

# Particle Measuring Systems Technical Details



## ABAKUS MOBIL AIR (Ama 5 28 / Ama 3 28 / Ama 2 28 / Ama 1 28)

<b>Method</b>	light scattering 90°
<b>Particle size channel</b>	sizes freely selectable e.g. in the range 0.5-20 µm / 0.3-10 µm / 0.2-5 µm / 0.1-2 µm max. 16 channels
<b>Volume flow</b>	28.3 l/min. / optional 2.8 l/min. with flush air controlled electronically
<b>Data contents</b>	date, time measuring volume particle number cleanroom class
<b>Value readout</b>	display built-in printer PC software LAS 31 RS232 threshold overstepping
<b>Value memory</b>	2.400 records / + CF card
<b>Supply unit</b>	230 V/AC/ battery 24 V/DC
<b>Dimensions (h x w x d)/ weight/ material</b>	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  Ama LHS 128 / Ama LHS 228 200 x 360 x 445 mm, 16,5 kg stainless steel

## PCSS AIR

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

## TCC-PSS AIR

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

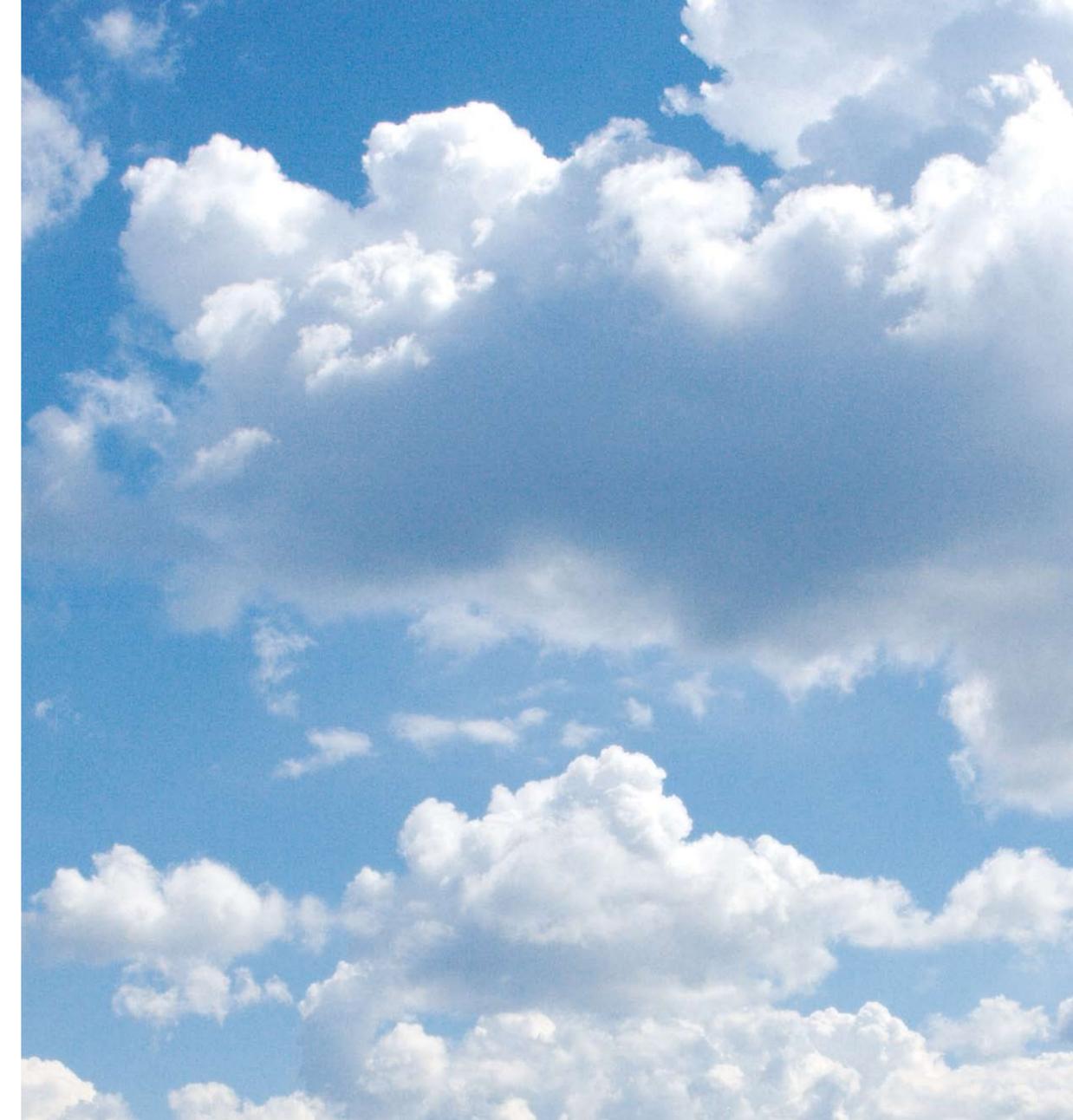
<b>Method</b>	impaction/filtration
<b>Measuring range</b>	25-1 000 l
<b>Volume flow</b>	100 l/min. impaction method 30 l/min. filtration method electronically controlled
<b>Particle materials</b>	(number of germs on the Petri dish or on the gelatin filter manually counted after treatment)
<b>Operating time</b>	7 h battery operation
<b>Power supply</b>	16.8 V/charge time 4.5 h / 450 mA
<b>Dimensions (h x w x d)/ weight/ material</b>	250 x 150 x 150 mm 3 kg aluminum / titan

