



KLOTZ®

Particle Measuring Systems for Air and Gases



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Particle Measuring System for Air and Gases

The cleanliness of air in the production process e.g. in electronically-, pharmaceutical-, and food industry is essential for the quality of the products.

Guidelines for testing clean rooms: VDI 2083, US Federal Standard 209 E, DIN EN ISO 14644, DIN 1946.



Various sensors measure particle sizes from 0.2 - 2000 μm



ABAKUS® MOBIL AIR

Particle counter for air and gases

The particle counter ABAKUS® mobil air is an evaluation system for the measurement of number and size of particles in air and in gaseous types of media. The measuring system is suitable for stationary as well as mobile applications. The variable equipment using four different particle sensors (LDS 228, LDS 328, LDS 328s or LDS 528) enables the particle counter to cover the measuring range from 0.2 μm to 50 μm , with the sensor LDS 2/2 5 μm to 500 μm , thus being suitable for a wide range of measuring tasks. The easy to use menu navigation ensures efficient working right from the outset. During the measurement the LCD display provides an overview of 16 particle size channels, date, time and the number of the current measurement. There is a tabular representation of the measuring results. At the end of a measurement the data can be printed out via a thermo printer. The software "Log and Show" allows further processing of the measured results on the PC in various programs (MS-Excel, Lotus 1-2-3 etc).

Direct measuring and filling is also possible via the software. The autocalibration function of the particle counter allows simple testing and secondary calibration of the system.

The particle counter ABAKUS® mobil air is available in two versions:

- mains-operated version 230V/AC
- version with rechargeable battery 24V/DC / power supply

Areas of application:

The monitoring and inspection of clean-rooms, clean workbenches, isolators, filter facilities in surgery rooms, compressed air, filling stations in the pharmaceutical industry, efficiency testing filters, measuring cleanliness of surfaces, etc.



Accessories



24 V/DC rechargeable battery



Flat nozzle



Hand start/stop



Surface nozzle



ABAKUS[®] mobil air with 8-fold measuring point toggle (on request)



CF card memory



Option: Wall holder for PCSS air



Nozzles: C°, %rF, m/s pressure differential



Sensor with air purge for dust measurements and filter test stands



External sensors for the measuring range 5-500 µm



Particle counter for compressed air

PCSS AIR

Particle counter with 2 channels for monitoring air cleanliness

The PCSS is designed as two-channel particle counter and is used for the monitoring of two size classes. A mini control (SPS) allows controlling of measurements and reading of status information. The measuring result (number particles per channel) can be transmitted to a SPS, a central computer or an electronic logger for further processing.

Since the PCSS can only make time-driven measurements, it is important that there is a controlled flow through the sensor. The PCSS air has a 28.3 l/min. built-in pump. The parameters for flush, measuring and interval time can be set individually for a measurement cycle. During the interval phase the laser of the sensor is switched off in order to boost service life. Each analogue output of the two channels can be allocated a target value and/or maximum value (particle number) (e.g. 20 mA = 2000 particles). The measured number of particles per channel is proportional to current (4-20 mA).

For permanent monitoring of the sensor its laser current and the function of the electronics is evaluated by the on-board diagnosis and in the event of fault the current signals of both channels are set to "zero" → 0 mA.

Areas of Application:

Online monitoring of isolators and laminar flows for the manufacturing of active agents.

TCC-PSS AIR

Particle counter with 3 channels for monitoring air cleanliness

The particle counter TCC-PSS air is a monitoring system for online measurement of the number and size of particles in the air. The measuring system is suitable for stationary use and covers with its various sensors a measuring range of 0.2 µm up to 500 µm. Depending on the sensor in use, the TCC can monitor within this range three freely selectable size classes and transmit the particle number either as analogue signal (current e.g. 4-20 mA) to a SPS or to the RS232. For each channel it is possible to set threshold values which monitor the degree of contamination and release an alarm signal if required. The measuring mode of the TCC is for time-driven measurements only which means that the rate of flow through the laser sensor must be kept constant (flow controller or similar). In connection with the PSS air box the air is drawn in by a piston pump through the measuring sensor. For compressed air and gases a pressure reducer is used.

Areas of application:

Monitoring of air cleanliness in hospitals, pharmaceuticals, cosmetics and food-stuff industry, where there are stringent requirements for the ambient air and air conditioning. Use in the semi-conductor industry, printed circuit board manufacturing and micro-mechanical production, in the automobile industry, in safety engineering and in nano technology. For monitoring flush processes in pipelines and containers as well as compressed air and pressure gas.

Accessories:

Measuring software SW-TCC
Parameter software SW-Para



IMPAKTOR FH5

Universal air sampler for control of microbiological air quality

The air sampler is a measuring instrument for testing the bioburden of the air, which can be used for both the impaction method as well as the filtration method. During the measuring procedure the air is drawn in by a radial fan specifically developed for the FH5 and the flow is automatically kept constant (impeller anemometer). The electronics control the measurement cycle. The sample volume selected via menu key flows in a defined measuring time through the filter attachment or via the Petri dish with the culture medium.

In the event of insufficient air flow the device switches off and the display shows *Düse zu* (nozzle blocked) or *Filter verblockt* (filter blocked) with the filtration method. In addition, the failure triggers a triple audio signal. In the event of too high air flow rate (device open, no nozzle inserted, filter torn, no filter inserted) the device switches off likewise and the message *Schlitz offen* (slot open) or *Filter defekt* (filter defect) is displayed.

A fully charged battery allows at least 90 consecutive measurements of 5 min. each.

