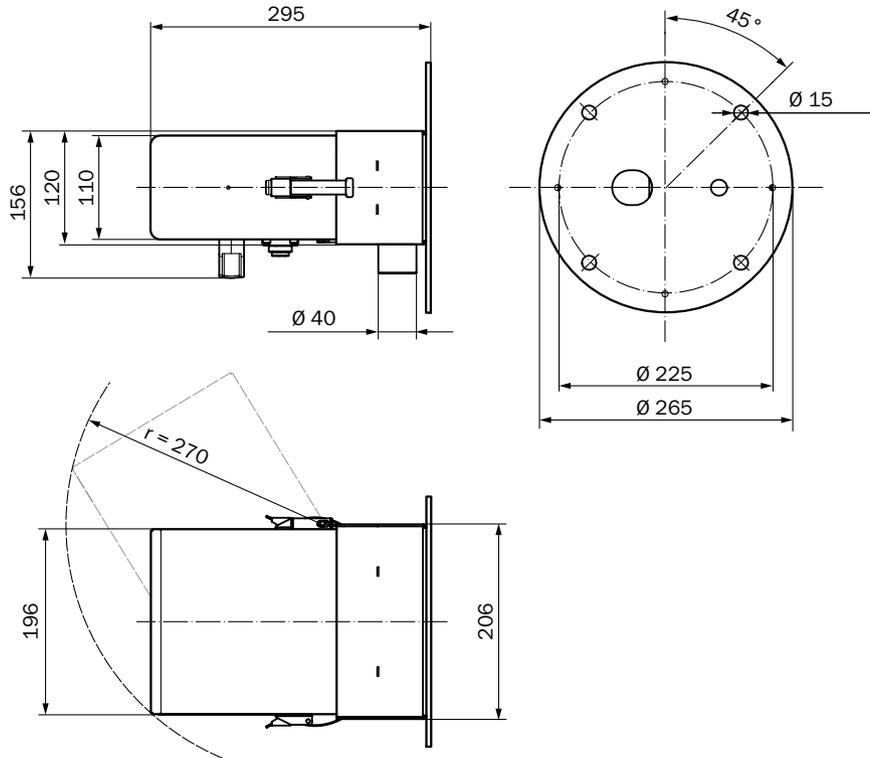


Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

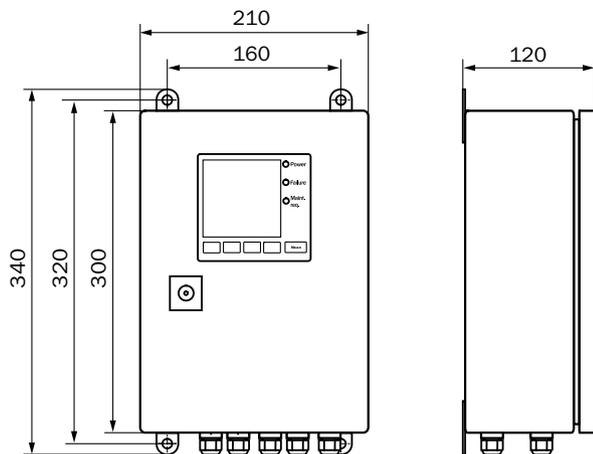
Dimensional drawings (dimensions in mm)

DHSB-T30 sender/receiver unit

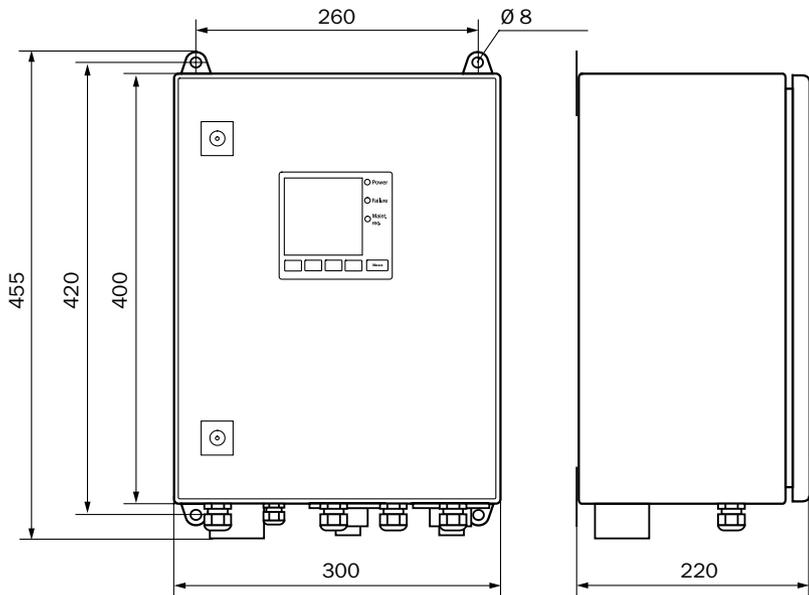


MCU-N control unit; wall housing, compact version (only for non-Ex-zones)

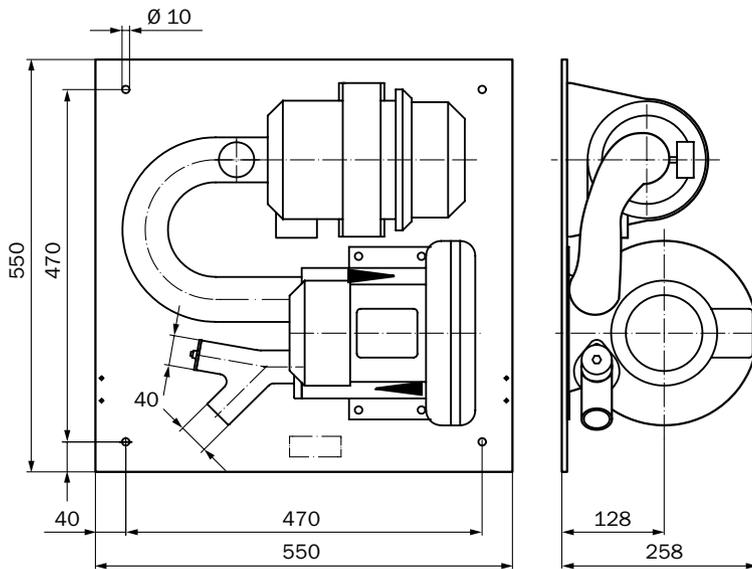
D



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



D

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2042339

Flanges

Weld-in flange

- **Interior diameter:** 195 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.0037 structural steel	350 mm	225 mm	M12	2046526
Flange with tube, 1.4571 stainless steel	700 mm	225 mm	M12	2047287
Flange with tube, 1.0037 structural steel	700 mm	225 mm	M12	2046492
Flange with tube, 1.4571 stainless steel	350 mm	225 mm	M12	2047288

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2048657
Weather hood for external blower unit, aluminum, painted	5306108

Other mounting accessories

Miscellaneous

Brief description	Part no.
Mounting set consisting of: cup springs, nuts, washers	2048677

D

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, 6-wire, 10 m	2043679
Connection cable, 6-wire, 5 m	2043678
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977

D

DUST MEASURING DEVICE IN CROSS-DUCT VERSION WITH FORWARD SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER SF100 is a type-approved measuring device designed to detect very low to moderate dust concentrations. The measurement is based on

the forward scattering of light. Automatic testing of zero point and reference point is built in to the device, as is a soiling check.

At a glance

- For very low to moderate dust concentrations
- Contamination check
- Automatic check of zero and reference point
- For moderate to large duct diameters

Your benefits

- For difficult channel geometries and moderate conditions
- Tested for suitability according to EN 15267
- Low-maintenance thanks to self-monitoring and contamination monitoring



More information

Fields of applicationD-63
 Detailed technical data.D-63
 Ordering information.D-66
 Dimensional drawingsD-66
 AccessoriesD-70

→ www.sick.com/DUSTHUNTER_SF100

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Monitoring of dust load in factory halls

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SF100 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 200 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Scattered light intensity 0 ... 50 SI / 0 ... 5 SI / 0 ... 20 SI / 0 ... 100 SI / 0 ... 200 SI
Setting time (t₉₀)	1 s ... 600 s freely adjustable
Accuracy	≤ 2% of the measuring range limit value
Process temperature	-25 °C ... +300 °C
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa
Process gas humidity	Non-condensing
Channel diameter	With DHSF-R0 scattered light receiver: 0.5 m ... 3 m With DHSF-R1 scattered light receiver: 2.5 m ... 6 m
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (German Technical Instructions on Air Quality Control) EN 15267 EN 14181 MCERTS 2010/75/EU
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 20%; fault at 30% Manual linearity test using reference filter

DHSF-T sender unit

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 429 mm (for details, see dimensional drawings)
Weight	≤ 10 kg
Power supply	Voltage 24 V Supply via control unit
	Power consumption ≤ 17 W

DHSF-R0 receiver unit

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 420 mm (for details, see dimensional drawings)
Weight	≤ 6.5 kg

DHSF-R1 receiver unit

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	265 mm x 308 mm x 550 mm (for details, see dimensional drawings)
Weight	≤ 8 kg

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them	
Ambient temperature	-40 °C ... +60 °C	
Enclosure rating	IP 66	
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	



MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit	
Gas flow rate	≤ 20 m³/h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display or SOPAS ET software	
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm	
Weight	≤ 13.5 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 70 W
Auxiliary gas connections	Purge air	
Options	Interface module(s) I/O module(s)	

SLV4-2 purge air unit, 2BH1300, 3-ph

Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	38 m³/h ... 63 m³/h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W

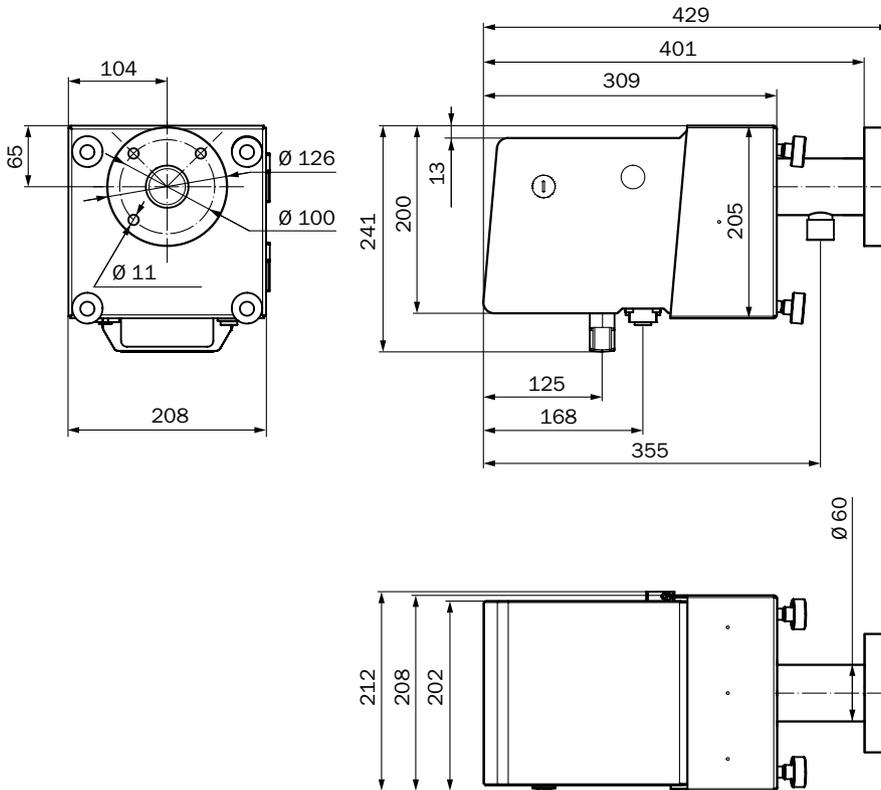
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-level air filter, type Europiclou, dust capacity 200 g

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

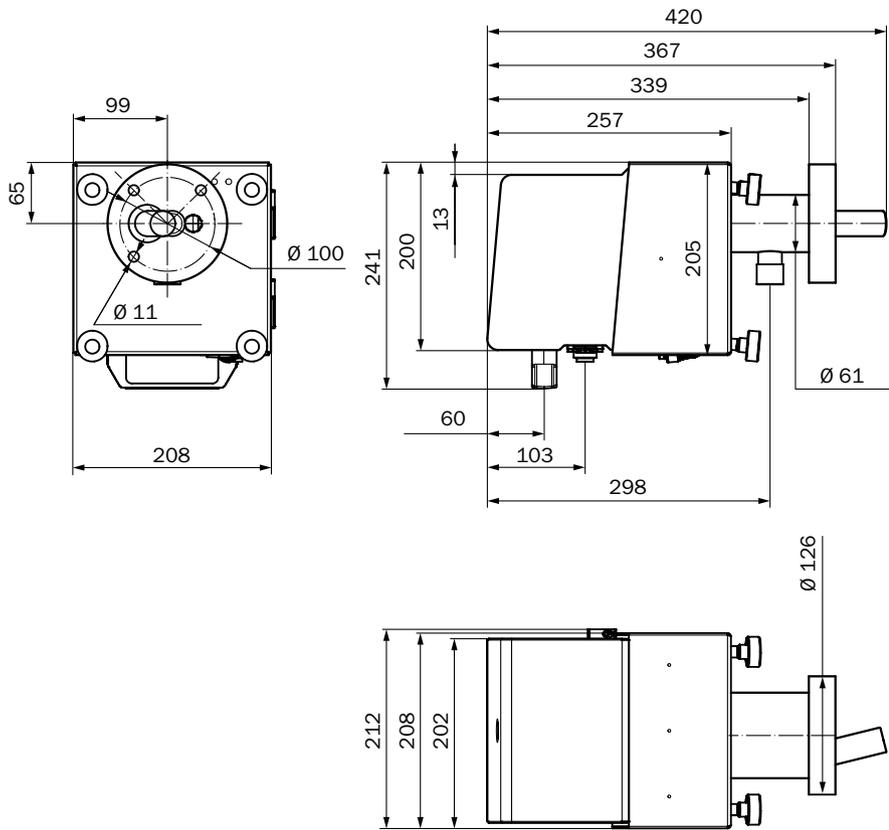
Dimensional drawings (dimensions in mm)

DHSF-T sender unit

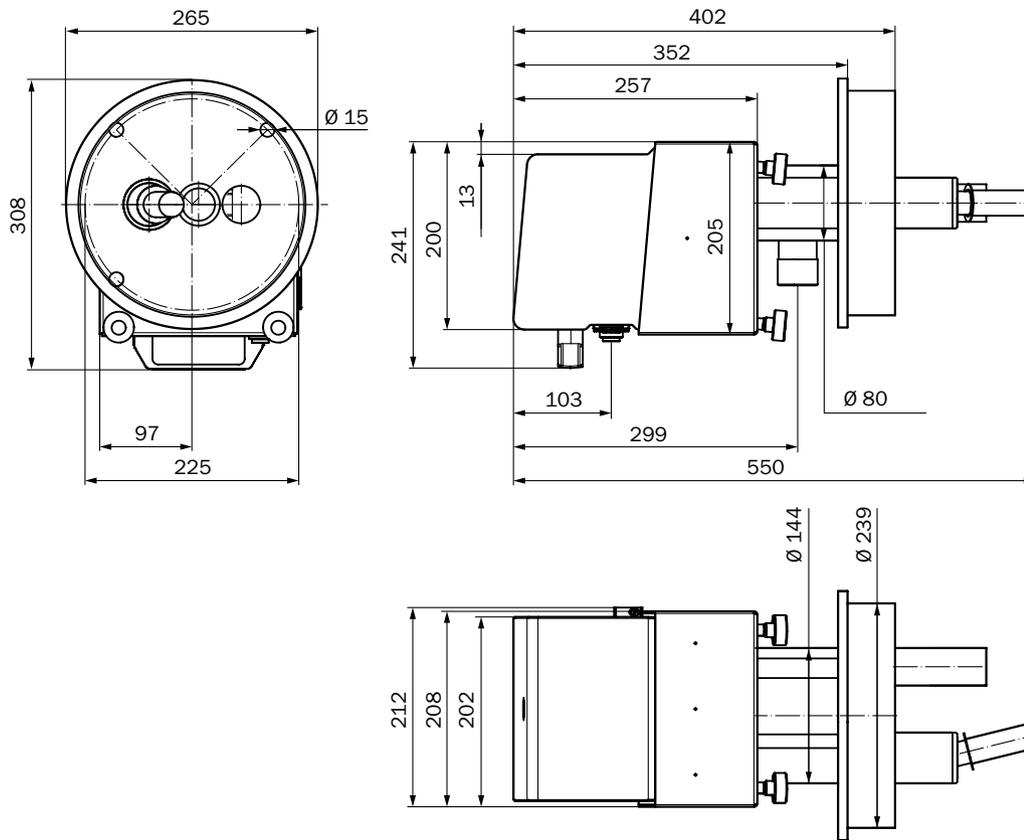


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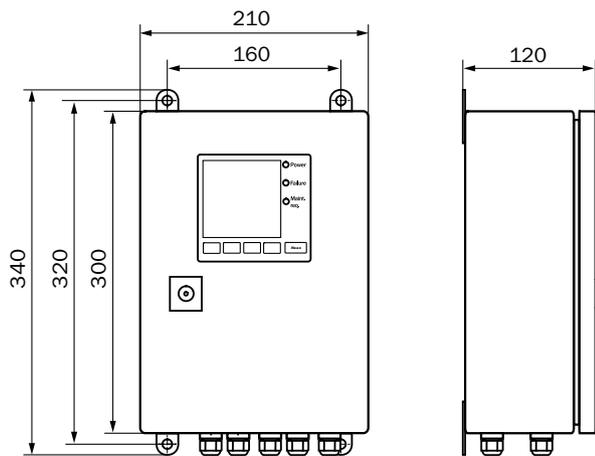
DHSF-R0 receiver unit



DHSF-R1 receiver unit

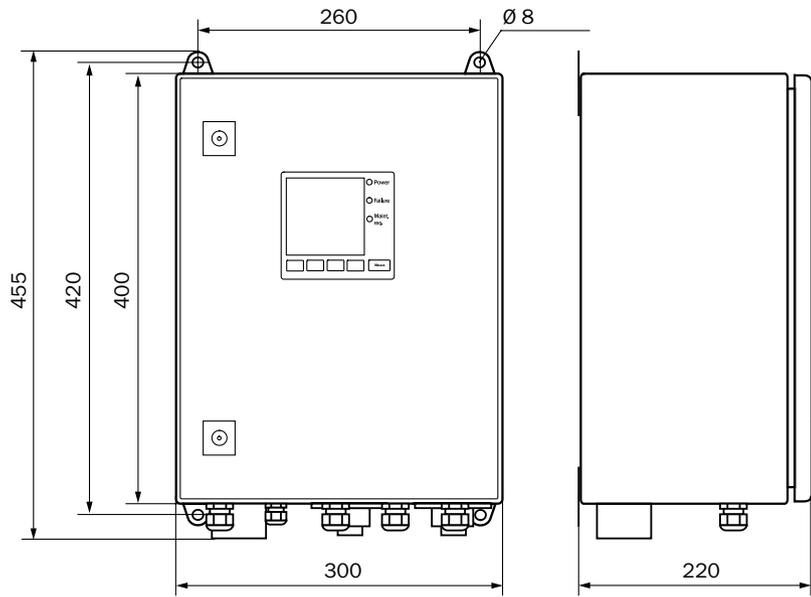


MCU-N control unit; wall housing, compact version (only for non-Ex-zones)

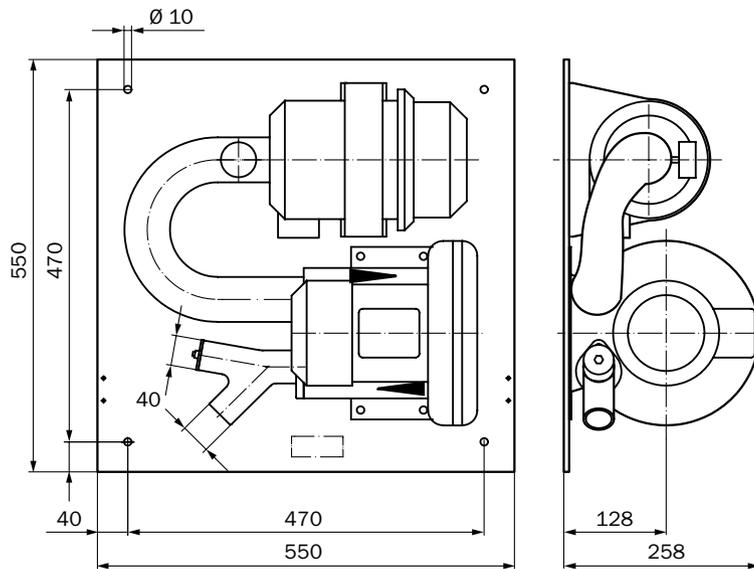


D

MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



D

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2049590

Sets und kits

Brief description	Part no.
Mounting set consisting of: spring plates, spherical washers, nuts	2060477

Flanges

Weld-in flange

Brief description	Nominal length	Interior diameter	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.4571 stainless steel	130 mm	70.2 mm	127 mm	M10	2017846
Flange with tube, 1.0037 structural steel	130 mm	70.2 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	240 mm	70.2 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	240 mm	70.2 mm	100 mm	M10	2017847
	500 mm	70.2 mm	100 mm	M10	2017850
			127 mm	M10	2017849
Flange with tube, including mounting kit, 1.4571 stainless steel	350 mm	152 mm	225 mm	M12	2045420
Flange with tube, including mounting kit, 1.0037 structural steel	350 mm	152 mm	225 mm	M12	2045418
Flange with tube, 1.4571 stainless steel	110 mm	70.2 mm	100 mm	M10	2054536
Flange with tube, 1.0037 structural steel	110 mm	70.2 mm	100 mm	M10	2054535

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Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2048657
	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

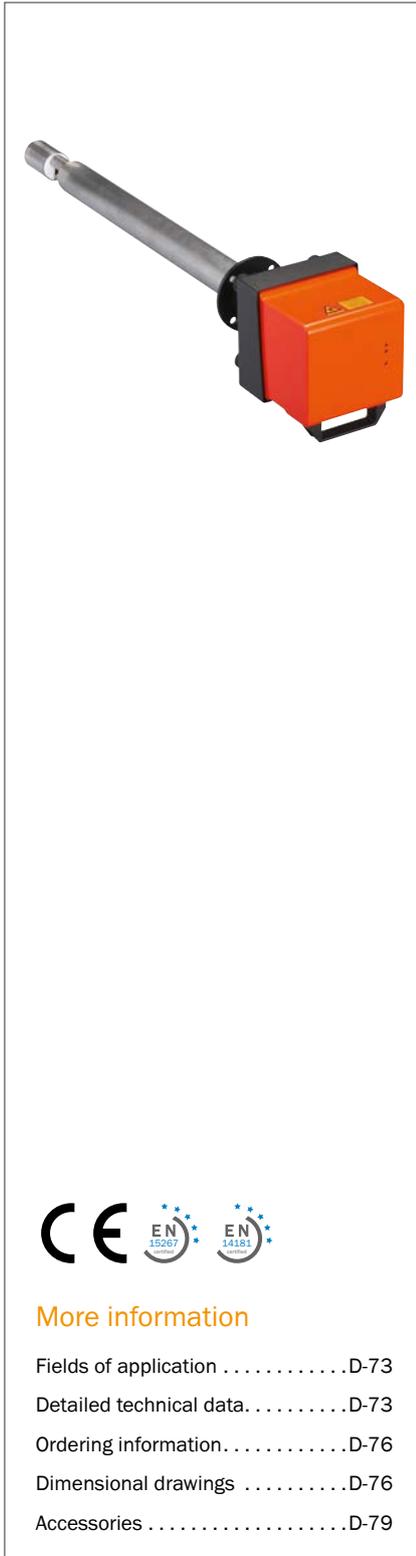
Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977

Connection cables with female and male connector

Brief description	Part no.
Connection cable of sender/receiver unit – reflector, 4-wire, 10 m	2045417
Connection cable of sender/receiver unit – reflector, 4-wire, 20 m	2048674
Connection cable of sender/receiver unit – reflector, 4-wire, 5 m	2045416



PROBE DESIGN WITH FORWARD SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER SP100 is a type-approved measuring device designed to detect very low to moderate dust concentrations with a measuring probe. It is particularly well-suited for thick or dual-walled channels since installation is only

done on one side. The measurement is based on the forward scattering of light. Automatic testing of zero point and reference point is built in to the device, as is a soiling check.

