Competence in Solids
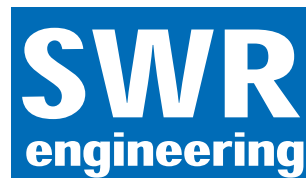
GLOBAL
TECHNOLOGY SYSTEMS

SWR
engineering

AirSafe

Continuous ambient air dust monitoring

Applications

Triboelectric sensor technology from SWR has proven itself in thousands of applications for measuring dust concentrations in process systems.

AirSafe is a new measuring instrument which can monitor the dust concentration in ambient air, for example in control system areas, silo areas, boiler houses or work stations.

AirSafe monitors concentrations on the basis of pre-set limit values.
For example, to avoid the accumulation of dust in explosion zones or to detect unnoticed accumulation of dust from processes.

AirSafe can be used as early detection for dust which could endanger the workplace.

Operation

AirSafe consists of a flow duct and an integral triboelectric dust sensor.
A current of air is drawn through the duct at approximately 100 m³ /h.
Dust particles, carried in the air current, passes the sensor, this generates a charge transfer, which is used as the measurement signal.
This signal is converted to electrical process outputs which could be used for display or control.
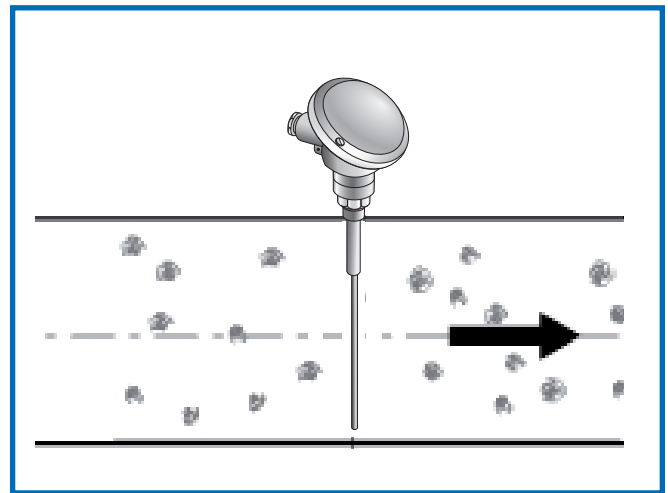
Description

The AirSafe flow duct is 500 mm long and 100 x 100 mm square.

The integral dust sensor has a relay output which energises when the set limit value is exceeded.
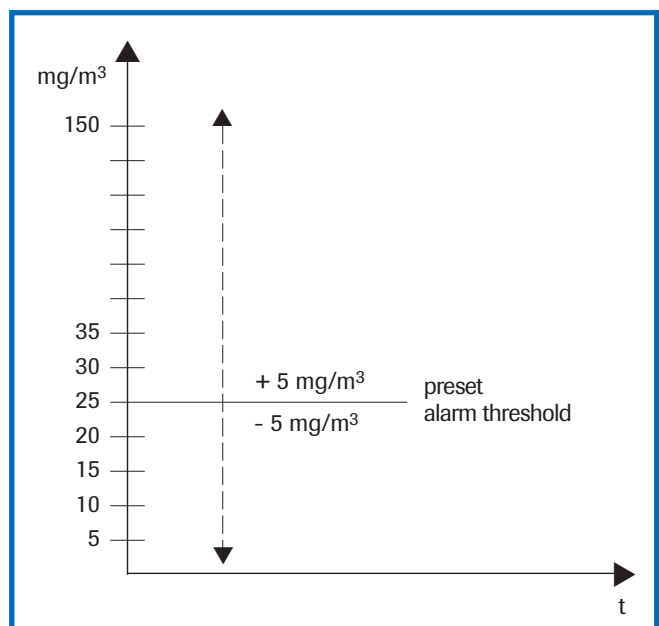
The unit is supplied pre-calibrated.
The trip point is set to approximately 25 mg/m³ of dust.

The user can set his own alarm threshold.
This may be set within a range of approximately 5 mg/m³ to 150 mg/m³.

The trip point can be changed in steps of 5 mg by simply pressing a button.

As well as a contact closure output, the sensor also has an RS 485 output which can be connected to a wall mount or DIN rail mount transmitter.
The output from the transmitter is a standard 4…20 mA process output which can be used for process control. The transmitter also has a ModBus RTU RS 485 output which can also be used for process control and computer interface.

