SIEMENS

Fine Dust Sensors

Frequently Asked Questions FAQ

Frequently Asked Questions (FAQ)

Fine Dust - Background Information

What are fine dust particles?

Fine dust particles are contained in airborne particulate matter – invisible to the naked eye. These microscopically small particles are on average 10 microns in diameter.

What are the sources of fine dust?

Fine dust is emitted by automobiles, industry, power stations, fuel burning, agriculture, and some natural sources, such as deserts. Naturally, the fine dust sources differ from place to place.

Why do fine dust particles represent a worldwide problem?

Fine dust pollution matters to every one of us. The particles enter the nose, mouth and throat and can even penetrate deep into the lungs, causing lung and cardiovascular diseases. According to the EEA (European Environment Agency), 400,000 people per year die prematurely in the European Union due to fine dust pollution. The rate of fatalities in China and India is even higher.

What is the Air Quality Index?

The Air Quality Index (AQI) is a number used by government agencies to communicate to the public how polluted the air currently is, or how polluted it is forecast to become.
It is calculated based on multiple pollutants: PM2.5, PM10, ozone, NO2, SO2, and CO.
As the AQI rises, an increasingly large percentage of the population is likely to experience severe adverse health effects. A number of countries have their own air quality indices, corresponding to different national air quality standards.

What is the meaning of PM2.5 and PM10?

PM2.5 means Particulate Matter having a diameter of 0.3…2.5 microns. PM2.5 is particularly hazardous due to the followings factors:

- Because of their light weight, the fine dust particles remain longer in the air
- Longer times in the air means that people become infected more easily
- The particles are too small to be filtered by the throat and the lungs, so they can enter the blood stream

PM10 means Particulate Matter having a diameter of 0.3…10 microns. Mold measures about 8 microns. It is thus part of PM10, which can cause respiratory diseases. Both PM2.5 and PM10 are referred to as fine dust.

What is the benefit of measuring and controlling fine dust?

People in western countries spend about 90 percent of their time indoors. Fine dust puts people at risk of developing lung cancer and cardiovascular diseases. For this reason, a fine dust-controlled room means preventive healthcare.

Fine Dust Sensors – Features, Functions, Benefits

What is the measuring principle for fine dust?

The sensors use the laser light scattering method to measure the size of the fine dust particles and to count their number sucked into the device by a built-in fan. Based on this information, the fine dust concentration in µg/m3 is determined.

What are the sensors' fields of use?

- Monitoring and visualization
- Control by means of filtering, for example

Why is there a need to exchange the sensor module?

The fan also sucks larger dust particles into the sensor module; they get clotted after a certain time. In addition, the laser has a limited lifetime. All types of fine dust sensors suffer from these effects. With the QSA.. fine dust sensors from Siemens, the user does not have to buy and reconfigure a new sensor but only needs to replace the module.

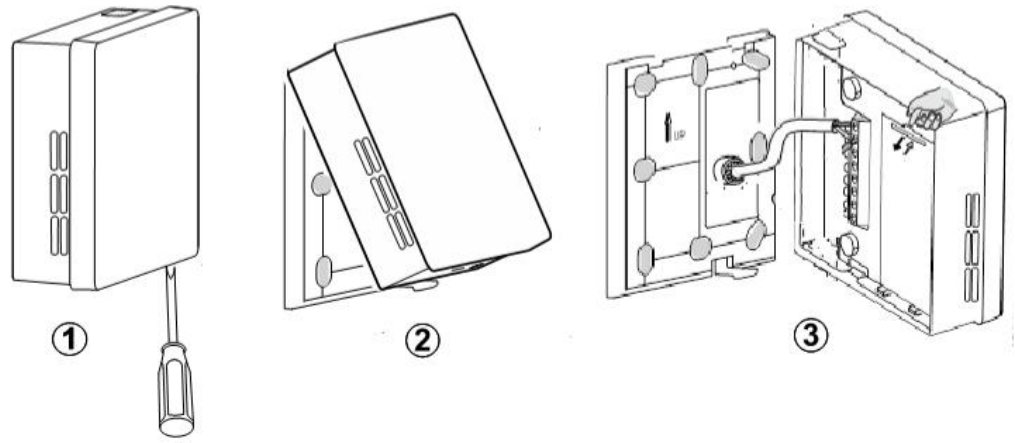
When is there a need to change the sensor module?

The sensor delivers signals:

	QSA2700 (with LED, without display)	**QSA2700D (with display)**
End of module's life	LED continuously red. Output transmits signal to the controller	Error info on the display. Output transmits signal to the controller
Inaccurate measure-ment caused by long-time exposure to high PM2.5 concentrations (e.g. in a smoking room)	LED flashes red 0.5 s/yellow 0.5 s, but sensor still works	Sensor continues to work, but a warning sign appears on the display

Who can exchange the sensor module?

Any person can exchange the sensor module. Open the device and replace the module as shown in the following illustrations. The exchange is as easy as exchanging a battery in a remote control.



What are the three classes which can be selected on the QSA.. fine dust sensor

The classes convert PM2.5 values differently to AQI levels. Our customers need to decide which class they want to apply for their region.

How do I select the class?

The class selection only applies to the QSA2700D for PM2.5 values.

	QSA2700 (with LED, no display)	QSA2700D (with display)
Initial setup	Not applicable	Using the button on the underside of the housing
Changing the settings	Not applicable	Using the button on the underside of the housing

With which Siemens products are fine dust sensors typically used?

The fine dust sensors are suited for use with all freely programmable Siemens controllers, such as those of the Desigo Room Automation and Climatix ranges.

Fine Dust – Marketing and Business Development

What is the competitive situation?

At the low-end, there are a number of consumer products for monitoring only. They are not designed to be connected to a building automation and control system. At the high-end, the company TSI specializes in particle measurement. Its sensors are certified and marketed at a significantly higher price than the Siemens sensors. Johnson Control sells brand-labeled TSI sensors – also at a very high price.

How do the Siemens QSA.. fine dust sensors differentiate against products of other manufacturers?

- Connection to Climatix via Modbus
- Powerbank for customer demonstration
- High-quality display

Which are the market segments for the fine dust sensors?

We see mainly office and high-end residential buildings.

Customers are typically found in large cities like Beijing, Mumbai, Paris or London, where people suffer from high levels of fine dust in special weather conditions.

How do I demonstrate the fine dust sensors?

The sensors can be powered with a powerbank via micro USB. Cigarettes or other smoke sources can be used to simulate polluted air.

How can I find out if my customer's city has a fine dust problem?

For real-time fine dust data for most parts of the world, go to http://aqicn.org/map/world/

How do the sensors connect to the respective controller?

The sensors feature two DC 0…10 V outputs for PM2.5 and PM10. These values are also made available via Modbus. Modbus integration supports the Climatix plug & play concept.

Which languages are supported?

English, German, French, and Chinese.