At a glance

- One-sided installation
- For very low to moderate dust concentrations
- Automatic check of zero and reference point
- Contamination check
- Hastelloy probe available for corrosive gases
- For low to moderate channel diameters

Your benefits

- Ideal for thick or dual-walled channels
- Tested for suitability according to EN 15267
- Low-maintenance thanks to self-monitoring and contamination monitoring
- Quick installation since alignment is not necessary



More information

Fields of application	D-73
Detailed technical data	D-73
Ordering information	D-76
Dimensional drawings	D-76
Accessories	D-79

→ www.sick.com/DUSTHUNTER_SP100

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



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Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Measurements in exhaust gas or exhaust air channels

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SP100 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 200 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Scattered light intensity 0 ... 15 SI / 0 ... 5 SI / 0 ... 20 SI / 0 ... 50 SI / 0 ... 100 SI / 0 ... 200 SI
Setting time (t₉₀)	1 s ... 600 s freely adjustable
Accuracy	≤ 2% of the measuring range limit value
Process temperature	DHSP-T2xx standard version: -40 °C ... +220 °C DHSP-T4xx high temperature version: -40 °C ... +400 °C
Process pressure	With MCU-P control unit: -50 hPa ... 10 hPa With external purge air unit: -50 hPa ... 30 hPa With instrument air (from customer): -50 hPa ... 100 hPa High pressure version: -80 kPa ... 200 kPa
Process gas humidity	Non-condensing
Channel diameter	≥ 0.25 m
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (German Technical Instructions on Air Quality Control) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-11 compliant SP100 EX version ATEX 3G
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter

DHSP-Txxx sender/receiver unit

Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	Details, see dimensional drawings

Weight	Nominal length 435 mm: ≤ 6.5 kg Nominal length 735 mm: ≤ 7.8 kg Nominal length 1035 mm: ≤ 9.5 kg Nominal length 1335 mm: ≤ 11 kg
Power supply	
Voltage	24 V Supply via control unit
Power consumption	≤ 4 W

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals
Digital inputs	4 volt-free contacts
Interfaces and bus protocols	
Ethernet	Modbus TCP (via optional interface module)
Ethernet	OPC (via optional interface module)
Ethernet	SOPAS ET (via optional interface module)
RS-485	Modbus RTU (via optional interface module)
RS-485	PROFIBUS DP (via optional interface module)
RS-485	SOPAS ET (via optional interface module)
USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"
Operation	Via LC display or SOPAS ET software
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm
Weight	≤ 3.7 kg
Power supply	
Voltage	90 ... 250 V Version with 24 V DC available as an option
Frequency	47 to 63 Hz
Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit
Gas flow rate	≤ 20 m³/h
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air
Enclosure rating	IP 66

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Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)														
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)														
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals														
Digital inputs	4 volt-free contacts														
Interfaces and bus protocols	<table border="0"> <tr> <td>Ethernet</td> <td>Modbus TCP (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>OPC (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>Modbus RTU (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>PROFIBUS DP (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>USB</td> <td>SOPAS ET</td> </tr> </table>	Ethernet	Modbus TCP (via optional interface module)	Ethernet	OPC (via optional interface module)	Ethernet	SOPAS ET (via optional interface module)	RS-485	Modbus RTU (via optional interface module)	RS-485	PROFIBUS DP (via optional interface module)	RS-485	SOPAS ET (via optional interface module)	USB	SOPAS ET
Ethernet	Modbus TCP (via optional interface module)														
Ethernet	OPC (via optional interface module)														
Ethernet	SOPAS ET (via optional interface module)														
RS-485	Modbus RTU (via optional interface module)														
RS-485	PROFIBUS DP (via optional interface module)														
RS-485	SOPAS ET (via optional interface module)														
USB	SOPAS ET														
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"														
Operation	Via LC display or SOPAS ET software														
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm														
Weight	≤ 13.5 kg														
Power supply	<table border="0"> <tr> <td>Voltage</td> <td>90 ... 250 V Version with 24 V DC available as an option</td> </tr> <tr> <td>Frequency</td> <td>47 to 63 Hz</td> </tr> <tr> <td>Power consumption</td> <td>≤ 70 W</td> </tr> </table>	Voltage	90 ... 250 V Version with 24 V DC available as an option	Frequency	47 to 63 Hz	Power consumption	≤ 70 W								
Voltage	90 ... 250 V Version with 24 V DC available as an option														
Frequency	47 to 63 Hz														
Power consumption	≤ 70 W														
Auxiliary gas connections	Purge air														
Options	Interface module(s) I/O module(s)														

SLV4-2 purge air unit, 2BH1300, 3-ph

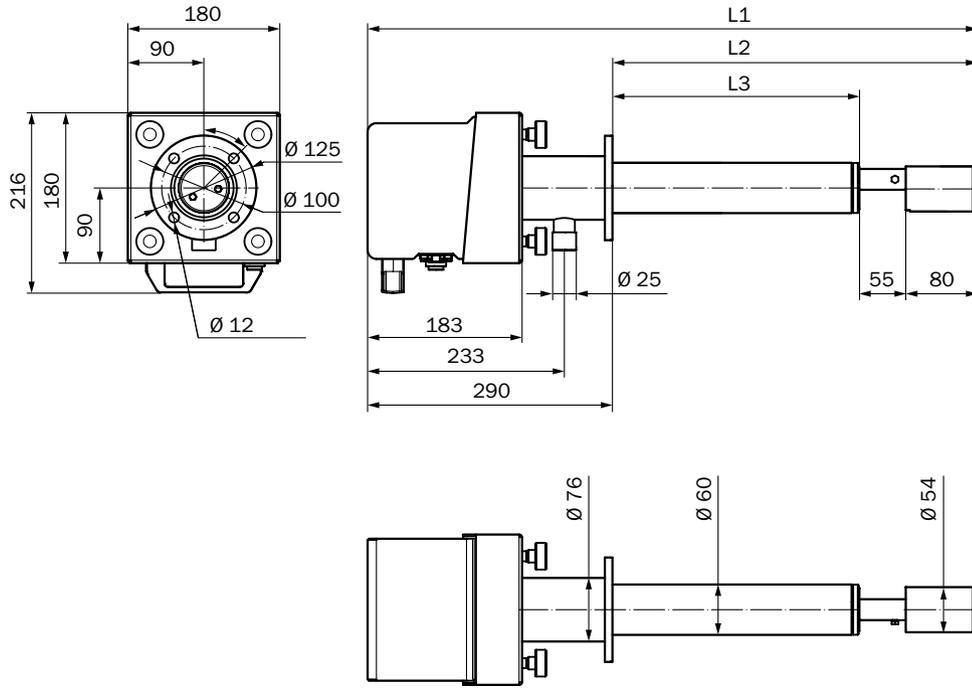
Description	Unit for providing dust-free air for purging optical surfaces		
Gas flow rate	38 m³/h ... 63 m³/h at 30 hPa counterpressure, depending on underpressure in filter		
Ambient temperature	-20 °C ... +40 °C		
Enclosure rating	IP 54		
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)		
Weight	18 kg		
Power supply	<table border="0"> <tr> <td>3-phase current</td> <td>3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W</td> </tr> </table>	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W		
Auxiliary gas connections	Purge air: 40 mm		
Test functions	Low-pressure monitor (switching point -35 hPa)		
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g		

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

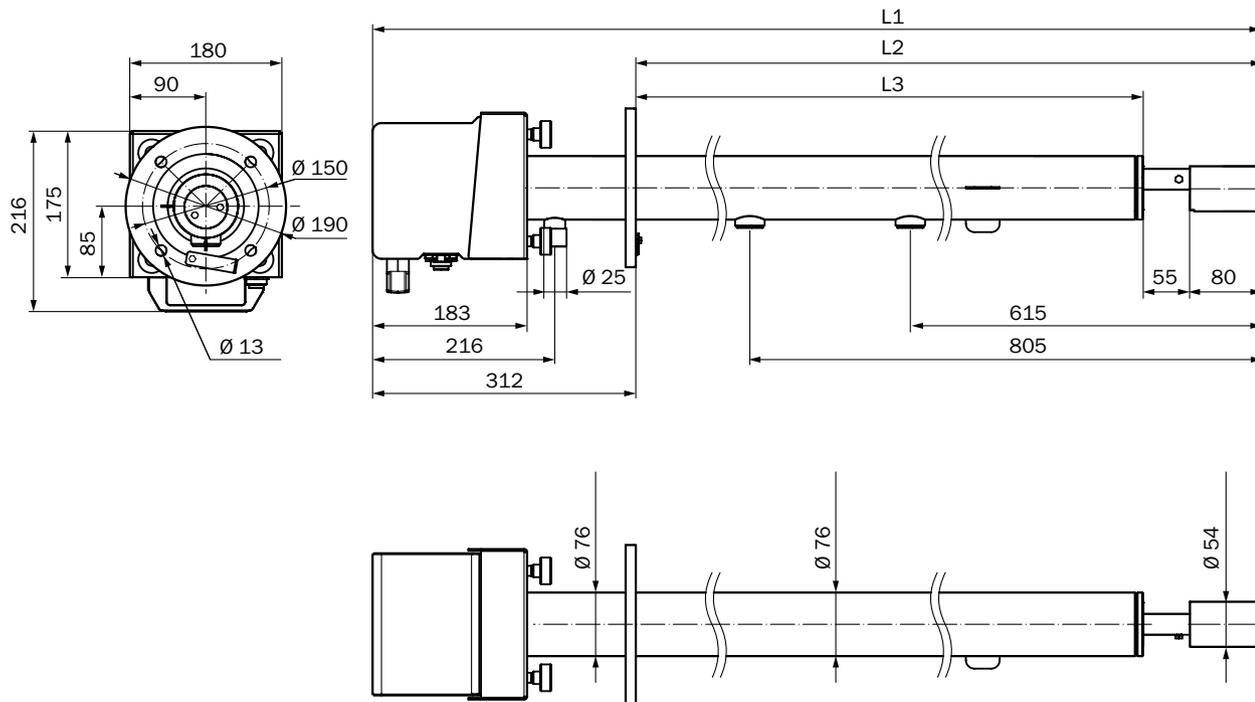
DHSP-Txx1/-Txx2 sender/receiver unit



Sender/receiver unit type	L1	Nominal length of the probe L2	L3
DHSP-Txx1	725	435	300
DHSP-Txx2	1,025	735	600
All dimensions in mm			

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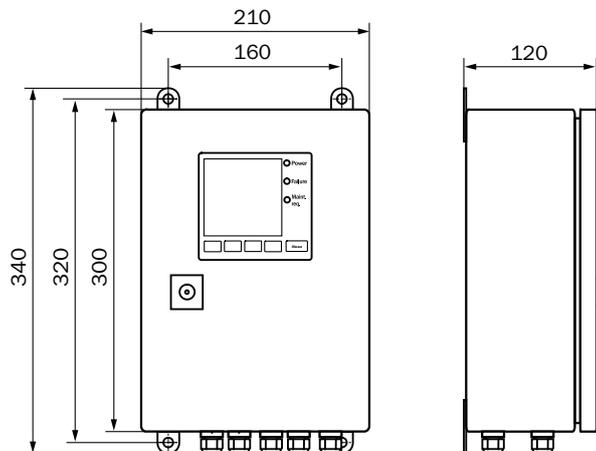
DHSP-Txx3/-Txx4/-Txx5/-Txx6/-Txx7 sender/receiver unit



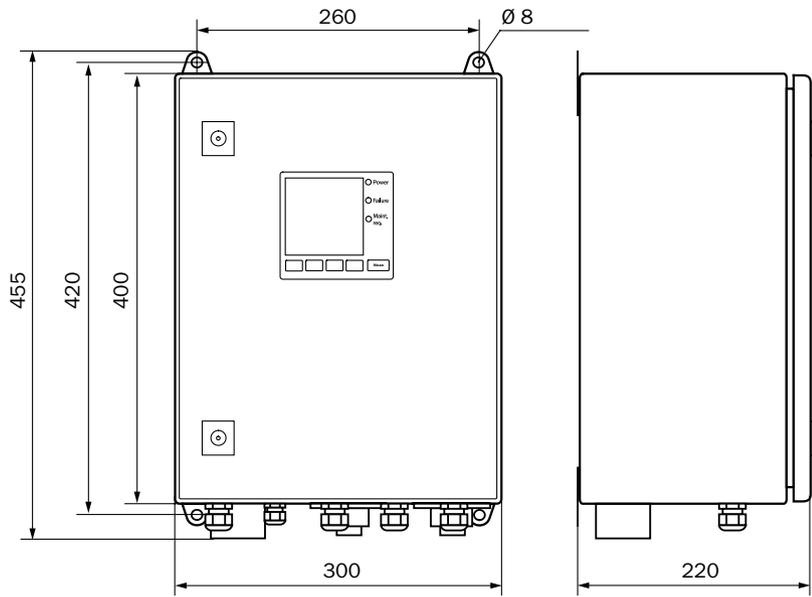
Sender/receiver unit type	L1	Nominal length of the probe L2	L3
DHSP-Txx3	1,347	1,035	900
DHSP-Txx4	1,647	1,335	1,200
DHSP-Txx5	1,947	1,635	1,500
DHSP-Txx6	2,147	1,835	1,700
DHSP-Txx7	2,397	2,085	1,950

All dimensions in mm

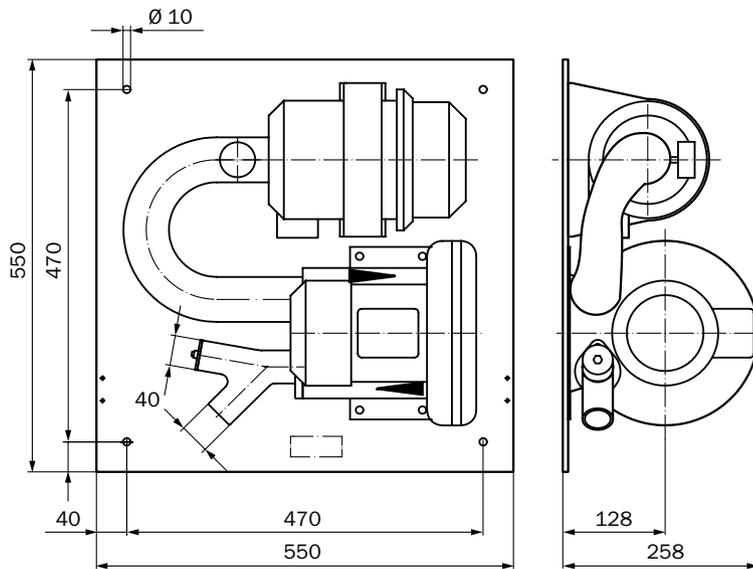
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



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Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2049045

Sets und kits

Brief description	Part no.
DR290 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085134
OMD41 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085136
RM41 replacement set consisting of: 1.0254 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085132
RM41 replacement set consisting of: 1.4571 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085131
RM210 replacement set consisting of: ST37-0 steel adapter flange, adapter plate, seal plate, flange seal, nuts and washers, information document	2089509
Mounting set consisting of: nuts, washers	2018183

Flanges

Weld-in flange

Brief description	Nominal length	Interior diameter	Hole circle diameter	Thread size	Part no.
Adapter flange, for gas temperatures > 150 °C, stainless steel 1.4571	110 mm	70.2 mm	150 mm	M10	2018179
Adapter flange, for gas temperatures > 150 °C, structural steel 1.0037	110 mm	70.2 mm	150 mm	M10	2019369
Flange with tube, 1.4571 stainless steel	240 mm	70.2 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	500 mm	70.2 mm	100 mm	M10	2017850
	130 mm	70.2 mm	100 mm	M10	2017845
	500 mm	70 mm	100 mm	M10	2076714
	1,100 mm	123 mm	150 mm	M12	7047581
	800 mm	125 mm	150 mm	M12	7047580
	500 mm	70.2 mm	127 mm	M10	2017849
	240 mm	70.2 mm	100 mm	M10	2017847
Flange with tube, 1.4571 stainless steel	130 mm	70.2 mm	127 mm	M10	2017846

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood for Dusthunter with nominal length greater than 735 mm, aluminum, painted	7047582
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

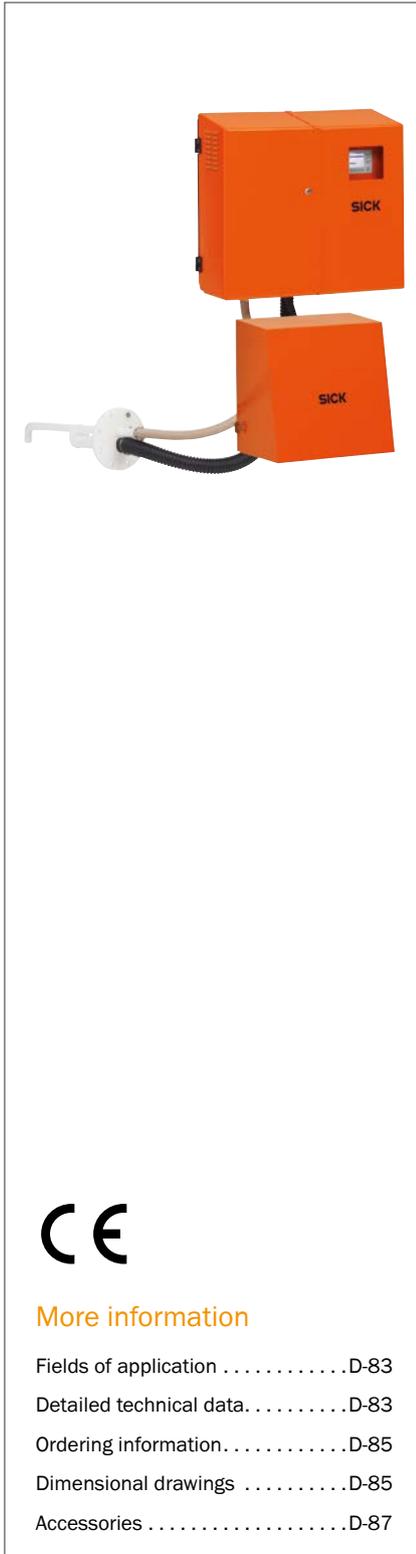
Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977

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RELIABLE DUST MEASUREMENT IN WET GASES



Product description

The FWE200DH dust measuring device is designed to continuously measure dust concentrations in wet flue gas. The gas is extracted via a sampling probe and heated above dew point. Droplets in the gas are vaporized, making it impossible for them to falsify the measurement

results. The highly sensitive scattered light measurement principle enables even very low dust concentrations to be measured.

The FWE200DH meets the requirements of EN 14181 and EN 15267.