By using the visualisation software, up to 10,000 measuring points can be displayed and saved and can be interfaced to other computer programmes, e. g. Excel.
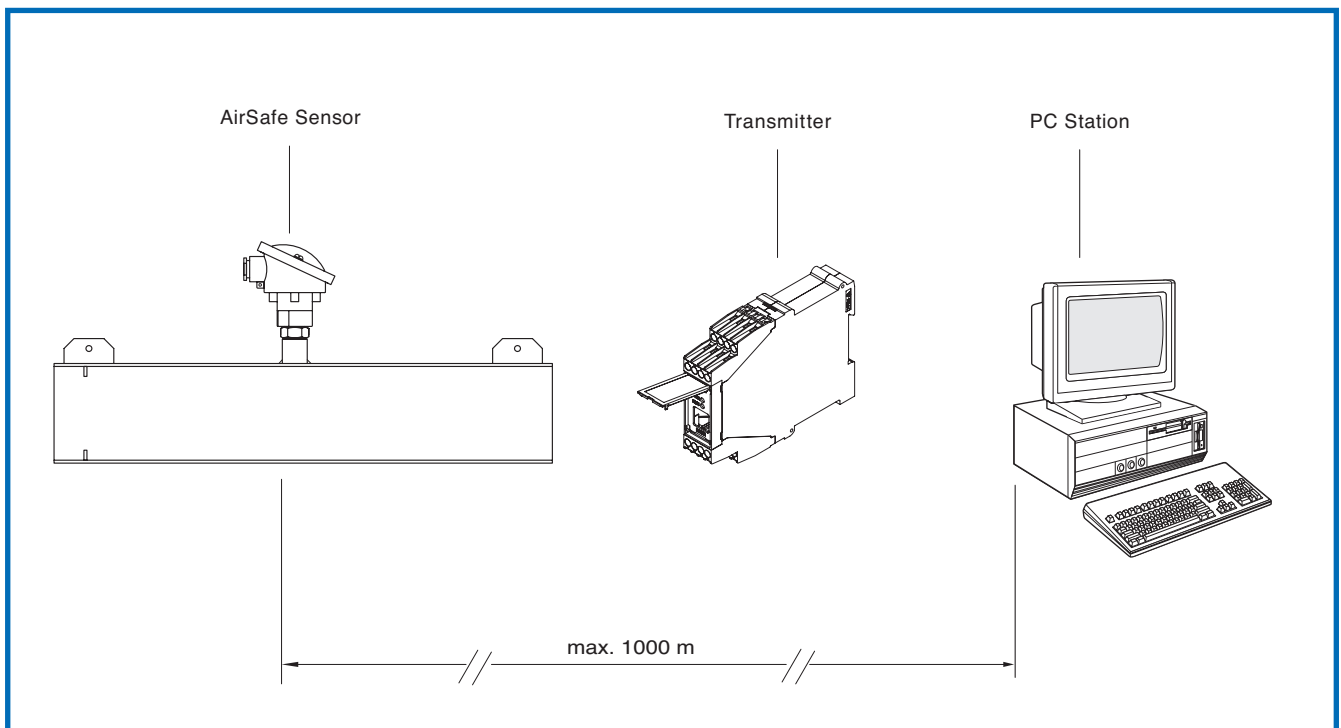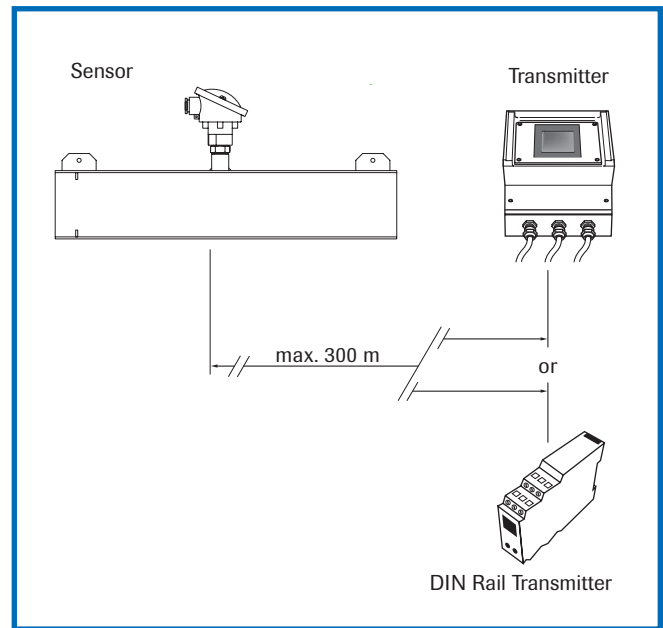
Assembly and installation

AirSafe can be installed anywhere in a room.

Because AirSafe has excellent ambient temperature characteristics (max. 60 °C), there is no need to maintain distances from units or walls.

AirSafe can be wall-mounted using brackets provided.

Benefits

- The creation of dust explosion zones can be prevented.

- Dust concentrations at work stations are safely monitored.

- Possible dust escape from system parts is quickly detected.