Areas of application:

Hospitals, pharmaceutical, cosmetics and foodstuff industry. Here there are stringent requirements for the bioburden of the ambient air and air conditioning. Bioburden emissions of waste sites, sewage plants and irrigation fields are increasingly attracting attention.



ATM 225

Aerosol Generator ATM 225

The aerosol generator ATM 225 is used for generating test aerosols with defined properties. The number concentration of the aerosol particles can be set. From the determined concentration distributions of the produced DEHS aerosol it becomes evident that in the range of expected MPPS (Most Penetration Particle 0.2-0.3 µm) a very high particle concentration is provided (> 10⁷ particles/cm³). In the measuring range of many optical particle counters (> 0.3-0.5 µm) a particle number (0.5 x 10⁶ l particles/cm³) is generated in line with the requirements. The design and technological features of the device ensure a high stability of particle size distribution and particle concentration. The generated aerosol is thus very well reproducible.

The dimensions as well as low weight are ideal for mobile and flexible use. The core of the ATM 225 is an innovative atomizer completely made of stainless steel. It is a dual fabric nozzle working according to the injector principle, which is connected to an impact trap. It ensures that large droplets generated during the atomizing process are immediately returned and basically defines the generated particle size distribution. The compressed air required for atomizing is generated by a noiseless piston compressor. Before entering the atomizer the generated compressed air is cleaned by a HEPA filter. The standard volume flow is set at 250 l/h.

Areas of application:

An essential area of application of the aerosol generator ATM 225 is the testing of high efficiency filters or the acceptance and control measurements of clean rooms, laminar flow boxes and safety workbenches.



VS 100

Dilution system VS 100

The dilution system VS 100 is for the defined dilution of aerosols and thus provides the possibility to conduct particle measurements even in the case of very high particle concentrations. This is done by splitting the sample volume flow into 2 partial flows whereby 99% of the actual sample volume flow is directed through a HEPA filter that absorbs virtually all particles contained in the aerosol. This means that only 0.0283 l/min. or 0.01 CFM of the sample volume is fed unfiltered to the particle counter resulting in a dilution ratio of 1:100.

Areas of application:

Adjustment of the aerosol generator to a defined particle concentration. Measurement of heavily contaminated rooms and environments.



Particle Measuring Systems

Technical Details



ABAKUS® MOBIL AIR

(Ama 2 28 / Ama 3 28 / Ama 5 28)

Method	light scattering 90°
Particle size channel	sizes freely selectable e.g. in the range 0.5-20 µm / 0.3-10 µm / 0.2-5 µm max. 16 channels
Volume flow	28.3 l/min. / optional 2.8 l/min. with flush air controlled electronically
Data contents	date, time measuring volume particle number cleanroom class
Value readout	display built-in printer PC software LAS 31 RS232 threshold overstepping
Value memory	2.400 records / + CF card
Supply unit	230 V/AC/ battery 24 V/DC
Dimensions (h x w x d)/ weight/ material	Ama LDS 328 battery 200 x 360 x 190 mm, 7kg aluminum Ama LDS 228 / Ama LDS 328 / Ama LDS 528 200 x 360 x 260 mm 10 kg aluminum / 13 kg stainless steel

PCSS AIR

Method	light scattering 90°
Particle size channel	sizes freely selectable 0.5-5 µm max. 2 channels
Volume flow	28.3 l/min. monitored
Data contents	measuring status alarm message particle number
Value readout	current 4-20 mA threshold overstepping optional
Value memory	none
Supply unit	230 V/AC power supply / 24 V/DC
Dimensions (h x w x d)/ weight/ material	150 x 270 x 220 mm 5 kg stainless steel

TCC-PSS AIR

Method	light scattering 90°
Particle size channel	sizes freely selectable 0.3-0.5-5 µm max. 3 channels
Volume flow	28.3 l/min. monitored
Data contents	date, time measuring volume particle number with software SW-TCC air
Value readout	display current 4-20 mA RS232 threshold overstepping
Value memory	none
Supply unit	230 V/AC power supply / 24 V/DC
Dimensions (h x w x d)/ weight/ material	TCC 185 x 245 x 120 mm 1.5 kg plastic PCSS air 150 x 270 x 220 mm 5 kg stainless steel

Particle Measuring Systems

Technical Details



	AIR SAMPLER FH5	AEROSOL GENERATOR ATM 225	DILUTION LEVEL VS 100
Method	impaction/filtration	atomizer	bypass
Measuring range	25-1 000 l		dilution 1:100
Volume flow	100 l/min. impaction method 30 l/min. filtration method electronically controlled	250 l/h	28.3 l/min
Particle materials	(number of germs on the Petri dish or on the gelatin filter manually counted after treatment)	DEHS, DOP, paraffin Emery 3004 Latex suspensions Specification / DEHS > 10 ⁶ particles/cm ³ 0.2 µm / 2 x 10 ⁷ Part./cm ³ 0.5 µm / 5 x 10 ⁵ Part./cm ³ 1 µm / 1 x 10 ⁵ Part./cm ³ modal value 0.25 µm sample flow 2.5 g/h	
Operating time	7 h battery operation	80 ml fill: approx. 25 h	
Power supply	16.8 V/charge time 4.5 h / 450 mA	12 V/DC power supply	9 V/DC block battery/PP3
Dimensions (h x w x d)/ weight/ material	250 x 150 x 150 mm 3 kg aluminum / titan	220 x 300 x 180 mm 4.5 kg aluminum	190 x 330 x 120 mm 3.5 kg stainless steel



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