At a glance

- For very low to moderate dust concentrations
- Gas sampling and return combined in one probe
- Contamination check
- Automatic check of zero and reference point
- Easy configuration and convenient operation, optionally via an additional remote display
- Integrated system monitoring for early determination of maintenance needs

Your benefits

- Reliable and proven dust measurement in moist gases
- Economic operation due to very few consumable parts and very low amount of installation work required
- Very low-maintenance since no moving parts come into contact with the aggressive gas
- Easy commissioning directly at the measurement site due to automatic measuring range setting
- Very long service life thanks to compact design



More information

Fields of application	D-83
Detailed technical data	D-83
Ordering information	D-85
Dimensional drawings	D-85
Accessories	D-87

→ www.sick.com/FWE200DH

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



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Fields of application

- Monitoring of wet gas scrubbing facilities
- Measurement in saturated gas downstream of desulfurization plants
- Determination of dust concentrations in wet exhaust air and in technological processes

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

FWE200DH system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Dust concentration
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 200 mg/m ³ Measuring ranges freely selectable Higher measuring ranges on request
Setting time (t₉₀)	0.1 s ... 600 s freely adjustable
Accuracy	± 2% of the measuring range limit value
Process temperature	PVDF sensor: ≤ +120 °C Hastelloy sensor: ≤ +220 °C designs for higher temperatures available on request
Process pressure	With SLV7 purge air unit 2BH1100: -20 hPa ... 20 hPa
Process gas velocity	7 m/s ... 30 m/s
Process gas humidity	Max. 10 g/m ³ liquid water without water vapor
Ambient temperature	-20 °C ... +50 °C Suction temperature for the purge air: -20 °C ... +45 °C
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (German Technical Instructions on Air Quality Control) EN 15267 EN 14181 U.S. EPA PS-11 compliant
Electrical safety	CE
Enclosure rating	System: IP 54 Control unit: IP 65
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 500 Ω Electrically isolated
Analog inputs	6 inputs: 0 ... 20 mA, 500 Ω Not electrically isolated
Digital outputs	5 relay outputs (changeover contact), volt-free: 48 V, 1 A
Digital inputs	8 inputs: volt-free

Interfaces and bus protocols	Ethernet	Modbus TCP
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
	RS-232	Proprietary service interface
Display	LC display and status LED on control and remote operation unit	
Input	Function buttons	
Operation	Menu-guided operation via control unit or SOPAS ET software	
Dimensions (W x H x D)	813 mm x 722 mm x 286 mm (FWE200DH measuring and control unit, for details see dimensional drawings)	
Weight	FWE200DH measuring and control unit: 65 kg Sampling probe: ≤ 15 kg	
Power supply	Voltage	115 V / 230 V
	Frequency	50 Hz / 60 Hz
	Power consumption	≤ 1.7 kW without heated measuring gas line
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter	
Options	FWE200DH mounting frame	

SLV7-1 purge air unit, 2BH1100, 1-ph

Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	30 m ³ /h ... 40 m ³ /h	
Ambient temperature	-20 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	16 kg	
Power supply	Voltage	230 V / 115 V
	Frequency	50 Hz / 60 Hz
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclon, dust capacity 200 g	

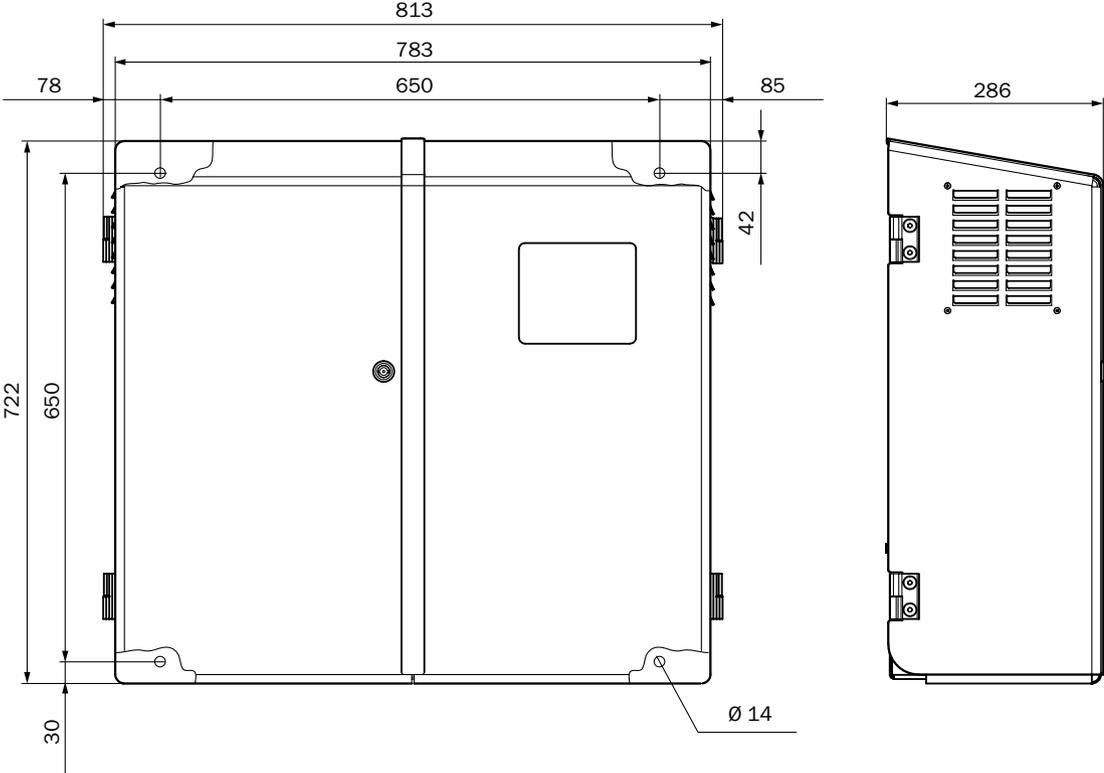
D

Ordering information

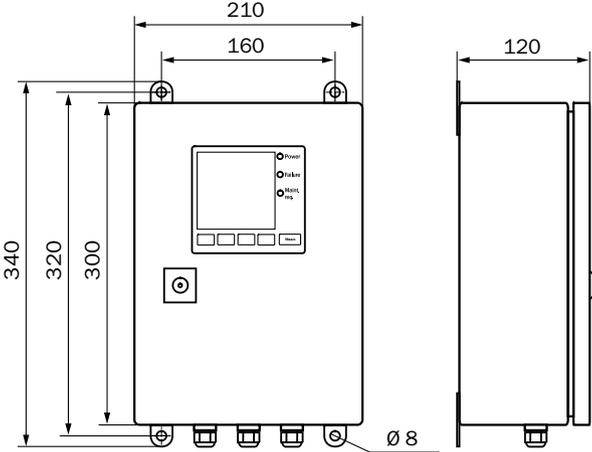
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

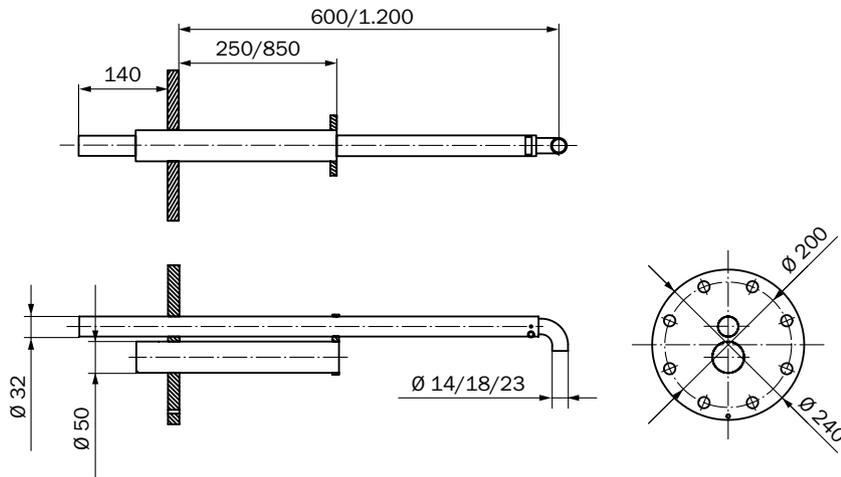
FWE200DH control unit



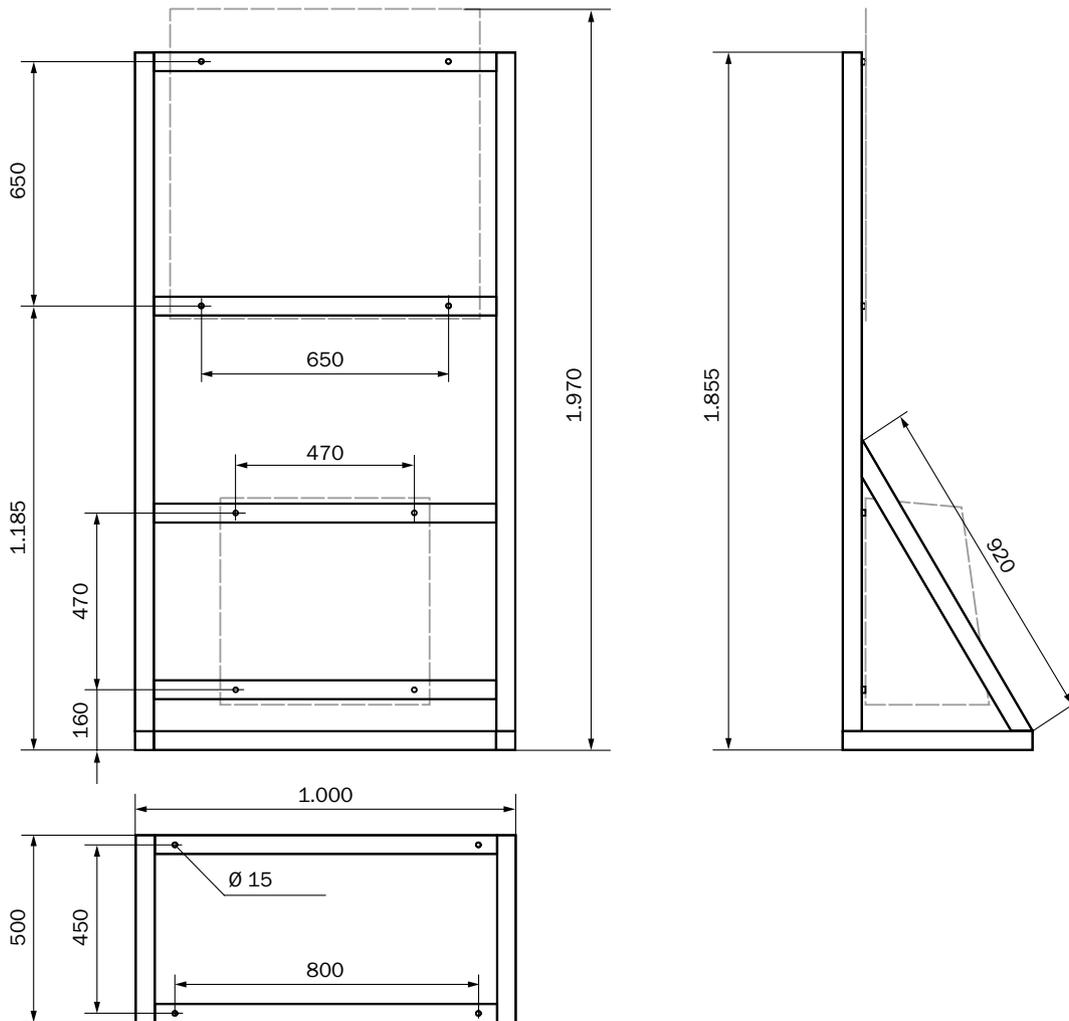
FWE200DH remote control unit



Sampling probe

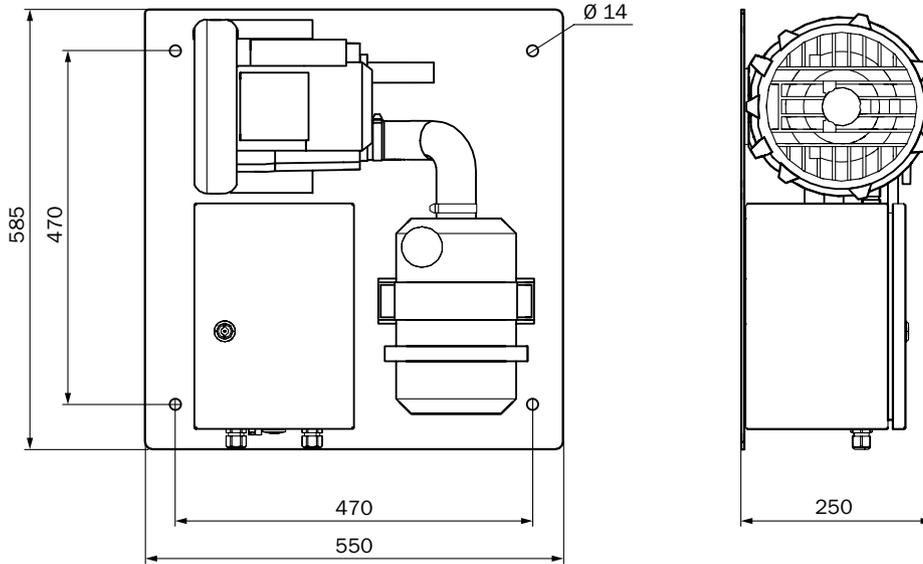


FWE200DH mounting frame



D

SLV7-1 purge air unit, 2BH1100, 1-ph



Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2077639

Flanges

Weld-in flange

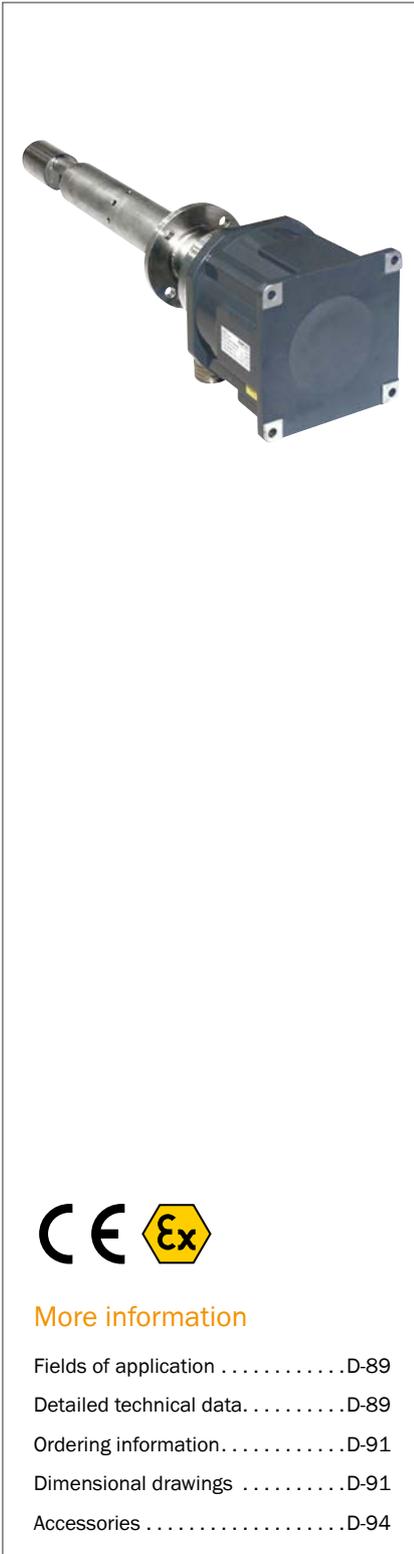
Brief description	Nominal length	Interior diameter	Hole circle diameter	Part no.
Flange with tube, 1.0037 structural steel	200 mm	139 mm	200 mm	7047616
Flange with tube, 1.4571 stainless steel	200 mm	139 mm	200 mm	7047641

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood for external blower unit, aluminum, painted	5306108

EFFECTIVE MONITORING OF DUST CONCENTRATIONS IN EX-ZONE WITH SCATTERED LIGHT



Product description

The FW101 Ex measuring device is used in the constant measurement of dust concentrations in the small to moderate range. It measures independently of gas velocity, humidity, or particle charge. The probe-shaped design of the FW101 Ex provides a particular advantage. It can be installed at one end of the gas

duct and requires neither mechanical adjustment nor adjustment to dust-free measurement sections. As a result, the measuring device is versatile; e.g., for gas channels with small to large diameters and for thin and thick-walled stacks.

At a glance

- Automatic check of zero and reference point
- Contamination check
- Optional evaluation unit for remote operation
- Device versions for Ex-zone 1, 2 and 22

Your benefits

- Installation from only one side
- Easy mounting
- Measurements in explosion-hazardous areas



More information

Fields of applicationD-89
 Detailed technical data.D-89
 Ordering information.D-91
 Dimensional drawingsD-91
 AccessoriesD-94

→ www.sick.com/FW101_Ex

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Clean gas monitoring downstream of filter systems
- Monitoring of cloth filters for defective filter bags
- Dust monitoring in grinding and metering systems
- Protection of flue gas desulfurization plants from excessive dust loads
- Monitoring and control of fresh air and exhaust air units
- Measurements in potentially explosive atmospheres

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

FW101 Ex system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 200 mg/m ³ Measuring ranges freely selectable Higher measuring ranges on request
Setting time (t₉₀)	0.1 s ... 600 s freely adjustable
Accuracy	± 2% of the measuring range limit value
Process temperature	Standard version: -40 °C ... +220 °C High temperature version: -40 °C ... +400 °C
Process pressure	With external purge air unit: -50 hPa ... 30 hPa With instrument air (from customer): -50 hPa ... 100 hPa
Process gas humidity	Non-condensing
Channel diameter	≥ 0.25 m
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter
Options	External purge air unit

FWSE101 Ex sender/receiver unit

Description	Measurement system analyzer unit
Ambient temperature	-20 °C ... +40 °C
Ex approvals	ATEX Version for Ex-zone 1 and 2: II 2G Ex d IIC T6 Version for Ex-zone 22: II 3D Ex t IIIB T80 °C DC IP 54
Enclosure rating	IP 66
Dimensions (W x H x D)	180 mm x 200 mm x 700 mm (nominal length 435 mm, for details, see dimensional drawings) 180 mm x 200 mm x 1,000 mm (nominal length 735 mm, for details, see dimensional drawings)
Weight	Nominal length 435 mm: ≤ 10.6 kg Nominal length 735 mm: ≤ 11.9 kg
Power supply	Voltage 24 V Supply via the connecting unit
Power consumption	≤ 4 W

AK1-Ex connecting unit

Description	Unit for connecting the data lines and energy supply of the system components; for use in explosion-hazardous areas	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	II 2G Ex de IIC T6
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display	
Dimensions (W x H x D)	210 mm x 493 mm x 180 mm (for details, see dimensional drawings)	
Weight	13.3 kg	
Power supply	Voltage	100 ... 240 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W

AK1-Ex22 connecting unit

Description	Unit for connecting the data lines and energy supply of the system components; for use in dust explosion-hazardous areas	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	II 2D Ex tD A21 T80 °C IP6x
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display	
Dimensions (W x H x D)	200 mm x 300 mm x 155 mm (for details, see dimensional drawings)	
Weight	4.9 kg	
Power supply	Voltage	100 ... 240 V
		Optional: 24 V DC ± 2 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W

D

SLV5-2 purge air unit, 2BH1300, ATEX 3/2D

Description	Unit for providing dust-free air for purging optical surfaces; for use in dust explosion-hazardous areas
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter
Ambient temperature	-20 °C ... +40 °C
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)
Weight	18 kg
Power supply	3-phase current 3-phase, Δ: 230 V, 50 Hz, 2.4 A, 550 W 3-phase, Y: 400 V, 50 Hz, 1.4 A, 550 W
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g

SLV5-1 purge air unit, 2BH1300, ATEX 3/2G

Description	Unit for providing dust-free air for purging optical surfaces; for use in explosion-hazardous areas
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter
Ambient temperature	-20 °C ... +40 °C
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)
Weight	18 kg
Power supply	3-phase current 3-phase, Δ: 230 V, 50 Hz, 2.4 A, 550 W 3-phase, Y: 400 V, 50 Hz, 1.4 A, 550 W
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g

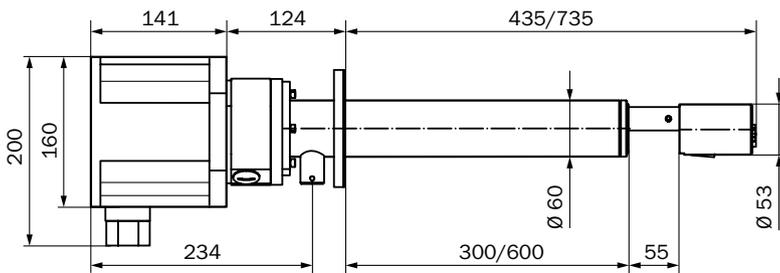


Ordering information

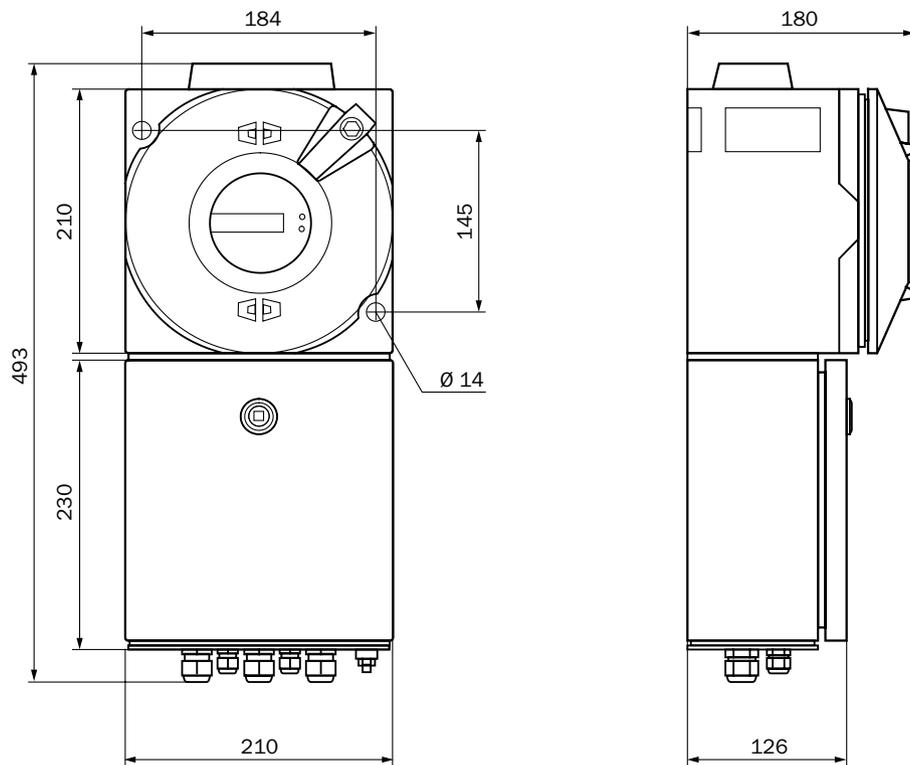
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

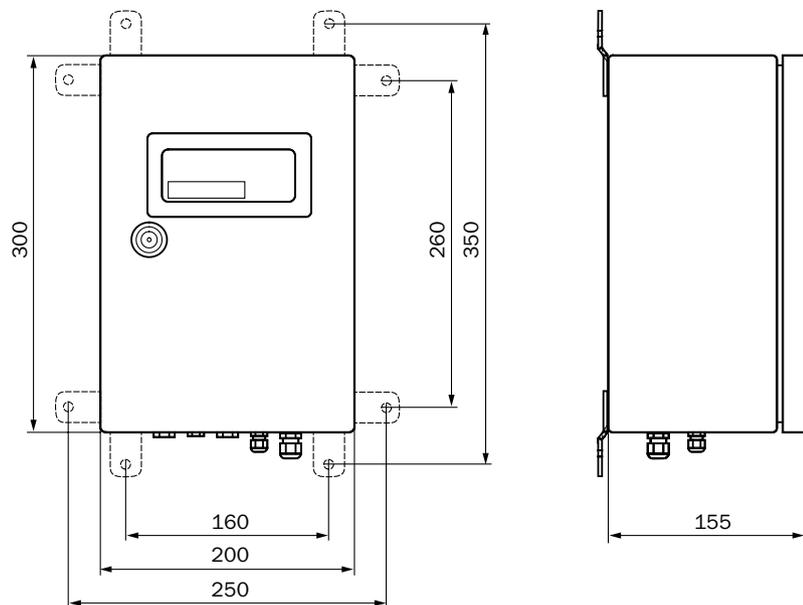
FWSE101 Ex sender/receiver unit



AK1-Ex connecting unit

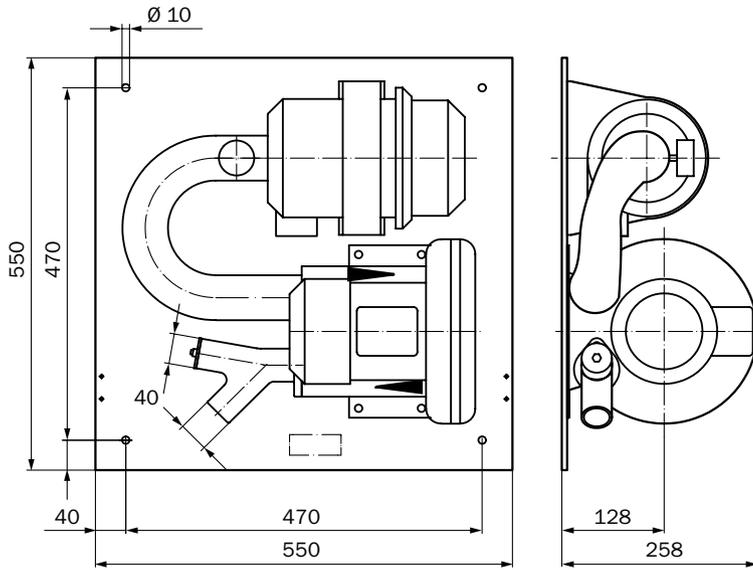


AK1-Ex22 connecting unit



D

SLV5 purge air unit, 2BH1300, Ex



Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2049045

Sets und kits

Brief description	Part no.
Mounting set consisting of: nuts, washers	2018184

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.0037 structural steel	500 mm	127 mm	M10	2017849
		100 mm	M10	2017850
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017847
		100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108
Weather hood for FWSE/FWR-D housing, aluminum, painted	7040394

Plug connectors and cables

Other plug connectors and cables

Brief description	Part no.
RS 232 interface cable, 2 m	7040012



D

EFFECTIVE MONITORING OF DUST CONCENTRATIONS WITH SCATTERED LIGHT



Product description

The FW102 measuring device is used in the constant measurement of dust concentrations in the small to moderate range. It measures independently of gas velocity, humidity, or particle charge. The probe-shaped designed of the FW102

provides a particular advantage. It can be installed at one end of the gas duct and requires neither mechanical adjustment nor adjustment to dust-free measurement sections.