Technical data

AirSafe duct detector	
Measured objects	Solid particles in a stream of gas
Particle size	0.3 µm or larger
Measurement range	From 0.1 mg/m³
Ambient temperature	- 20 . . . + 60°C
Humidity	95 % RH (non-condensing)
Measurement principle	Triboelectric
Damping time	1 s
Output signals	Relay output, either NC or NO
Dimensions	500 x 100 x 240 (L x W x H)
Housing material	Aluminium
Protection type	IP 65
Voltage supply	24 ± 10 % V DC
Rating	1 W
Electrical connection	Screw terminals
Weight	5.5 kg
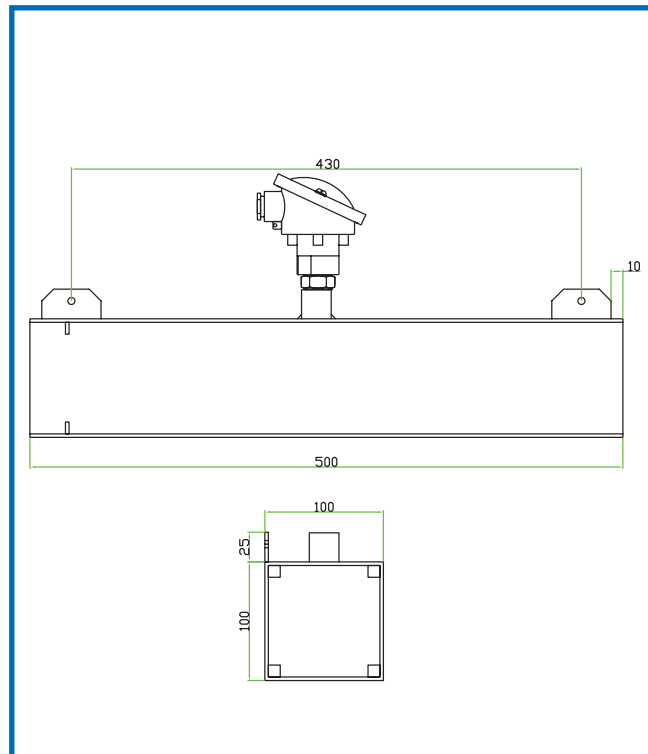
Transmitter (field housing)	
Supply voltage	110 / 230 V, 50 Hz, 24 V DC
Power consumption	20 W / 24 VA
Current input	Max. 1 A at 24 V
Protection type	IP 65 to EN 60 529/10.91
Ambient operating temperature	-10 … +45°C
Dimensions	258 x 237 x 174 (W x H x D)
Weight	Approx. 2.5 kg
Interface	RS 485
Cable screw connectors	3 x M16 (4.5-10 mm Ø)
Connection terminals conductor cross-section	0.2 - 2.5 mm² [AWG 24-14]
Current or voltage output	4 … 20 mA (0 … 20 mA), load < 700 Ω or 2 … 10 V (0 … 10 V), load > 2 kΩ
Measurement alarm switch output 3x	Relay with switchover contact Max. 250 V AC, 1 A
Summator	Reset function
Data backup	Flash memory
Pulse output	Open Collector
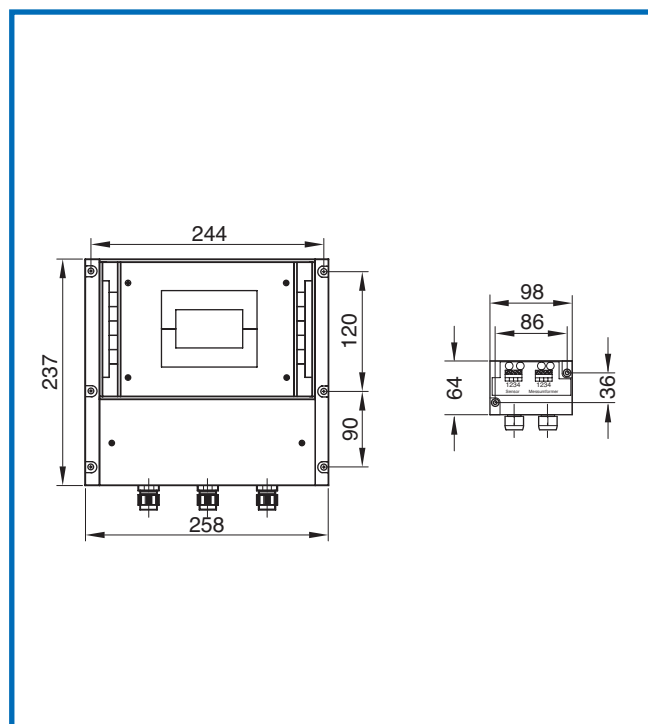
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(Subject to technical modifications at any time.)