## AEROSOL GENERATOR ATM 225

<b>Method</b>	atomizer
<b>Volume flow</b>	250 l/h
<b>Particle materials</b>	DEHS, DOP, paraffin Emery 3004 Latex suspensions  Specification / DEHS > 10 <sup>8</sup> particles/cm <sup>3</sup> 0,2 µm / 2 x 10 <sup>7</sup> Part./cm <sup>3</sup> 0,5 µm / 5 x 10 <sup>5</sup> Part./cm <sup>3</sup> 1 µm / 1 x 10 <sup>5</sup> Part./cm <sup>3</sup> modal value 0,25 µm sample flow 2,5 g/h
<b>Operating time</b>	80 ml fill: approx. 25 h
<b>Power supply</b>	12 V/DC power supply
<b>Dimensions (h x w x d)/ weight/ material</b>	220 x 300 x 180 mm 4,5 kg aluminum

## DILUTION LEVEL VS 100

<b>Method</b>	bypass
<b>Volume flow</b>	28.3 l/min
<b>Particle materials</b>	
<b>Operating time</b>	
<b>Power supply</b>	9 V/DC block battery/PP3
<b>Dimensions (h x w x d)/ weight/ material</b>	190 x 330 x 120 mm 3,5 kg stainless steel



## Particle Measuring Systems for Air and Gases



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Mobile particle counter Abakus mobil air, stationary particle counter TCC-PSS air, PCSS air, air sampler FH5, aerosol generator ATM 225, dilution system VS 100

# Particle Measuring System for Air and Gases

Clean room technology cannot manage without particle measurement technology for monitoring facilities. On the one hand a multitude of contamination sensitive technologies in the electronics industry, in the pharmaceutical industry, in the medical sector, in research and development as well as to an increasing extent in areas of the manufacturing industry have to meet the stringent requirements of manufacturing under clean conditions. On the other hand security aspects in pharmaceuticals and medicine are of great importance, e.g. the manufacturing and handling of Cytostatica.

For all these areas of application measurements with air particle counters are an essential part of the quality assurance measures for testing the sound condition of filters. Mandatory directives for the inspection of clean areas include: VDI 2083, US Federal Standard 209 E, DIN EN ISO 14644, DIN 1946, DIN 12950 / 12980 as well as the FDA and GMP guidelines.



## 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 (LHS 128, LHS 228, LDS 328, LDS 328s or LDS 528) enables the particle counter to cover the measuring range from 0.1 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 filing 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.

Various sensors measure particle sizes from 0.1-2000 µm



## Accessories



24 V/DC rechargeable battery



Flat nozzle



Hand start/stop



Surface nozzle



Abakus mobil air with 8-fold measuring point toggle



CF card memory



Network box for humidity and temperature sensors



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



Option: Wall holder for PCSS air



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.

**Recommended loggers:**  
 Jumo Logscreen es  
 Jokogawa DAQSTATION



## 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.