At a glance

- Automatic check of zero and reference point
- Optional evaluation unit for connection and remote maintenance of up to three FW102 measuring devices

Your benefits

- Installation from only one side
- Easy mounting

→ www.sick.com/FW102

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



D

Fields of application

- Clean gas monitoring downstream of filter systems
- Monitoring of cloth filters for defective filter bags
- Dust monitoring in grinding and metering systems
- Protection of flue gas desulfurization plants from excessive dust loads
- Monitoring and control of fresh air and exhaust air units

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

FW102 system

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparison measurement)
Performance-tested measurands	Dust concentration
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 200 mg/m ³ Measuring ranges freely selectable Higher measuring ranges on request
Certified measuring ranges	Dust concentration 0 ... 20 mg/m ³
Setting time (t₉₀)	0.1 s ... 600 s freely adjustable
Accuracy	± 2% of the measuring range limit value
Process temperature	-20 °C ... +220 °C
Process pressure	With connecting unit with integrated purge air supply: -50 hPa ... 10 hPa With external purge air unit: -50 hPa ... 70 hPa With instrument air (from customer): -50 hPa ... 100 hPa
Process gas humidity	Non-condensing
Channel diameter	≥ 0.15 m
Conformities	TA-Luft (German Technical Instructions on Air Quality Control) 27.BImSchV EN 14181
Electrical safety	CE
Test functions	Automatic control cycle for zero and span point
Options	External purge air unit

FWSE102 sender and receiver unit

Description	Analyzer unit with measurement probe
Ambient temperature	-20 °C ... +50 °C
Enclosure rating	IP 65
Dimensions (W x H x D)	150 mm x 150 mm x 440 mm
Weight	2.7 kg
Power supply	Voltage 24 V Supply via the connecting unit
	Power consumption ≤ 4 W

AK1-N connecting unit

Description	Unit for connecting the data lines and energy supply of the system components	
Ambient temperature	-20 °C ... +45 °C	
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display, option	
Dimensions (W x H x D)	200 mm x 220 mm x 130 mm (for details, see dimensional drawings)	
Weight	3.7 kg	
Power supply	Voltage	100 ... 240 V Optional: 24 V DC ± 2 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W

AK1-P connecting unit

Description	Unit for connecting the data lines and energy supply of the system components; with integrated purge air supply	
Ambient temperature	-20 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display, option	
Dimensions (W x H x D)	300 mm x 420 mm x 220 mm (for details, see dimensional drawings)	
Weight	13.5 kg	
Power supply	Voltage	100 ... 240 V Optional: 24 V DC ± 2 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 70 W

D

SLV4-2 purge air unit, 2BH1300, 3-ph

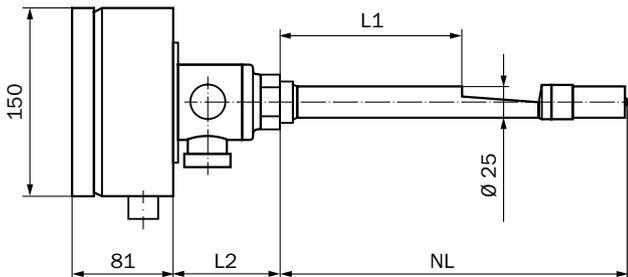
Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g	

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

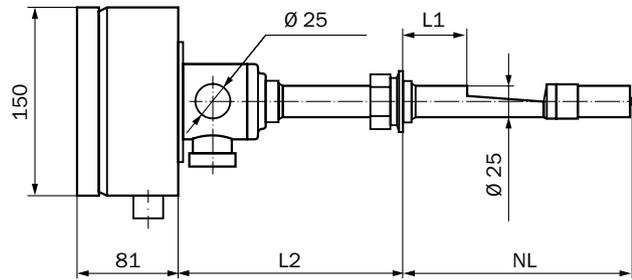
FW102 with 1" thread



Nominal length	L1	L2
180	50	179
280	150	79
All dimensions in mm		

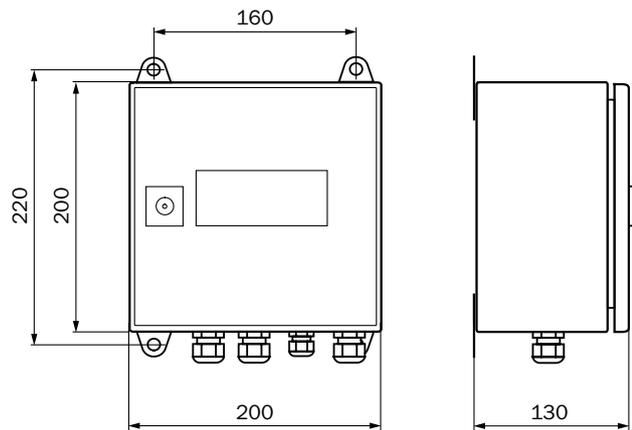
D

FW102 with tri-clamp connection



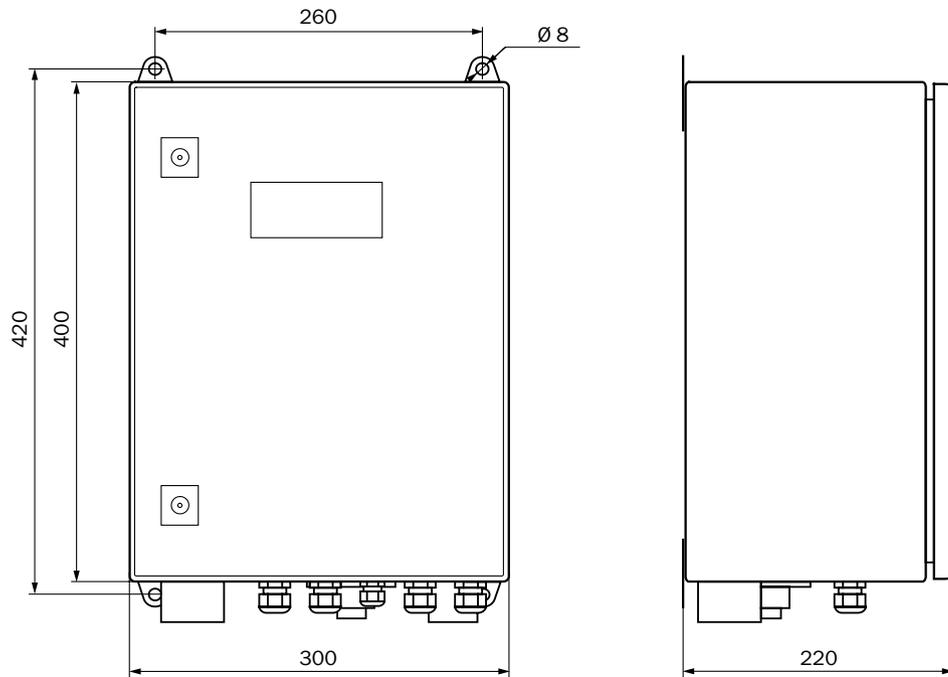
Nominal length	L1	L2
180	50	179
280	150	79
All dimensions in mm		

AK1-N connecting unit

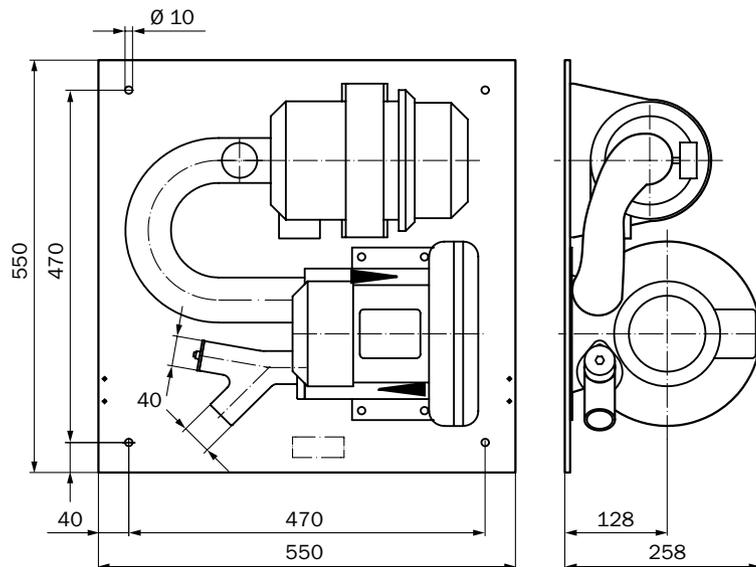


D

AK1-P connecting unit



SLV4-2 purge air unit, 2BH1300



D

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2049045

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	240 mm	100 mm	M10	2017847
	500 mm	100 mm	M10	2017850
		127 mm	M10	2017849

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108
Weather hood for FWSE/FWR-D housing, aluminum, painted	7040394

Plug connectors and cables

Other plug connectors and cables

Brief description	Part no.
RS 232 interface cable, 2 m	7040012



D



TRANSMITTANCE DUST MEASURING DEVICES

Maintaining a clear sightline even when dust concentrations are high

Transmittance dust measuring devices transmit light through the entire duct. With this type of measurement, light attenuation indicates the concentration of dust inside the duct. These measuring devices are specially designed for medium to high dust concentrations

and large duct diameters. Consequently, they are equally suited to emission and process monitoring as they are to hall monitoring applications.

Your benefits

- Safe and reliable detection of dust concentrations, even if high

- Long maintenance intervals thanks to automatic self-monitoring
- Status-dependent maintenance message
- User-friendly operation

E



	Product family overview	E-106
	DUSTHUNTER C200 Two-in-one – dust measuring device with transmittance and scattered light measurement	E-108
	DUSTHUNTER T200. The type approved transmissiometer with self-alignment function	E-120
	DUSTHUNTER T100. The type approved transmissiometer for emission monitoring	E-130
	DUSTHUNTER T50 The transmissiometer for monitoring dust concentration	E-140
	FW300 Ex The reliable dust measuring device for explosion-hazardous areas	E-148



PRODUCT FAMILY OVERVIEW

	 <p>DUSTHUNTER C200</p>	 <p>DUSTHUNTER T200</p>	
	Two-in-one – dust measuring device with transmittance and scattered light measurement	The type approved transmissiometer with self-alignment function	

Technical data overview			
Measurands	Transmission, opacity, relative opacity, extinction, dust concentration (transmission), dust concentration (scattered light), scattered light intensity	Transmission, opacity, relative opacity, extinction, dust concentration	
Performance-tested measurands	Extinction, scattered light intensity	Extinction	
Measurement principles	Transmittance measurement, scattered light forward	Transmittance measurement	
Process temperature	-40 °C ... +300 °C	-40 °C ... +600 °C	
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa	
Channel diameter	With DHC-R0 reflector/scattered light receiver: 0.5 m ... 3 m With DHC-R1 reflector/scattered light receiver: 2.5 m ... 8 m	0.5 m ... 2.5 m 2 m ... 5 m 4 m ... 12 m 10 m ... 50 m	
Conformities	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU, U.S. EPA PS-11 compliant, U.S. EPA PS-1 compliant	For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU, U.S. EPA PS-1 compliant	
Enclosure rating	IP 66	IP 66	
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter	

At a glance		
	<ul style="list-style-type: none"> • Combination of transmission and scattered light measurement • For very low to high dust concentrations • Automatic check of zero and reference point • Double-sided contamination check and correction • Automatic self-alignment • For medium to large duct diameters 	<ul style="list-style-type: none"> • Integrated soiling control for sender-receiver and reflector unit • Automatic self-alignment of the optical modules • Automatic check of zero and reference point • For medium to high dust concentrations • For small to large measuring sections
Detailed information	→ E-108	→ E-120





DUSTHUNTER T100

The type approved transmissiometer for emission monitoring



DUSTHUNTER T50

The transmissiometer for monitoring dust concentration



FW300 Ex

The reliable dust measuring device for explosion-hazardous areas

Transmission, opacity, relative opacity, extinction, dust concentration

Extinction

Transmittance measurement

-40 °C ... +600 °C

With MCU-P control unit: -50 hPa ... 2 hPa

With external purge air unit:

-50 hPa ... 30 hPa

0.5 m ... 2.5 m

2 m ... 5 m

4 m ... 12 m

For systems requiring permission, 2001/80/EC (13. BImSchV (German Federal Emission Protection Directive)), 2000/76/EC (17. BImSchV), 27.BImSchV, TA-Luft (German Technical Instructions on Air Quality Control), EN 15267, EN 14181, MCERTS, 2010/75/EU

IP 66

Automatic self-test (linearity, contamination, drift, aging)

Contamination limit values: Warning at 20%; fault at 30%

Manual linearity test using reference filter

Transmission, opacity, relative opacity, extinction, dust concentration

-

Transmittance measurement

-40 °C ... +600 °C

With MCU-P control unit: 50 hPa ... 2 hPa

With external purge air unit:

-50 hPa ... 30 hPa

0.5 m ... 2.5 m

2 m ... 5 m

4 m ... 8 m

-

IP 66

Automatic self-test (linearity, drift, aging)
Manual linearity test using reference filter

Transmission, opacity, extinction, dust concentration

-

Transmittance measurement

0 °C ... +600 °C

-50 hPa ... 30 hPa

0.5 m ... 2 m

1.5 m ... 8 m

-

IP 65

Automatic self-test (linearity, drift, aging)
Manual linearity test using reference filter

- For medium to high dust concentrations
- Built-in contamination monitoring
- Automatic check of zero and reference point
- For small to large measuring sections

→ E-130

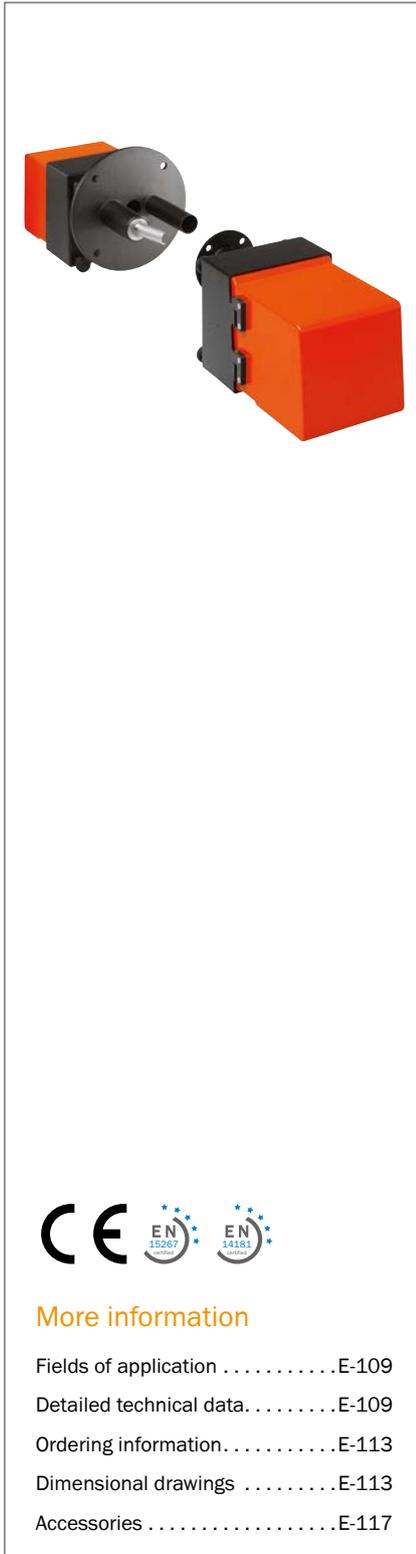
- For medium to high dust concentrations
- Automatic check of zero and reference point
- For small to medium measurement sections

→ E-140

- For medium to high dust concentrations
- Automatic check of zero and reference point
- Device versions for Ex-zone 1, 2 and 22
- For small to medium measurement sections

→ E-148

TWO-IN-ONE – DUST MEASURING DEVICE WITH TRANSMITTANCE AND SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER C200 is a type-approved measuring device which combines the advantages of the transmittance and forward scattered light measurement principles. It is therefore ideal for the detection of very low to high

concentrations of dust. The automatic self-alignment optimizes the position of the measurement beam and prevents false measurements. Automatic testing of zero point and reference point is built in to the device, as is a soiling check.

At a glance

- Combination of transmission and scattered light measurement
- For very low to high dust concentrations
- Automatic check of zero and reference point
- Double-sided contamination check and correction
- Automatic self-alignment
- For medium to large duct diameters

Your benefits

- Suitable for sharply fluctuating dust concentrations
- Redundant measurement for reliable application
- Low-maintenance thanks to self-monitoring
- Equipped for limit values that will become smaller in the future
- Tested for suitability according to EN 15267



More information

Fields of application E-109
 Detailed technical data E-109
 Ordering information E-113
 Dimensional drawings E-113
 Accessories E-117

→ www.sick.com/DUSTHUNTER_C200

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



E

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Measurement of the dust concentration in exhaust gas and exhaust air systems upstream and downstream of the filter

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER C200 system

Measurands	Transmission, opacity, relative opacity, extinction, dust concentration (scattered light), dust concentration (transmission), scattered light intensity												
Performance-tested measurands	Scattered light intensity, extinction												
Measurement principles	Transmittance measurement, scattered light forward												
Spectral range	Transmittance measurement: 450 nm ... 700 nm Scattered light forward: 640 nm ... 660 nm laser, protection class 2, power < 1 mW												
Measuring ranges	<table border="0"> <tr> <td>Transmission</td> <td>100 ... 90% / 100 ... 0%</td> </tr> <tr> <td>Opacity</td> <td>0 ... 10% / 0 ... 100%</td> </tr> <tr> <td>Relative opacity</td> <td>0 ... 10% / 0 ... 100%</td> </tr> <tr> <td>Extinction</td> <td>0 ... 0.045 / 0 ... 2</td> </tr> <tr> <td>Dust concentration (scattered light)</td> <td>0 ... 5 mg/m³ / 0 ... 200 mg/m³</td> </tr> <tr> <td>Dust concentration (transmission)</td> <td>0 ... 200 mg/m³ / 0 ... 10,000 mg/m³</td> </tr> </table> <p>The transmittance measurement depends on measuring section and particle properties</p>	Transmission	100 ... 90% / 100 ... 0%	Opacity	0 ... 10% / 0 ... 100%	Relative opacity	0 ... 10% / 0 ... 100%	Extinction	0 ... 0.045 / 0 ... 2	Dust concentration (scattered light)	0 ... 5 mg/m ³ / 0 ... 200 mg/m ³	Dust concentration (transmission)	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³
Transmission	100 ... 90% / 100 ... 0%												
Opacity	0 ... 10% / 0 ... 100%												
Relative opacity	0 ... 10% / 0 ... 100%												
Extinction	0 ... 0.045 / 0 ... 2												
Dust concentration (scattered light)	0 ... 5 mg/m ³ / 0 ... 200 mg/m ³												
Dust concentration (transmission)	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³												
Certified measuring ranges	<table border="0"> <tr> <td>Dust concentration (scattered light)</td> <td>0 ... 50 SI / 0 ... 5 SI / 0 ... 20 SI / 0 ... 100 SI / 0 ... 200 SI</td> </tr> <tr> <td>Dust concentration (transmission)</td> <td>0 ... 0.1 Ext / 0 ... 0.05 Ext / 0 ... 0.2 Ext / 0 ... 0.5 Ext / 0 ... 1 Ext</td> </tr> </table>	Dust concentration (scattered light)	0 ... 50 SI / 0 ... 5 SI / 0 ... 20 SI / 0 ... 100 SI / 0 ... 200 SI	Dust concentration (transmission)	0 ... 0.1 Ext / 0 ... 0.05 Ext / 0 ... 0.2 Ext / 0 ... 0.5 Ext / 0 ... 1 Ext								
Dust concentration (scattered light)	0 ... 50 SI / 0 ... 5 SI / 0 ... 20 SI / 0 ... 100 SI / 0 ... 200 SI												
Dust concentration (transmission)	0 ... 0.1 Ext / 0 ... 0.05 Ext / 0 ... 0.2 Ext / 0 ... 0.5 Ext / 0 ... 1 Ext												
Setting time (t₉₀)	1 s ... 600 s adjustable												
Accuracy	≤ ± 2 %												
Process temperature	-40 °C ... +300 °C												
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa												
Process gas humidity	Non-condensing												
Channel diameter	With DHC-R0 reflector/scattered light receiver: 0.5 m ... 3 m With DHC-R1 reflector/scattered light receiver: 2.5 m ... 8 m												
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-11 compliant U.S. EPA PS-1 compliant												
Electrical safety	CE												

Corrective functions	Automatic self-alignment
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter

DHC-T sender/receiver unit

Description	Cross-duct measurement system analyzer unit
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 429 mm (for details, see dimensional drawings)
Weight	≤ 9.5 kg
Power supply	
Voltage	24 V
	Supply via control unit
Power consumption	≤ 17 W
Auxiliary gas connections	Purge air

DHC-R0 reflector/scattered light receiver

Description	Combination of reflector unit for transmittance measurement and receiver for scattered light measurement
Measuring path length	≤ 0,1 m effective measuring section for scattered light measurement
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 420 mm (for details, see dimensional drawings)
Weight	≤ 8 kg
Auxiliary gas connections	Purge air

DHC-R1 reflector/scattered light receiver

Description	Combination of reflector unit for transmittance measurement and receiver for scattered light measurement
Measuring path length	≤ 0,3 m effective measuring section for scattered light measurement
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	265 mm x 308 mm x 549 mm (for details, see dimensional drawings)
Weight	≤ 12 kg
Auxiliary gas connections	Purge air

MCU-N control unit



Description	Unit for controlling the system components and evaluating and outputting the data provided by them
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)

Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit.	
Gas flow rate	≤ 20 m ³ /h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"	

Operation	Via LC display or SOPAS ET software
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm
Weight	≤ 13.5 kg
Power supply	
Voltage	90 ... 250 V Version with 24 V DC available as an option
Frequency	47 to 63 Hz
Power consumption	≤ 70 W
Auxiliary gas connections	Purge air
Options	Interface module(s) I/O module(s)

SLV4-2 purge air unit, 2BH1300, 3-ph

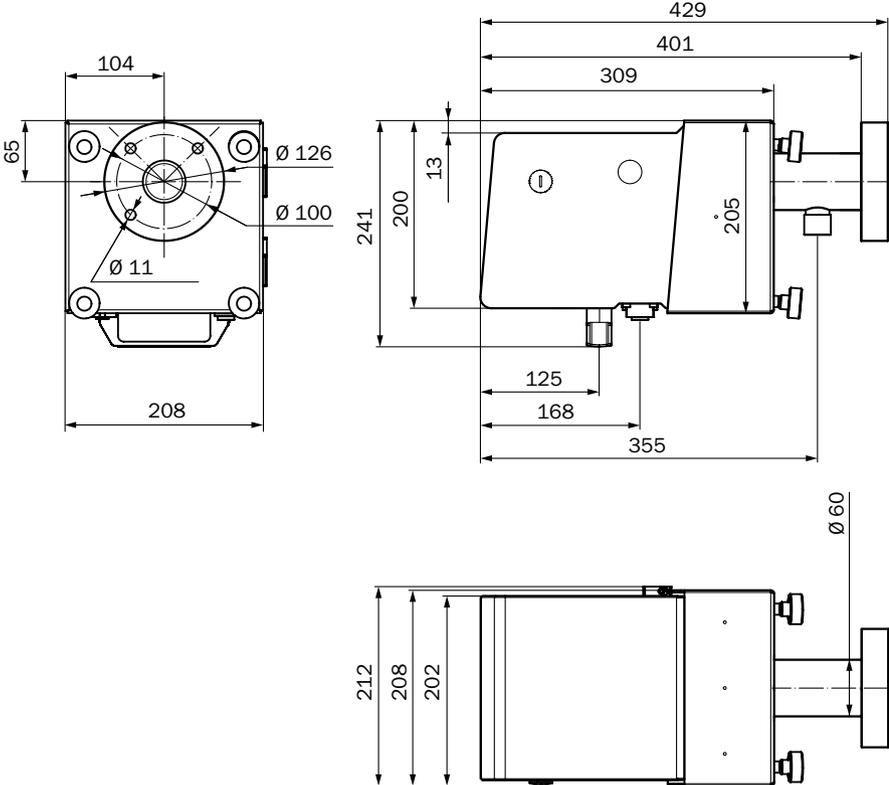
Description	Unit for providing dust-free air for purging optical surfaces
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter
Ambient temperature	-20 °C ... +40 °C
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)
Weight	18 kg
Power supply	
3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-level air filter, type Europiclön, dust capacity 200 g

Ordering information

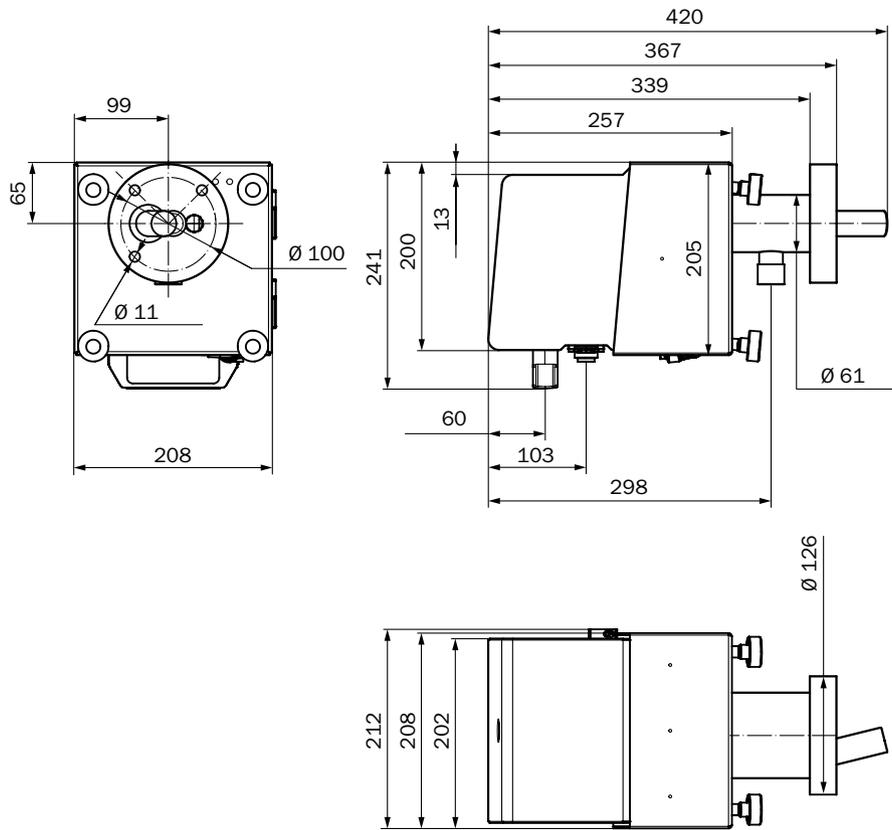
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

DHC-T sender/receiver unit

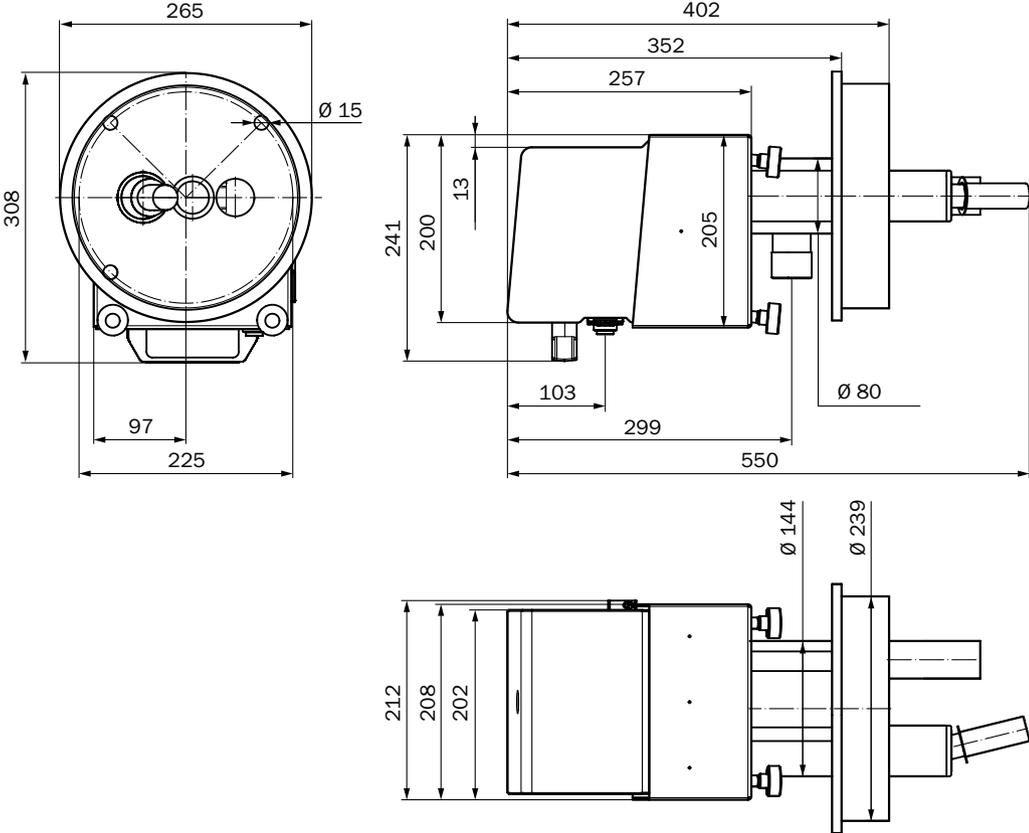


DHC-R0 reflector/scattered light receiver

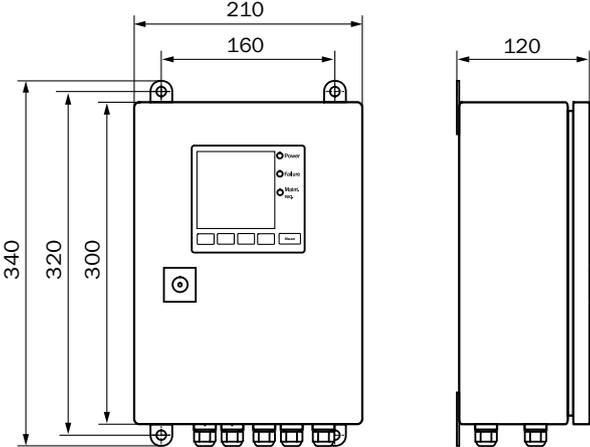


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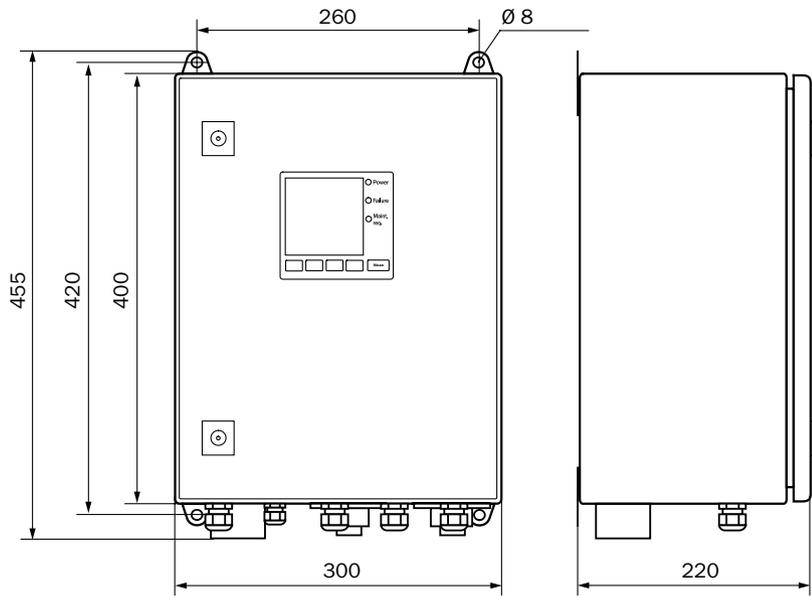
DHC-R1 reflector/scattered light receiver



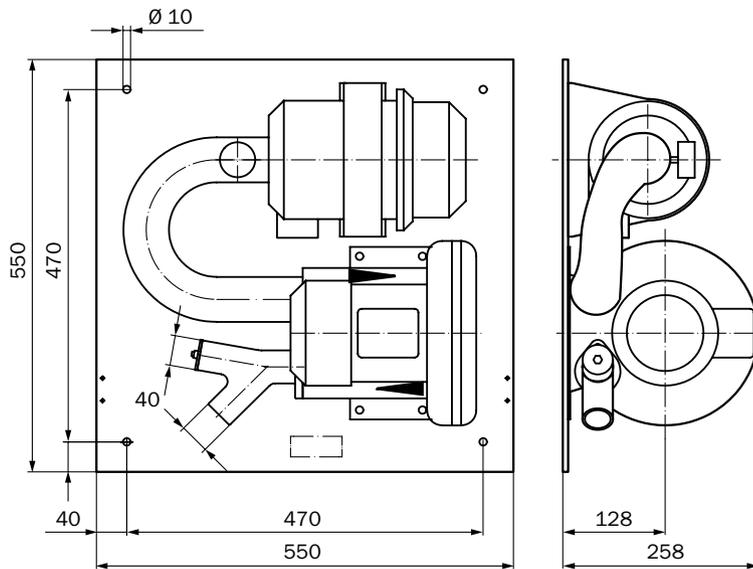
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



E

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 20%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2050600
Control filter set consists of: filter with approx. 0%, 18%, 40%, 60%, 80% transmission and 0%, 50% opacity as per EPA, filter holder, lens cloth, connection cable, case with insert	2050050

Sets und kits

Brief description	Part no.
Mounting set consisting of: spring plates, spherical washers, nuts	2060477
Mounting set consisting of: nuts, washers, spherical washers	2018183

Flanges

Weld-in flange

Brief description	Nominal length	Interior diameter	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.4571 stainless steel	240 mm	70.2 mm	100 mm	M10	2017848
	110 mm	70.2 mm	100 mm	M10	2054536
Flange with tube, 1.0037 structural steel	110 mm	70.2 mm	100 mm	M10	2054535
Flange with tube, 1.4571 stainless steel	130 mm	70.2 mm	127 mm	M10	2017846
Flange with tube, 1.0037 structural steel	130 mm	70.2 mm	100 mm	M10	2017845
Flange with tube, including mounting kit, 1.0037 structural steel	350 mm	152 mm	225 mm	M12	2045418
Flange with tube, 1.0037 structural steel	240 mm	70.2 mm	100 mm	M10	2017847
			100 mm	M10	2017850
	500 mm	70.2 mm	127 mm	M10	2017849
Flange with tube, including mounting kit, 1.4571 stainless steel	350 mm	152 mm	225 mm	M12	2045420

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
	2048657
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Adjustment block, two adjustment blocks are needed for alignment	2042907
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

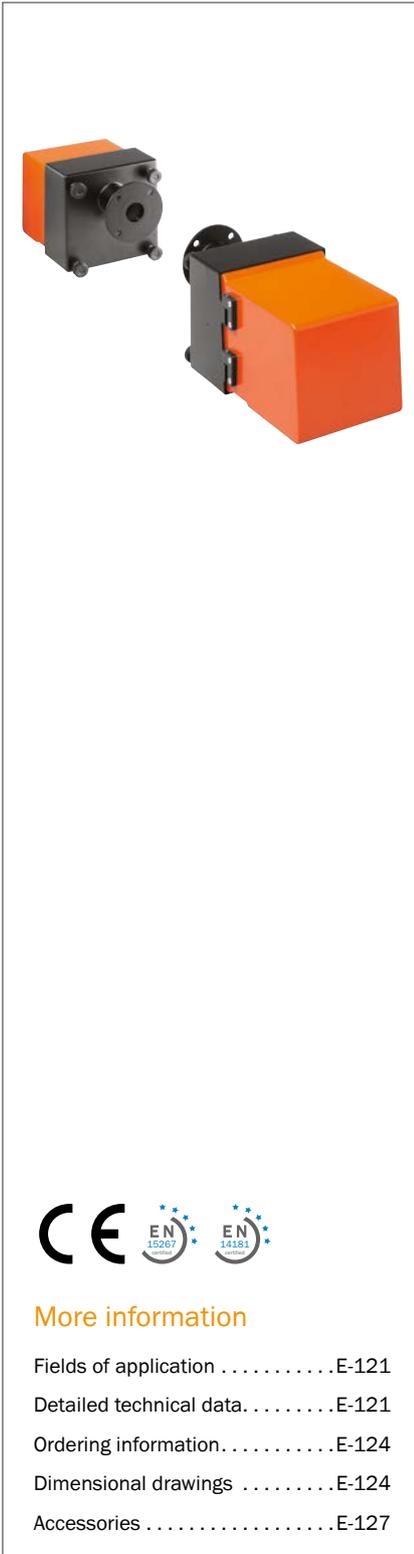
Connection cables with female and male connector

Brief description	Part no.
Connection cable of sender/receiver unit – reflector, 4-wire, 10 m	2045417
Connection cable of sender/receiver unit – reflector, 4-wire, 20 m	2048674
Connection cable of sender/receiver unit – reflector, 4-wire, 5 m	2045416



E

THE TYPE APPROVED TRANSMISSIOMETER WITH SELF-ALIGNMENT FUNCTION



Product description

The DUSTHUNTER T200 is a measuring device designed to detect moderate to high dust concentrations. The basic measurand is transmission. Opacity and extinction can be calculated and output, as can the dust concentration after gravimetric comparison measurement. It

also features integrated contamination monitoring for the sender/receiver and reflector units as well as automatic self-alignment of the optical assemblies. The DUSTHUNTER T200 has been suitability tested in accordance with EN 15267.

At a glance

- Integrated soiling control for sender-receiver and reflector unit
- Automatic self-alignment of the optical modules
- Automatic check of zero and reference point
- For medium to high dust concentrations
- For small to large measuring sections

Your benefits

- Easy installation, commissioning, and operation
- Measurement not dependent on gas velocity, humidity, or particle load
- Low-maintenance thanks to self-monitoring and contamination monitoring
- Tested for suitability according to EN 15267



More information

Fields of application E-121
 Detailed technical data E-121
 Ordering information E-124
 Dimensional drawings E-124
 Accessories E-127

→ www.sick.com/DUSTHUNTER_T200

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



E

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Monitoring of dust load in factory halls
- Control of fresh air and exhaust air units

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER T200 system

Measurands	Transmission, opacity, relative opacity, extinction, dust concentration										
Performance-tested measurands	Extinction										
Measurement principles	Transmittance measurement										
Spectral range	450 nm ... 700 nm										
Measuring path length	0.5 m ... 2.5 m 2 m ... 5 m 4 m ... 12 m 10 m ... 50 m										
Measuring ranges	<table> <tr> <td>Transmission</td> <td>100 ... 90% / 100 ... 0%</td> </tr> <tr> <td>Opacity</td> <td>0 ... 10% / 0 ... 100%</td> </tr> <tr> <td>Relative opacity</td> <td>0 ... 10% / 0 ... 100%</td> </tr> <tr> <td>Extinction</td> <td>0 ... 0.045 / 0 ... 2</td> </tr> <tr> <td>Dust concentration</td> <td>0 ... 200 mg/m³ / 0 ... 10,000 mg/m³</td> </tr> </table> <p>The measurement depends on measuring section and particle properties</p>	Transmission	100 ... 90% / 100 ... 0%	Opacity	0 ... 10% / 0 ... 100%	Relative opacity	0 ... 10% / 0 ... 100%	Extinction	0 ... 0.045 / 0 ... 2	Dust concentration	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³
Transmission	100 ... 90% / 100 ... 0%										
Opacity	0 ... 10% / 0 ... 100%										
Relative opacity	0 ... 10% / 0 ... 100%										
Extinction	0 ... 0.045 / 0 ... 2										
Dust concentration	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³										
Certified measuring ranges											
Dust concentration (transmission)	0 ... 0.1 Ext / 0 ... 0.05 Ext / 0 ... 0.2 Ext / 0 ... 0.5 Ext / 0 ... 1 Ext										
Setting time (t₉₀)	1 s ... 600 s freely adjustable										
Accuracy	± 2 %										
Process temperature	-40 °C ... +600 °C										
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa										
Process gas humidity	Non-condensing										
Channel diameter	0.5 m ... 2.5 m 2 m ... 5 m 4 m ... 12 m 10 m ... 50 m										
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-1 compliant										
Electrical safety	CE										
Corrective functions	Automatic self-alignment										

Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test using reference filter
Options	External purge air unit

DHT-T21 sender/receiver unit

Description	Cross-duct measurement system analyzer unit
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 429 mm (for details, see dimensional drawings)
Weight	≤ 10 kg
Power supply	
Voltage	24 V
	Supply via control unit
Power consumption	≤ 15 W

DHT-R1x reflector unit

Description	Reflector unit with triple reflector
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 364 mm (for details, see dimensional drawings)
Weight	DHT-R10, DHT-R11, DHT-R12, DHT-R13: ≤ 5 kg

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals
Digital inputs	4 volt-free contacts
Interfaces and bus protocols	
Ethernet	Modbus TCP (via optional interface module)
Ethernet	OPC (via optional interface module)
Ethernet	SOPAS ET (via optional interface module)
RS-485	Modbus RTU (via optional interface module)
RS-485	PROFIBUS DP (via optional interface module)
RS-485	SOPAS ET (via optional interface module)
USB	SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"
Operation	Via LC display or SOPAS ET software
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm
Weight	≤ 3.7 kg



Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options		Interface module(s) I/O module(s)

MCU-P control unit

Description		Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit.
Gas flow rate		≤ 20 m ³ /h
Ambient temperature		-40 °C ... +45 °C Suction temperature for the purge air
Enclosure rating		IP 66
Analog outputs		3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs		2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)
Digital outputs		5 relay contacts: 48 V, 1 A Volt-free; for status signals
Digital inputs		4 volt-free contacts
Interfaces and bus protocols		
	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display		LC display Status LEDs: "Power", "Maintenance", and "Fault"
Operation		Via LC display or SOPAS ET software
Dimensions (W x H x D)		300 mm x 455 mm x 220 mm
Weight		≤ 13.5 kg
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 70 W
Auxiliary gas connections		Purge air
Options		Interface module(s) I/O module(s)

SLV4-2 purge air unit, 2BH1300, 3-ph

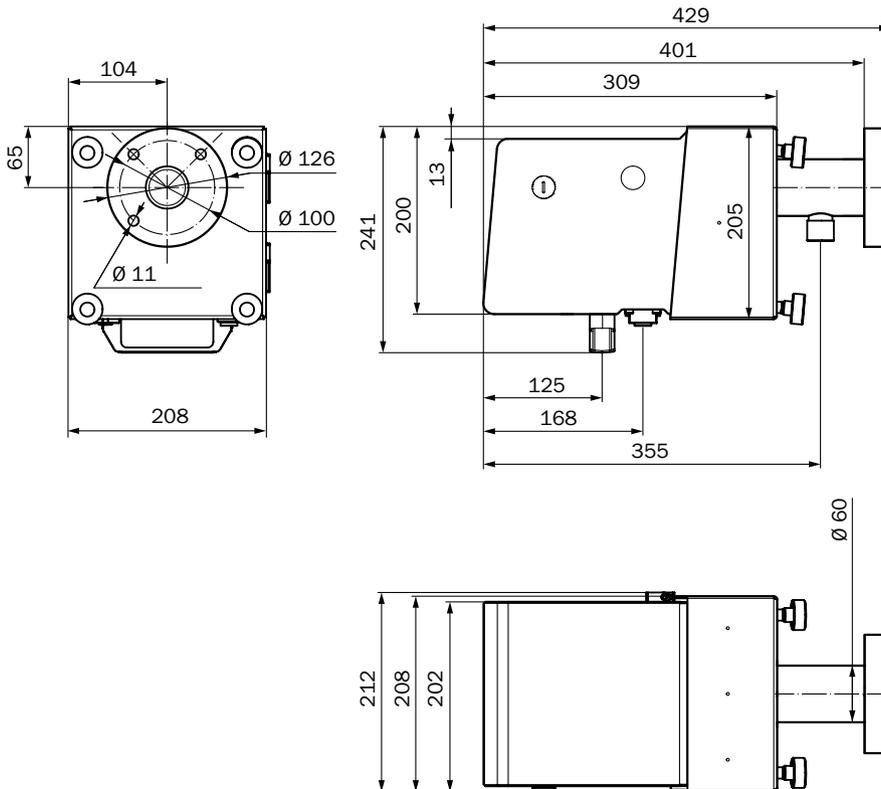
Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g	

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

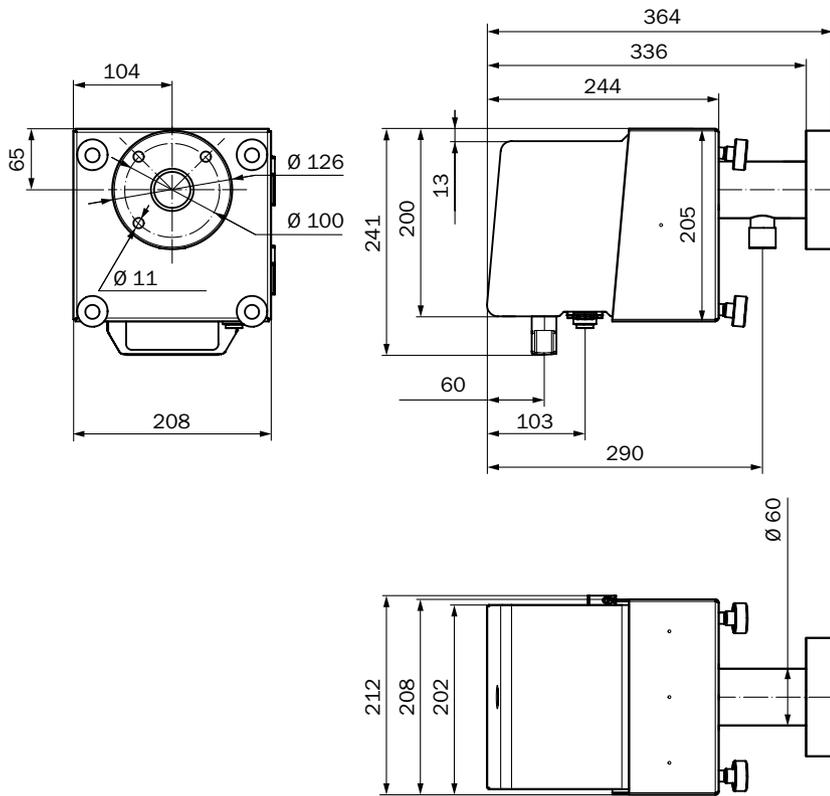
Dimensional drawings (dimensions in mm)

DHT-T21 sender/receiver unit

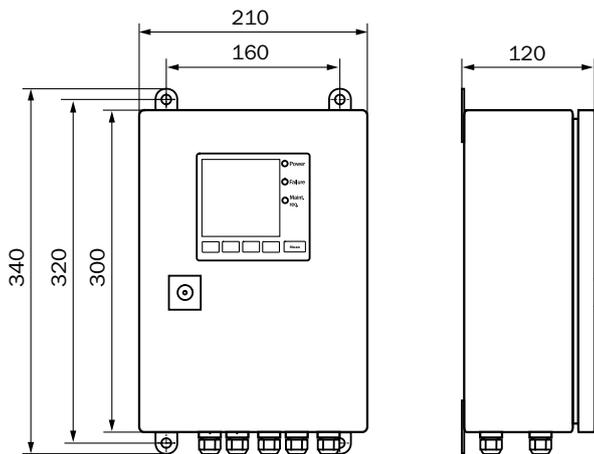


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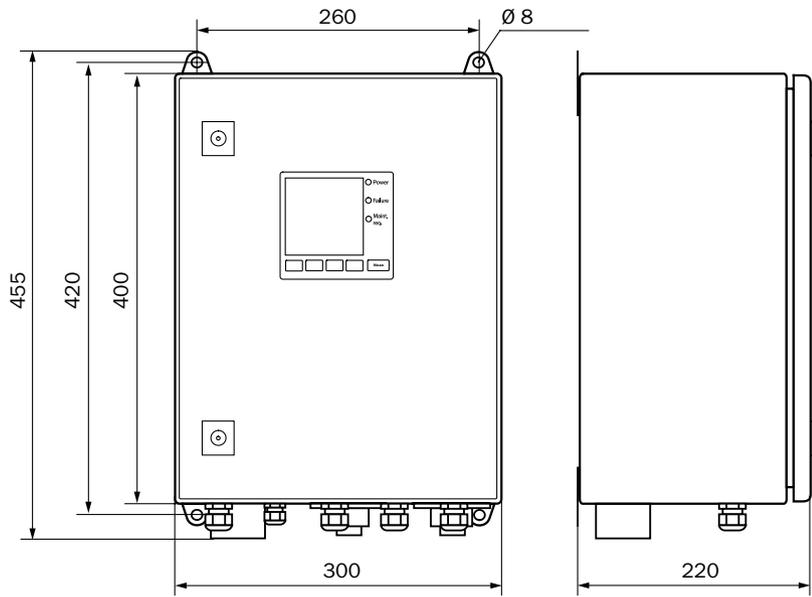
DHT-R1x reflector unit



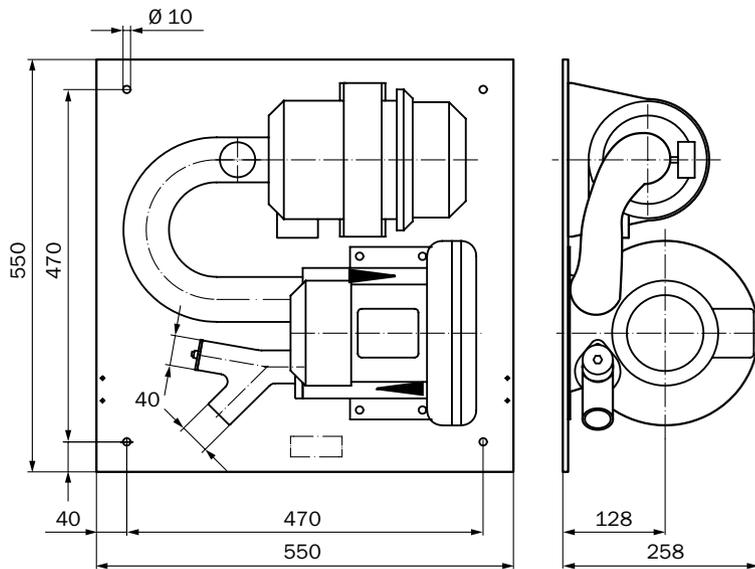
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



E

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 20%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2048676
Control filter set comprises: filter with approx. 0%, 50% opacity as per EPA, filter holder, lens cloth, connection cable, case with insert	2059426

Sets und kits

Brief description	Part no.
DR290 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085135
OMD41/RM61 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085137
RM41 replacement set consisting of: 1.0254 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084068
RM41 replacement set consisting of: 1.4571 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084067
Mounting set consisting of: spring plates, spherical washers, nuts	2060477
Mounting set consisting of: nuts, washers, spherical washers	2018183

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Adapter flange, for gas temperatures > 150 °C, stainless steel 1.4571	110 mm	150 mm	M10	2018179
Adapter flange, for gas temperatures > 150 °C, structural steel 1.0037	110 mm	150 mm	M10	2019369
Flange with tube, 1.0037 structural steel	500 mm	100 mm	M10	2017850
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846
Flange with tube suitable for quick-close device, 1.0037 structural steel	130 mm	127 mm	M10	2017839
Flange with tube suitable for quick-close device, 1.4571 stainless steel	240 mm	127 mm	M10	2017841
Flange with tube suitable for quick-close device, 1.0037 structural steel	500 mm	127 mm	M10	2017842
	240 mm	127 mm	M10	2017840



Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for analyzer extended for quick-close flap, aluminum, painted	2065677
Weather hood for external blower unit, aluminum, painted	5306108

Protective flaps

Brief description	Part no.
Automated quick-closing flap, 2 pieces are required to protect the sender/receiver unit and reflector	6049194

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Adjustment block, two adjustment blocks are needed for alignment	2042907
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

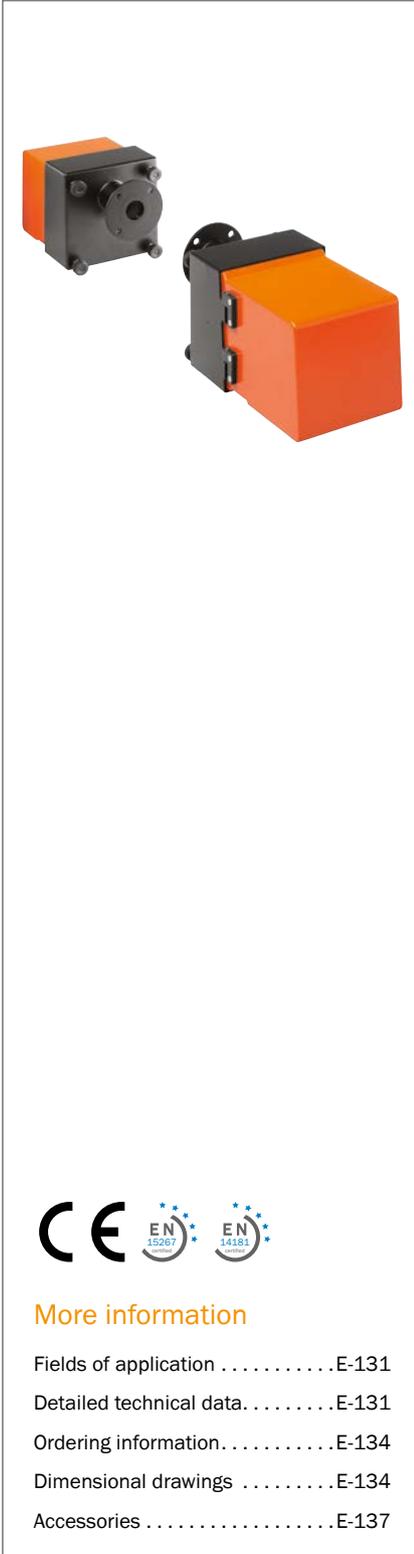
Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977

Connection cables with female and male connector

Brief description	Part no.
Connection cable of sender/receiver unit – reflector, 4-wire, 10 m	2045417
Connection cable of sender/receiver unit – reflector, 4-wire, 20 m	2048674
Connection cable of sender/receiver unit – reflector, 4-wire, 5 m	2045416
Connection cable of sender/receiver unit – reflector, 4-wire, 50 m	2048675



THE TYPE APPROVED TRANSMISSIOMETER FOR EMISSION MONITORING



Product description

The DUSTHUNTER T100 is a measuring device designed to detect moderate to high dust concentrations. The basic measurand is transmission. Opacity and extinction can be calculated and output, as can the dust concentration after

gravimetric comparison measurement. The measurement system features integrated contamination monitoring. The DUSTHUNTER T100 has been suitability tested in accordance with EN 15267.

At a glance

- For medium to high dust concentrations
- Built-in contamination monitoring
- Automatic check of zero and reference point
- For small to large measuring sections

Your benefits

- Easy installation, commissioning, and operation
- Measurement not dependent on gas velocity, humidity, or particle load
- Low-maintenance thanks to self-monitoring
- Tested for suitability according to EN 15267



More information

Fields of application E-131
 Detailed technical data E-131
 Ordering information E-134
 Dimensional drawings E-134
 Accessories E-137

→ www.sick.com/DUSTHUNTER_T100

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



E

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Monitoring of dust load in factory halls
- Control of fresh air and exhaust air units

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER T100 system

Measurands	Transmission, opacity, relative opacity, extinction, dust concentration										
Performance-tested measurands	Extinction										
Measurement principles	Transmittance measurement										
Spectral range	450 nm ... 700 nm										
Measuring ranges	<table border="0"> <tr> <td style="padding-right: 20px;">Transmission</td> <td>100 ... 80% / 100 ... 0%</td> </tr> <tr> <td style="padding-right: 20px;">Opacity</td> <td>0 ... 20% / 0 ... 100%</td> </tr> <tr> <td style="padding-right: 20px;">Relative opacity</td> <td>0 ... 20% / 0 ... 100%</td> </tr> <tr> <td style="padding-right: 20px;">Extinction</td> <td>0 ... 0.1 / 0 ... 2</td> </tr> <tr> <td style="padding-right: 20px;">Dust concentration</td> <td>0 ... 200 mg/m³ / 0 ... 10,000 mg/m³</td> </tr> </table> <p>The measurement depends on measuring section and particle properties</p>	Transmission	100 ... 80% / 100 ... 0%	Opacity	0 ... 20% / 0 ... 100%	Relative opacity	0 ... 20% / 0 ... 100%	Extinction	0 ... 0.1 / 0 ... 2	Dust concentration	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³
Transmission	100 ... 80% / 100 ... 0%										
Opacity	0 ... 20% / 0 ... 100%										
Relative opacity	0 ... 20% / 0 ... 100%										
Extinction	0 ... 0.1 / 0 ... 2										
Dust concentration	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³										
Certified measuring ranges											
Dust concentration (transmission)	0 ... 0.1 Ext / 0 ... 0.05 Ext / 0 ... 0.2 Ext / 0 ... 0.5 Ext / 0 ... 1 Ext										
Setting time (t₉₀)	1 s ... 600 s freely adjustable										
Accuracy	± 2 %										
Process temperature	-40 °C ... +600 °C										
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa										
Process gas humidity	Non-condensing										
Channel diameter	0.5 m ... 2.5 m 2 m ... 5 m 4 m ... 12 m										
Conformities	Approved for system requiring permission 2001/80/EC (13. BImSchV) (31st German Federal Emission Protection Directive) 2000/76/EC (17. BImSchV) (31st German Federal Emission Protection Directive) 27.BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS 2010/75/EU										
Electrical safety	CE										
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 20%; fault at 30% Manual linearity test using reference filter										
Options	External purge air unit										

DHC-T10 sender/receiver unit

Description	Cross-duct measurement system analyzer unit
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 429 mm (for details, see dimensional drawings)
Weight	≤ 6.5 kg
Power supply	Voltage 24 V
	Supply via control unit
Power consumption	≤ 15 W

DHT-ROx reflector unit

Description	Reflector unit with triple reflector
Enclosure rating	IP 66
Dimensions (W x H x D)	212 mm x 241 mm x 364 mm (for details, see dimensional drawings)
Weight	DHT-R00, DHT-R01, DHT-R02: ≤ 3 kg

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them
Ambient temperature	-40 °C ... +60 °C
Enclosure rating	IP 66
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals
Digital inputs	4 volt-free contacts
Interfaces and bus protocols	Ethernet Modbus TCP (via optional interface module)
	Ethernet OPC (via optional interface module)
	Ethernet SOPAS ET (via optional interface module)
	RS-485 Modbus RTU (via optional interface module)
	RS-485 PROFIBUS DP (via optional interface module)
	RS-485 SOPAS ET (via optional interface module)
	USB SOPAS ET
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"
Operation	Via LC display or SOPAS ET software
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm
Weight	≤ 3.7 kg
Power supply	Voltage 90 ... 250 V
	Version with 24 V DC available as an option
	Frequency 47 to 63 Hz
Power consumption	≤ 15 W



Options	Interface module(s) I/O module(s)
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MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit.														
Gas flow rate	≤ 20 m ³ /h														
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air														
Enclosure rating	IP 66														
Analog outputs	3 outputs: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)														
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)														
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals														
Digital inputs	4 volt-free contacts														
Interfaces and bus protocols	<table border="0"> <tr> <td>Ethernet</td> <td>Modbus TCP (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>OPC (via optional interface module)</td> </tr> <tr> <td>Ethernet</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>Modbus RTU (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>PROFIBUS DP (via optional interface module)</td> </tr> <tr> <td>RS-485</td> <td>SOPAS ET (via optional interface module)</td> </tr> <tr> <td>USB</td> <td>SOPAS ET</td> </tr> </table>	Ethernet	Modbus TCP (via optional interface module)	Ethernet	OPC (via optional interface module)	Ethernet	SOPAS ET (via optional interface module)	RS-485	Modbus RTU (via optional interface module)	RS-485	PROFIBUS DP (via optional interface module)	RS-485	SOPAS ET (via optional interface module)	USB	SOPAS ET
Ethernet	Modbus TCP (via optional interface module)														
Ethernet	OPC (via optional interface module)														
Ethernet	SOPAS ET (via optional interface module)														
RS-485	Modbus RTU (via optional interface module)														
RS-485	PROFIBUS DP (via optional interface module)														
RS-485	SOPAS ET (via optional interface module)														
USB	SOPAS ET														
Display	LC display Status LEDs: "Power", "Maintenance", and "Fault"														
Operation	Via LC display or SOPAS ET software														
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm														
Weight	≤ 13.5 kg														
Power supply	<table border="0"> <tr> <td>Voltage</td> <td>90 ... 250 V Version with 24 V DC available as an option</td> </tr> <tr> <td>Frequency</td> <td>47 to 63 Hz</td> </tr> <tr> <td>Power consumption</td> <td>≤ 70 W</td> </tr> </table>	Voltage	90 ... 250 V Version with 24 V DC available as an option	Frequency	47 to 63 Hz	Power consumption	≤ 70 W								
Voltage	90 ... 250 V Version with 24 V DC available as an option														
Frequency	47 to 63 Hz														
Power consumption	≤ 70 W														
Auxiliary gas connections	Purge air														
Options	Interface module(s) I/O module(s)														

SLV4-2 purge air unit, 2BH1300, 3-ph

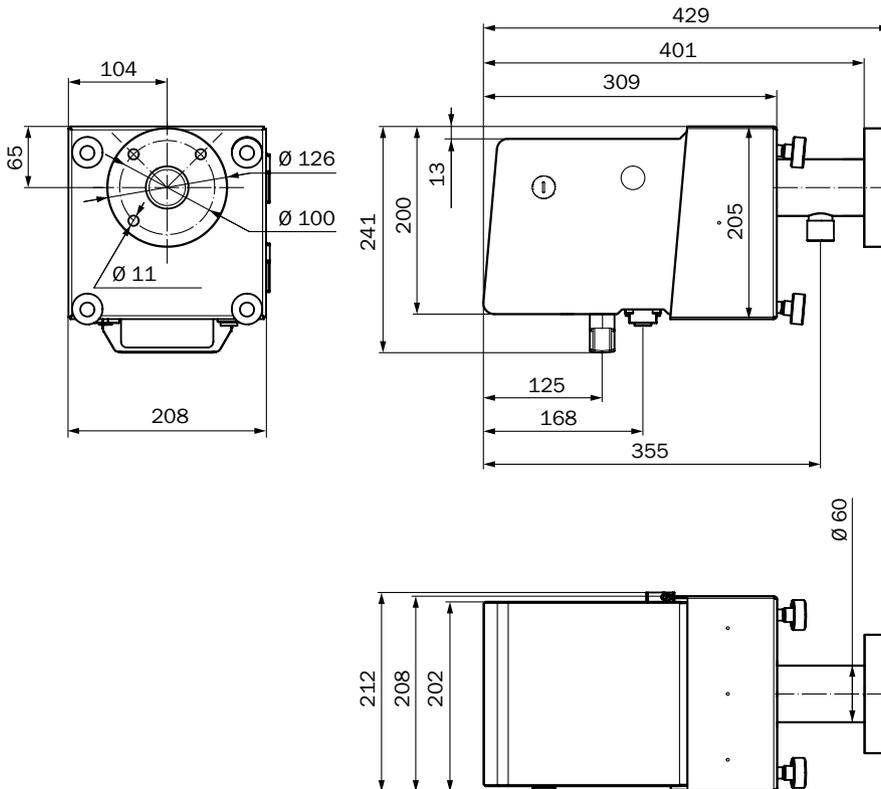
Description	Unit for providing dust-free air for purging optical surfaces	
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g	

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

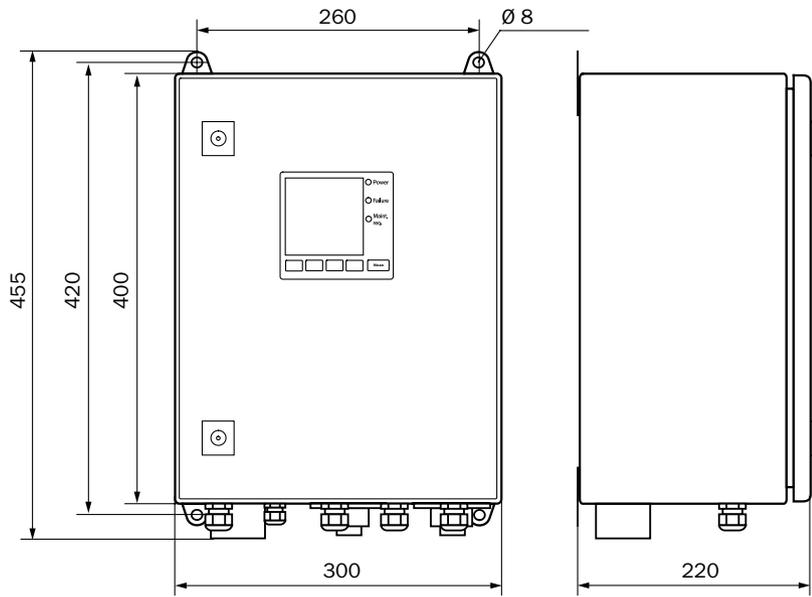
Dimensional drawings (dimensions in mm)

DHC-T10 sender/receiver unit

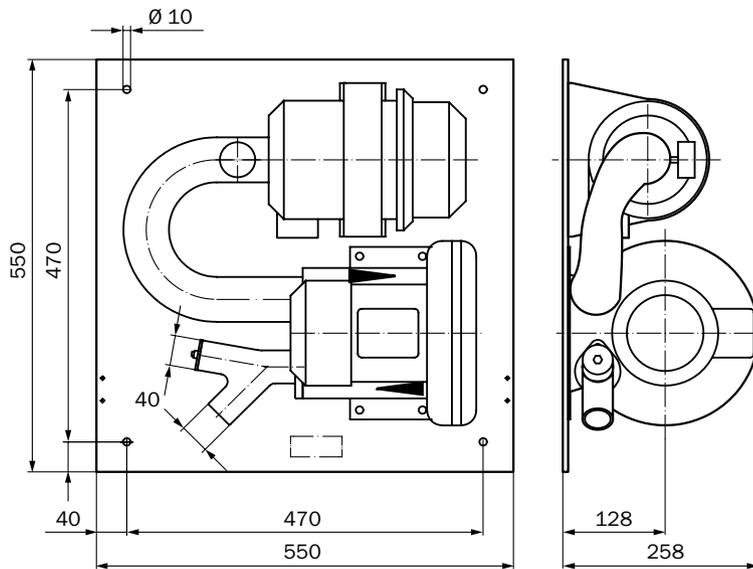


E

MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



E

Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 20%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2048676
Control filter set comprises: filter with approx. 0%, 50% opacity as per EPA, filter holder, lens cloth, connection cable, case with insert	2059426

Sets und kits

Brief description	Part no.
DR290 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085135
OMD41/RM61 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085137
RM41 replacement set consisting of: 1.4571 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084067
RM41 replacement set consisting of: 1.0254 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084068
Mounting set consisting of: spring plates, spherical washers, nuts	2060477
Mounting set consisting of: nuts, washers, spherical washers	2018183

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Adapter flange, for gas temperatures > 150 °C, stainless steel 1.4571	110 mm	150 mm	M10	2018179
Adapter flange, for gas temperatures > 150 °C, structural steel 1.0037	110 mm	150 mm	M10	2019369
Flange with tube, 1.0037 structural steel	500 mm	127 mm	M10	2017849
		100 mm	M10	2017850
	240 mm	100 mm	M10	2017847
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846
Flange with tube suitable for quick-close device, 1.0037 structural steel	130 mm	127 mm	M10	2017839
Flange with tube suitable for quick-close device, 1.4571 stainless steel	240 mm	127 mm	M10	2017841
Flange with tube suitable for quick-close device, 1.0037 structural steel	500 mm	127 mm	M10	2017842
	240 mm	127 mm	M10	2017840

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108

Protective flaps

Brief description	Part no.
Automated quick-closing flap, 2 pieces are required to protect the sender/receiver unit and reflector	6049194

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Adjustment block, two adjustment blocks are needed for alignment	2042907
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

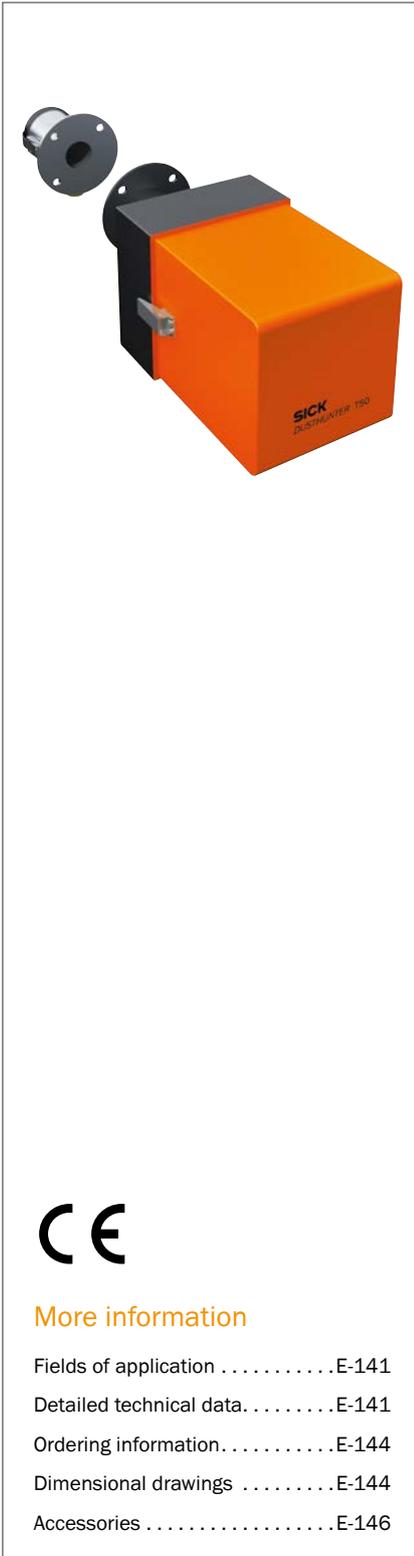
Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977



E

THE TRANSMISSIOMETER FOR MONITORING DUST CONCENTRATION



Product description

The DUSTHUNTER T50 is a reasonably-priced measuring device designed to detect moderate to high dust concentrations above the dew point. The basic measurand is transmission. Based

on this, opacity and extinction can be calculated and output, as can the dust concentration after gravimetric comparison measurement.

At a glance

- For medium to high dust concentrations
- Automatic check of zero and reference point
- For small to medium measurement sections

Your benefits

- Easy installation, commissioning, and operation
- Measurement not dependent on gas velocity, humidity, or particle load
- Low-maintenance thanks to self-monitoring

More information

Fields of application	E-141
Detailed technical data	E-141
Ordering information	E-144
Dimensional drawings	E-144
Accessories	E-146

→ www.sick.com/DUSTHUNTER_T50

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Fields of application

- Emission monitoring in heating systems
- Monitoring of dust concentrations upstream of filter systems
- Dust concentration measurements in cement plants

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER T50 system

Measurands	Transmission, opacity, relative opacity, extinction, dust concentration	
Measurement principles	Transmittance measurement	
Spectral range	450 nm ... 700 nm	
Measuring ranges		
	Transmission	100 ... 50% / 100 ... 0%
	Opacity	0 ... 50% / 0 ... 100%
	Relative opacity	0 ... 50% / 0 ... 100%
	Extinction	0 ... 0.3 / 0 ... 1
	Dust concentration	0 ... 200 mg/m ³ / 0 ... 10,000 mg/m ³
	The measurement depends on measuring section and particle properties	
Setting time (t₉₀)	1 s ... 600 s freely adjustable	
Accuracy	± 2% of the measuring range limit value	
Process temperature	-40 °C ... +600 °C	
Process pressure	With MCU-P control unit: -50 hPa ... 2 hPa With external purge air unit: -50 hPa ... 30 hPa	
Process gas humidity	Non-condensing	
Channel diameter	0.5 m ... 2.5 m 2 m ... 5 m 4 m ... 8 m	
Electrical safety	CE	
Test functions	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter	
Options	External purge air unit	

DHC-T00 sender/receiver unit

Description	Cross-duct measurement system analyzer unit	
Ambient temperature	-40 °C ... +60 °C	
Enclosure rating	IP 66	
Dimensions (W x H x D)	198 mm x 216 mm x 398 mm (for details, see dimensional drawings)	
Weight	≤ 5 kg	
Power supply		
	Voltage	24 V Supply via control unit
	Power consumption	≤ 15 W

DHT-R5x reflector unit

Description	Reflector unit with triple reflector	
Enclosure rating	IP 66	
Dimensions (W x H x D)	126 mm x 131 mm x 139 mm (for details, see dimensional drawings)	
Weight	DHT-R50, DHT-R51, DHT-R52: ≤ 1 kg	

MCU-N control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them	
Ambient temperature	-40 °C ... +60 °C	
Enclosure rating	IP 66	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: V 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	
Interfaces and bus protocols	Ethernet	Modbus TCP (via optional interface module)
	Ethernet	OPC (via optional interface module)
	Ethernet	SOPAS ET (via optional interface module)
	RS-485	Modbus RTU (via optional interface module)
	RS-485	PROFIBUS DP (via optional interface module)
	RS-485	SOPAS ET (via optional interface module)
	USB	SOPAS ET
Display	LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"	
Operation	Via LC display (option) or SOPAS ET software	
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm	
Weight	≤ 3.7 kg	
Power supply	Voltage	90 ... 250 V Version with 24 V DC available as an option
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W
Options	Interface module(s) I/O module(s)	

MCU-P control unit

Description	Unit for controlling the system components and evaluating and outputting the data provided by them. With integrated purge air unit.	
Gas flow rate	≤ 20 m³/h	
Ambient temperature	-40 °C ... +45 °C Suction temperature for the purge air	
Enclosure rating	IP 66	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs when using I/O modules (option)	
Analog inputs	2 inputs: 0... 20 mA, Not electrically isolated; two additional inputs when using I/O modules (option)	
Digital outputs	5 relay contacts: 48 V, 1 A Volt-free; for status signals	
Digital inputs	4 volt-free contacts	



Interfaces and bus protocols		Ethernet	Modbus TCP (via optional interface module)
		Ethernet	OPC (via optional interface module)
		Ethernet	SOPAS ET (via optional interface module)
		RS-485	Modbus RTU (via optional interface module)
		RS-485	PROFIBUS DP (via optional interface module)
		RS-485	SOPAS ET (via optional interface module)
		USB	SOPAS ET
Display		LC display (optional) Status LEDs: "Power", "Maintenance", and "Fault"	
Operation		Via LC display (option) or SOPAS ET software	
Dimensions (W x H x D)		300 mm x 455 mm x 220 mm	
Weight		≤ 13.5 kg	
Power supply		Voltage	90 ... 250 V Version with 24 V DC available as an option
		Frequency	47 to 63 Hz
		Power consumption	≤ 70 W
Auxiliary gas connections		Purge air	
Options		Interface module(s) I/O module(s)	

SLV4-2 purge air unit, 2BH1300, 3-ph

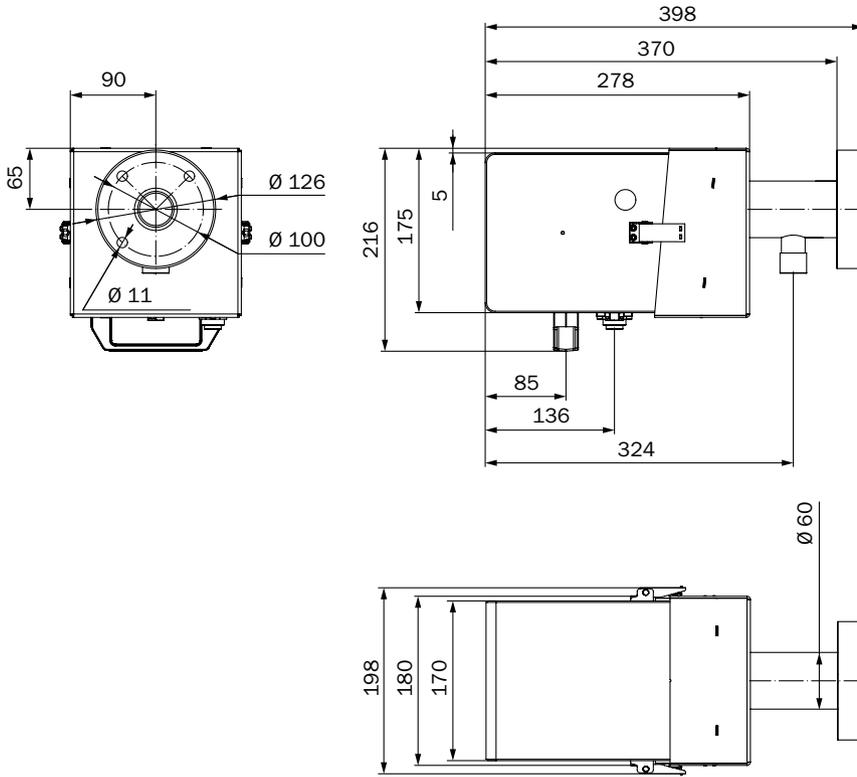
Description		Unit for providing dust-free air for purging optical surfaces	
Gas flow rate		38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature		-20 °C ... +40 °C	
Enclosure rating		IP 54	
Dimensions (W x H x D)		550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight		18 kg	
Power supply		3-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections		Purge air: 40 mm	
Test functions		Low-pressure monitor (switching point -35 hPa)	
Integrated components		Two-level air filter, type Europiclone, dust capacity 200 g	

Ordering information

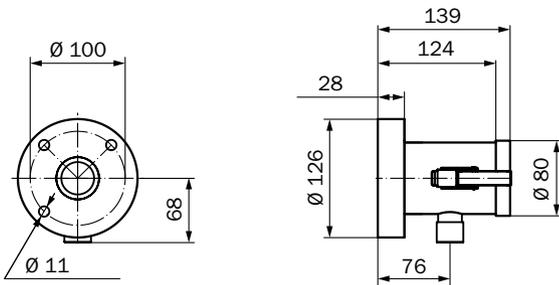
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

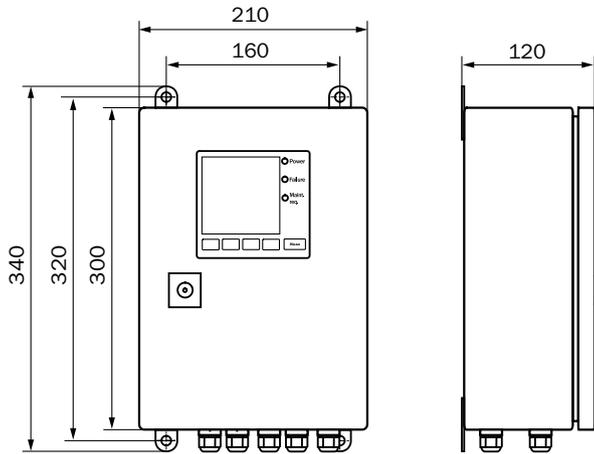
DHC-T00 sender/receiver unit



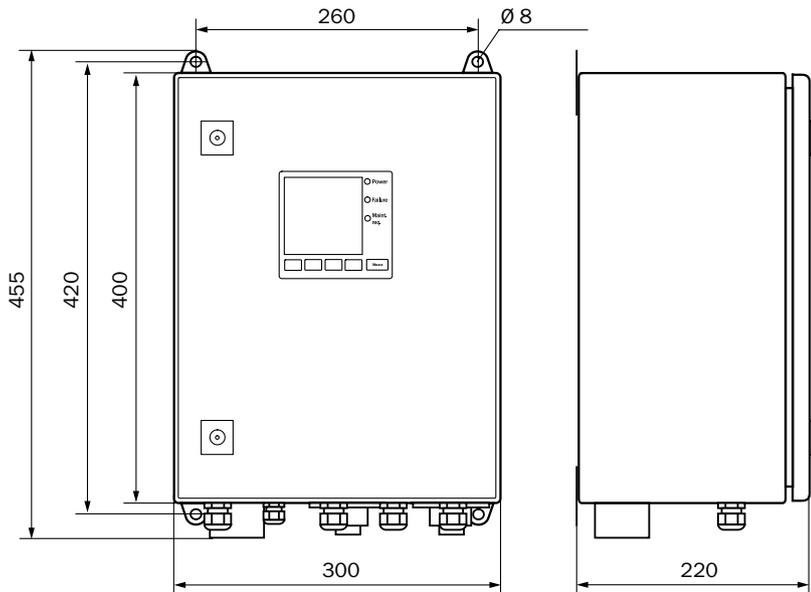
DHT-R5x reflector unit



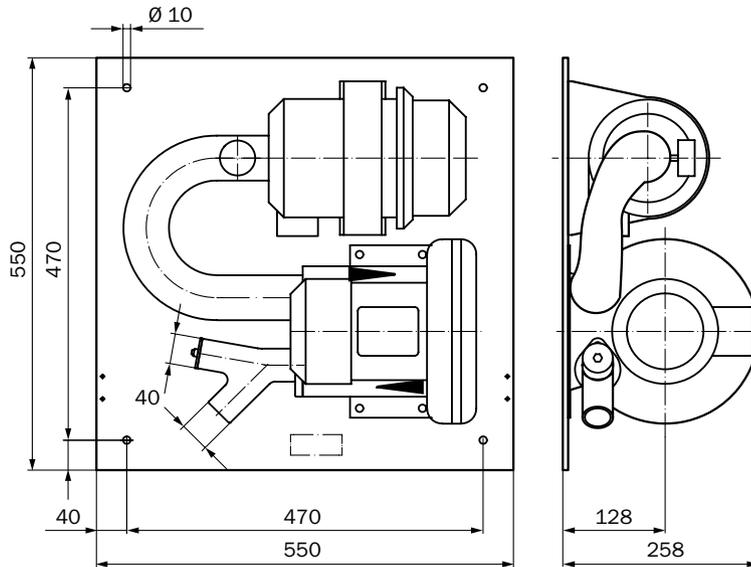
MCU-N control unit; wall housing, compact version (only for non-Ex-zones)



MCU-P control unit; wall housing, compact version (only for non-Ex-zones)



SLV4-2 purge air unit, 2BH1300



Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 20%, 40%, 60%, 80% transmission, filter holder, lens cloth, connection cable, case with insert	2048676

Sets und kits

Brief description	Part no.
DR290 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085135
OMD41/RM61 replacement set consisting of: mounting kits, sealing strips, small spare parts kit, information document	2085137
RM41 replacement set consisting of: 1.4571 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084067
RM41 replacement set consisting of: 1.0254 steel adapter flanges, mounting kits for mounting flanges, sealing strips, distance sleeves, nuts and washers, small spare parts kit, information document	2084068
Mounting set consisting of: spring plates, spherical washers, nuts	2060477
Mounting set consisting of: nuts, washers, spherical washers	2018183

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm



Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Adapter flange, for gas temperatures > 150 °C, stainless steel 1.4571	110 mm	150 mm	M10	2018179
Adapter flange, for gas temperatures > 150 °C, structural steel 1.0037	110 mm	150 mm	M10	2019369
Flange with tube, 1.0037 structural steel	500 mm	127 mm	M10	2017849
		100 mm	M10	2017850
	240 mm	100 mm	M10	2017847
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017848

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for analyzer extended for quick-close flap, aluminum, painted	2065677
Weather hood for external blower unit, aluminum, painted	5306108

Protective flaps

Brief description	Part no.
Automated quick-closing flap, 2 pieces are required to protect the sender/receiver unit and reflector	6049194

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Adjustment block, two adjustment blocks are needed for alignment	2042907
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

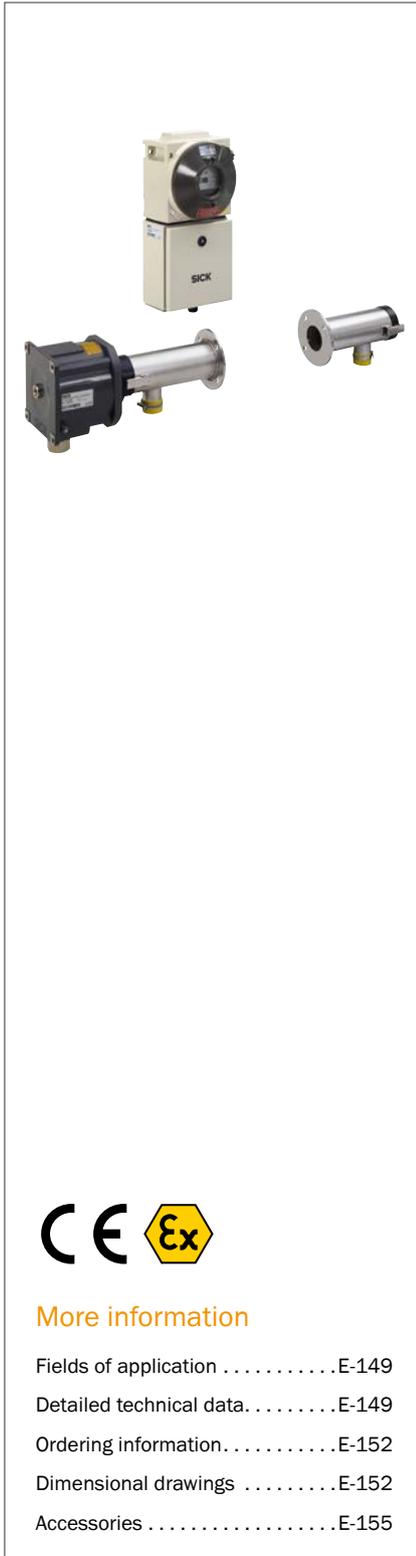
Connecting cables with female connector

Brief description	Part no.
Connection cable, slave, for connection of S/R units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/R units, 5-wire, 5 m	7042017

Connecting cables with male connector

Brief description	Part no.
Connecting cable for optional I/O modules, can be used for several modules	2040977

THE RELIABLE DUST MEASURING DEVICE FOR EXPLOSION-HAZARDOUS AREAS



Product description

Regardless whether it is transmission, opacity, extinction, or dust concentration, with the FW300 Ex, these measurands can be selected freely. Sticky dusts, high gas temperatures, or fluctuating gas velocities, the FW300 Ex also

measures under unfavorable conditions with high accuracy practically in real time. A pressure-resistant encapsulated and dust-proof version is also available for applications in explosion-hazardous areas.

At a glance

- For medium to high dust concentrations
- Automatic check of zero and reference point
- Device versions for Ex-zone 1, 2 and 22
- For small to medium measurement sections

Your benefits

- Simple operation
- Minimum maintenance required
- Measurements in explosion-hazardous areas



More information

Fields of application E-149
 Detailed technical data E-149
 Ordering information E-152
 Dimensional drawings E-152
 Accessories E-155

→ www.sick.com/FW300_Ex

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



E

Fields of application

- Monitoring of filter systems for filter break
- Monitoring of dust load in factory halls
- Emission monitoring in industrial plants
- Measurement of dust emissions in stockpiles, in quarries and grinding plants
- Measurements in potentially explosive atmospheres

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

FW300 Ex system

Measurands	Transmission, opacity, extinction, dust concentration	
Measurement principles	Transmittance measurement	
Spectral range	640 nm ... 660 nm laser, protection class 2, power < 1 mW	
Measuring ranges	Transmission	100 ... 80% / 100 ... 0%
	Opacity	0 ... 20% / 0 ... 100%
	Extinction	0 ... 0.1 Ext / 0 ... 2.5 Ext
	Dust concentration	0 ... 13 mg/m ³ / 0 ... 12,000 mg/m ³
	The measurement depends on measuring section and particle properties	
Setting time (t₉₀)	0.1 s ... 600 s freely adjustable	
Accuracy	Transmission:	± 0.4%
	Opacity:	± 0.4%
	Extinction:	± 0.002 Ext
	Dust concentration:	± 2 %
Process temperature	0 °C ... +600 °C	
Process pressure	-50 hPa ... 30 hPa	
Process gas humidity	Non-condensing	
Channel diameter	0.5 m ... 2 m 1.5 m ... 8 m	
Electrical safety	CE	
Operation	Via MEPA software	
Test functions	Automatic self-test (linearity, drift, aging) Manual linearity test using reference filter	

FWSE300 Ex sender/receiver unit

Description	Cross-duct measurement system analyzer unit	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	Zone 1 and 2: II 2G Ex IIC T6 Zone 22: II 3D Ex t IIIB T80 °C DC IP 54
Enclosure rating	IP 65	
Dimensions (W x H x D)	160 mm x 200 mm x 191 mm (for details, see dimensional drawings)	
Weight	≤ 4.6 kg	
Power supply	Voltage	24 V Supply via the connecting unit
	Power consumption	≤ 4 W

FW-R-055-D rotating reflector

Description	Reflector unit with glass triple reflector	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	Zone 1 and 2: II 2G Ex IIC T6 Zone 22: II 2G Ex IIC T6
Enclosure rating	IP 65	
Dimensions (W x H x D)	160 mm x 200 mm x 191 mm (for details, see dimensional drawings)	
Weight	4.7 kg	
Power supply	Voltage	24
		Supply via the connecting unit
	Power consumption	≤ 12 W

FW-R-055-F fixed reflector

Description	Reflector unit with glass triple reflector	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 65	
Dimensions (W x H x D)	80 mm x 80 mm x 34 mm (for details, see dimensional drawings)	
Weight	0.4 kg	

AK1-Ex connecting unit

Description	Unit for connecting the data lines and energy supply of the system components; for use in explosion-hazardous areas	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	II 2G Ex de IIC T6
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display	
Dimensions (W x H x D)	210 mm x 493 mm x 180 mm (for details, see dimensional drawings)	
Weight	13.3 kg	
Power supply	Voltage	100 ... 240 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W

AK1-Ex22 connecting unit

Description	Unit for connecting the data lines and energy supply of the system components; for use in dust explosion-hazardous areas	
Ambient temperature	-20 °C ... +40 °C	
Ex approvals	ATEX	II 2D Ex tD A21 T80 °C IP6x
Enclosure rating	IP 65	
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; second output as an option	
Digital outputs	3 relay contacts: 48 V, 1 A Volt-free; for "Operation/Fault", "Limit value", "Maintenance" status signals	
Digital inputs	1 input: Volt-free; for maintenance switch	
Interfaces and bus protocols	RS-232	Proprietary service interface
Display	Two-line LC display	
Dimensions (W x H x D)	200 mm x 300 mm x 155 mm (for details, see dimensional drawings)	
Weight	4.9 kg	
Power supply	Voltage	100 ... 240 V Optional: 24 V DC ± 2 V
	Frequency	47 to 63 Hz
	Power consumption	≤ 15 W

FW-V purge air attachment

Description	Flange attachment with connection for purge air
Dimensions (W x H x D)	126 mm x 126 mm x 200 mm (for details, see dimensional drawings)
Weight	1.4 kg

SLV5-2 purge air unit, 2BH1300, ATEX 3/2D

Description	Unit for providing dust-free air for purging optical surfaces; for use in dust explosion-hazardous areas	
Gas flow rate	38 m³/h ... 63 m³/h at 30 hPa counterpressure, depending on underpressure in filter	
Ambient temperature	-20 °C ... +40 °C	
Enclosure rating	IP 54	
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)	
Weight	18 kg	
Power supply	3-phase current	3-phase, Δ: 230 V, 50 Hz, 2.4 A, 550 W 3-phase, Y: 400 V, 50 Hz, 1.4 A, 550 W
Auxiliary gas connections	Purge air: 40 mm	
Test functions	Low-pressure monitor (switching point -35 hPa)	
Integrated components	Two-level air filter, type Europiclone, dust capacity 200 g	

SLV5-1 purge air unit, 2BH1300, ATEX 3/2G

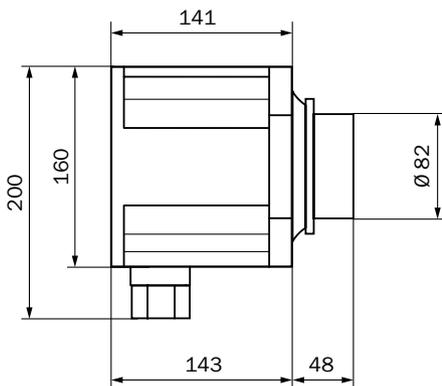
Description	Unit for providing dust-free air for purging optical surfaces; for use in explosion-hazardous areas
Gas flow rate	38 m ³ /h ... 63 m ³ /h at 30 hPa counterpressure, depending on underpressure in filter
Ambient temperature	-20 °C ... +40 °C
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details, see dimensional drawings)
Weight	18 kg
Power supply	3-phase current 3-phase, Δ: 230 V, 50 Hz, 2.4 A, 550 W 3-phase, Y: 400 V, 50 Hz, 1.4 A, 550 W
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-level air filter, type Europiclön, dust capacity 200 g

Ordering information

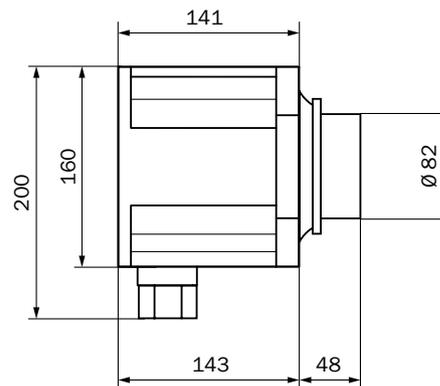
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

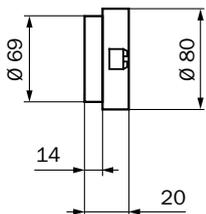
FWSE300 Ex sender/receiver unit



FW-R-055-D rotating reflector

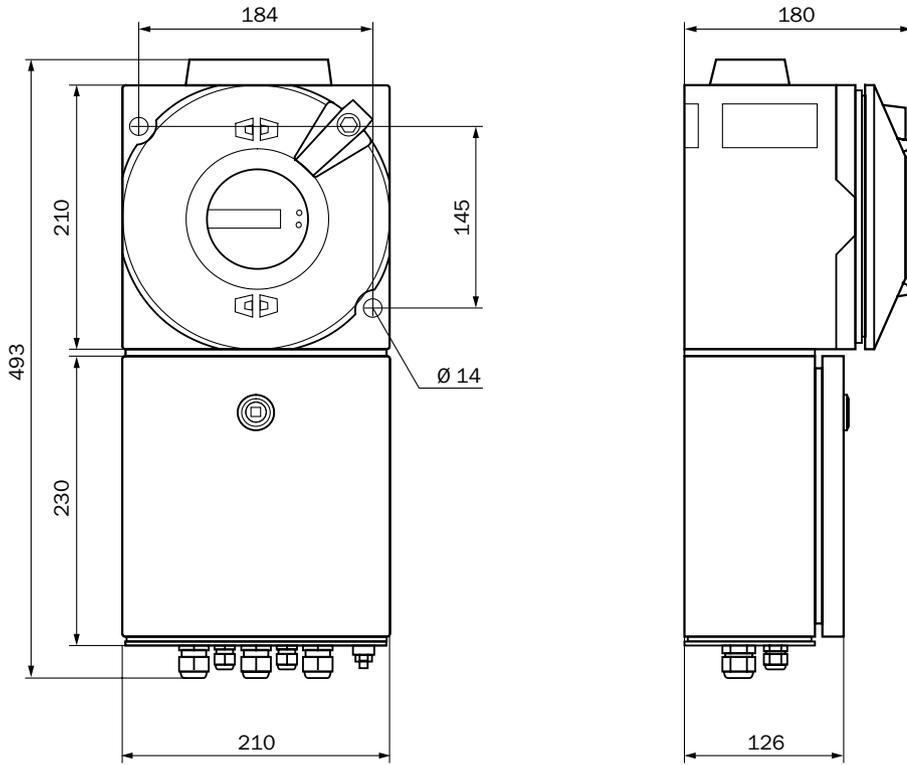


FW-R-055-F fixed reflector

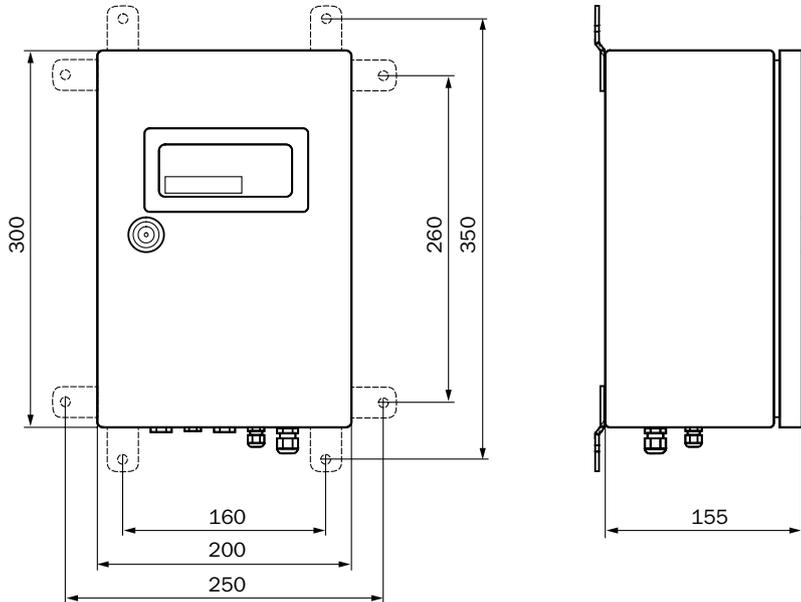


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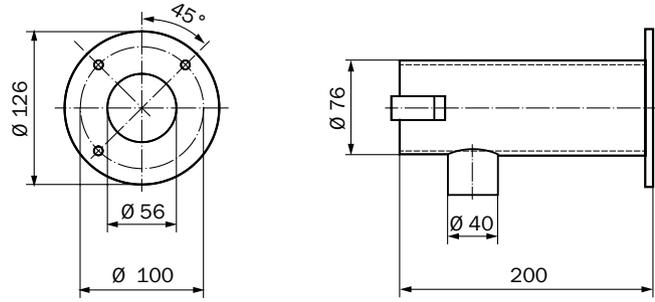
AK1-Ex connecting unit



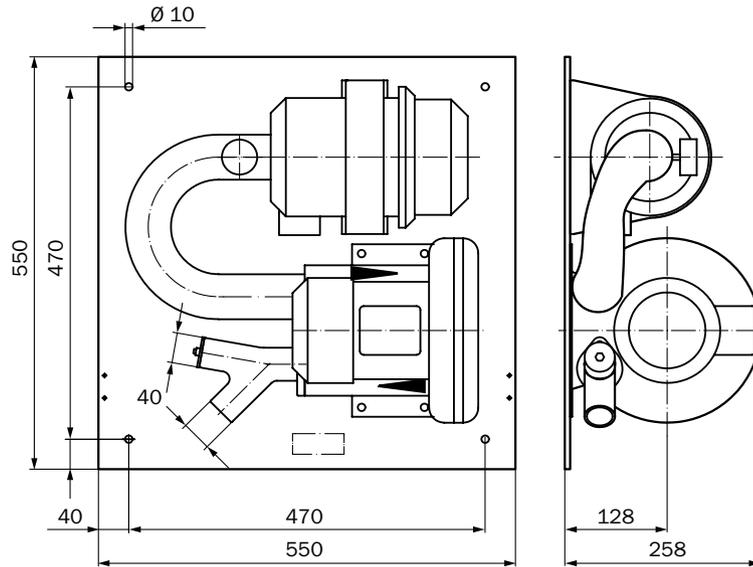
AK1-Ex22 connecting unit



FW-V purge air attachment



SLV5 purge air unit, 2BH1300, Ex



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Accessories

Test and monitoring tools

Brief description	Part no.
Control filter set consists of: filter with approx. 0%, 35%, 60%, 85% transmission, filter holder, lens cloth, case with insert	7040404

Sets und kits

Brief description	Part no.
Mounting set consisting of: nuts, washers	2018184
Mounting set consisting of: nuts, washers, spherical washers	2018183

Flanges

Weld-in flange

- **Interior diameter:** 70.2 mm

Brief description	Nominal length	Hole circle diameter	Thread size	Part no.
Flange with tube, 1.0037 structural steel	500 mm	127 mm	M10	2017849
Flange with tube, 1.4571 stainless steel	130 mm	127 mm	M10	2017846
Flange with tube, 1.0037 structural steel	130 mm	100 mm	M10	2017845
Flange with tube, 1.4571 stainless steel	240 mm	100 mm	M10	2017848
Flange with tube, 1.0037 structural steel	240 mm	100 mm	M10	2017847
	500 mm	100 mm	M10	2017850

Device protection (mechanical)

Protective housing and tubes

Brief description	Part no.
Weather hood, aluminum, painted	2702407
Weather hood for analyzer, 1.4301 stainless steel	2047253
Weather hood for external blower unit, aluminum, painted	5306108

Clamp and alignment brackets

Alignment brackets

Brief description	Part no.
Adjustment mount for zero point setting	7040131
Optical adjustment unit for flange mounting	1700462

Plug connectors and cables

Other plug connectors and cables

Brief description	Part no.
RS 232 interface cable, 2 m	7040012

E



GRAVIMETRIC DUST MEASUREMENT DEVICES

Easy setup, precise measurement

Gravimetric dust measurement devices extract a partial gas flow from the duct under predefined conditions and use a filter to separate out the dust particles. The amount of dust is ascertained by weighing the filter. The differential pressure is measured to determine the

extracted volume. These two values are then used to calculate the concentration of dust in the duct with a high level of accuracy. Gravimetric dust measurement is ideal for calibrating other dust measuring devices and for taking the kinds of comparative measurements that are

required by the relevant authorities.

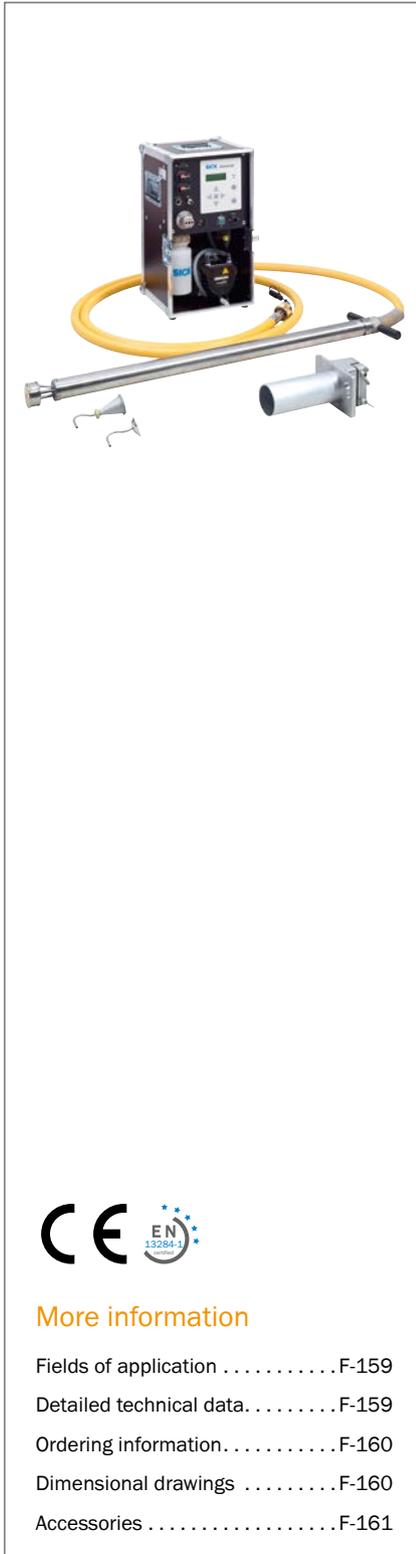
Your benefits

- High measurement accuracy, even with very low dust concentrations
- Measurement results available immediately after sampling



SHC500 Gravimat **F-158**
Mobile measurement system for gravimetric dust concentration measurements

MOBILE MEASUREMENT SYSTEM FOR GRAVIMETRIC DUST CONCENTRATION MEASUREMENTS



Product description

The SHC500 Gravimat is used for gravimetric measurements for calibration of dust monitors and for comparison measurements on filter plants. A partial gas flow is extracted isokinetically via a filter

head probe. This is controlled automatically and in real time. The dust content is determined by weighing the dust collector mass before and after extraction.

At a glance

- Nearly no dust loss due to optimized sampling system
- Automatic data recording and system control
- Isokinetic control in real time
- Automatic storage and evaluation of the measuring values
- Automatic measurement of the flow angle and detection of swirl effects

Your benefits

- High measuring accuracy also at low dust concentrations
- Measurement results are available immediately after sampling
- Due to compact design and low number of components, only one person necessary for transport and operation



More information

Fields of application	F-159
Detailed technical data	F-159
Ordering information	F-160
Dimensional drawings	F-160
Accessories	F-161

→ www.sick.com/SHC500_Gravimat

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Fields of application

- Calibration of continuous dust measuring devices
- Compliance measurements at filter plants
- Occasional check measurements
- Flow and temperature profile measurements, determination of the flow direction

Detailed technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

SHC500 Gravimat system

Measurands	Dust concentration
Gas flow rate	0.7 m ³ /h ... 3 m ³ /h
Measuring ranges	Dust concentration 0.1 ... 200 mg/m ³ / 50 ... 50,000 mg/m ³
Accuracy	Volume flow measurement: < 1% of the maximum throughput
Process temperature	With out air cooling: ≤ +250 °C With air cooling: ≤ +400 °C High temperature version: ≤ +600 °C
Process pressure	-50 hPa ... 50 hPa
Process gas velocity	2 m/s ... 48 m/s
Ambient temperature	-10 °C ... +50 °C
Conformities	EN 13284-1 U.S. EPA conform
Electrical safety	CE
Enclosure rating	Closed: IP 65 Open: IP 54
Analog inputs	2 inputs: 0 ... 20 mA only SHC502
Interfaces and bus protocols	RS-232 For printer or PC connection
Display	Four-line LC display
Operation	Via LC display and function buttons SHC502 version also via operating software
Dimensions (W x H x D)	310 mm x 550 mm x 290 mm (AE50x automatic unit)
Weight	24 kg AE50x automatic unit
Power supply	Voltage 115 V / 230 V Frequency 50 Hz / 60 Hz Power consumption ≤ 400 W
Auxiliaries	Cooling air: 5 m ³ /h ... 10 m ³ /h
Integrated components	Control and evaluation electronics Suction pump (rotary vane pump) Pressure sensors Condensing vessel (0.8 l, plastic)

GS5 filter head probe

Description	Probe head with integrated intake for dust collector, with pressure measurement points for isokinetic control of the suction process and with temperature sensor for precise measurement of the gas temperature
Dimensions (W x H x D)	Details, see dimensional drawings
Weight	Probe length 1 m: 7.3 kg
Mounting	Installation opening: diameter ≥ 80 mm

HC dust collector

Description	Collector for higher dust concentrations (50 ... 50,000 mg/m ³)
Suction diameter	4.2 mm / 5.2 mm / 6.4 mm / 8 mm / 10 mm / 11.5 mm
Weight	Funnel: 25 g Sample tube: 22 g
Material	Aluminum (funnel), brass/stainless steel (sample tube)

LC dust collector

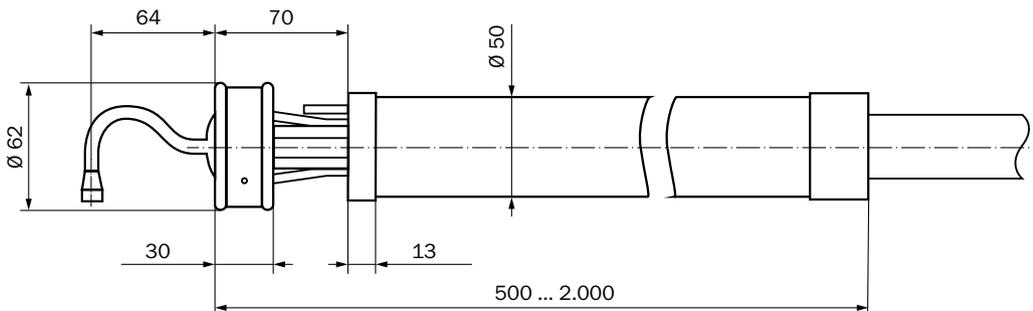
Description	Collector for low dust concentrations (0.1 ... 200 mg/m ³)
Suction diameter	4.2 mm / 5.2 mm / 6.4 mm / 8 mm / 10 mm / 11.5 mm
Weight	16 g
Material	Stainless steel

Ordering information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings (dimensions in mm)

GS5 filter head probe



Accessories

Sets und kits

Brief description	Part no.
Test equipment set consists of: test shutter, pressure test adapter, hoses, test connectors, disposable syringe, case with inlay	7040202

Flanges

Weld-in flange

- **Short description:** Flange with tube, with cover and seal, 1.0037 structural steel

Nominal length	Interior diameter	Hole circle diameter	Thread size	Part no.
200 mm	80 mm	125 mm	M12	7040022
113 mm	76.2 mm	125 mm	M12	7040023

Other mounting accessories

Miscellaneous

Brief description	Part no.
Extension for GS5 probe, length 500 mm	7040102
Extension for GS5 probe, length 1500 mm	7040024
Extension for GS5 probe, length 1000 mm	7040104
1 m carrying case for filter head probe and two extensions	7040002
1.5 m carrying case for filter head probe and two extensions	7040184
2 m carrying case for filter head probe and two extensions	4050003
Flight case for transporting power supply unit, cables, tools, etc.	7040027

Plug connectors and cables

Other plug connectors and cables

Brief description	Part no.
RS 232 interface cable, 2 m	7040012

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 7,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com