



Aerosol generator ATM 240/S for aerosol generation from solutions with implemented aerosol drying technology.

The aerosol generator ATM 240/S was developed to produce aerosols from suspensions (e.g. salt solutions, sugar solutions) with high quantities of particles $> 1 \mu\text{m}$.

By operating the generator with aqueous potassium chloride suspensions ($\geq 5 \text{ wt.-%}$), solid aerosols are formed that fulfil the requirements of ISO 16890-2 at moderate test flow rates up to $64 \text{ m}^3/\text{h}$.

Applications

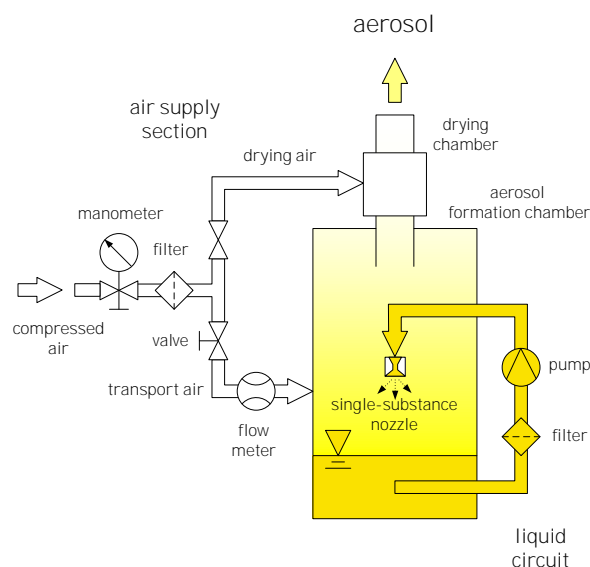
- fractional air filter separation efficiency testing according to ISO 16890-2
- calibration and validation of aerosol-analytical instruments
- medical research on coarse saliva aerosols (mass median aerodynamic diameter MMAD up to $8 \mu\text{m}$)

Features

- stable aerosol generation over time according to VDI 3491-2
- aerosols with high particle number concentrations in the size range of $0.01 - 10 \mu\text{m}$
- compact, space-saving design with implemented aerosol dryer
- fast operational readiness (short initial phase, easy to clean and maintain)

Principle of operation

The aqueous suspension to be aerosolised (aerosol substance) is dispersed by a one-substance nozzle within the aerosol formation chamber of the ATM 240/S.



Principle of aerosol generation: primary aerosol generation via one-substance nozzle and subsequent aerosol drying.

The supplied liquid flow disintegrates and forms a broad distributed (polydisperse) droplet aerosol (primary aerosol).



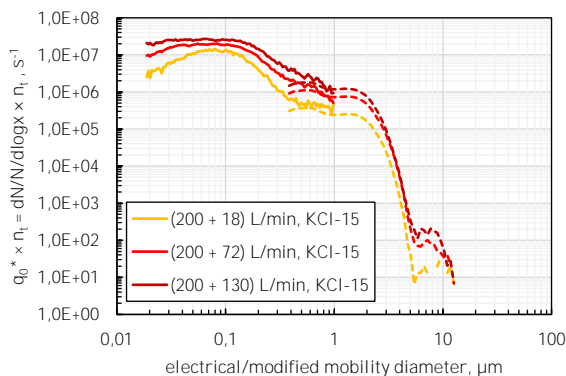
Specifications

Due to inertia and gravitational settling, too large droplets leave immediately the primary aerosol after generation. A dry purge air flow, which is fed into the aerosol formation chamber, transports the remaining airborne droplets into the dip tube and initiates contemporaneous the process of droplet drying. To ensure a drying stable test aerosol, the aerosol passes prior leaving the generator an implemented drying section.

Details

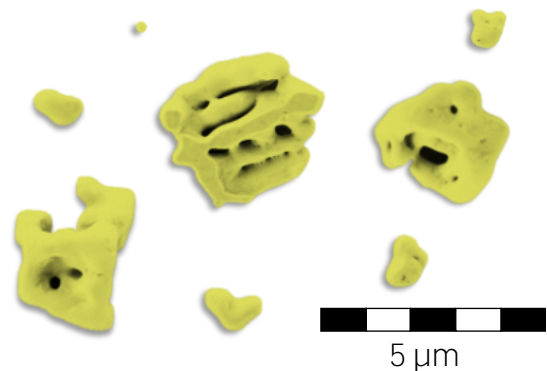
The particle concentration at the outlet of the generator is adjusted by the purging/transport flow that can be varied between 18 and 130 l/h.

The effect of the purging/transport flow on the particle size distribution is shown in following figure on the example of generator operation with an aqueous 15 wt.-% potassium chloride solution.



Particle size distributions of generated potassium chloride aerosols (combination of analytical methods: solid line = differential electrical mobility analyses; dashed lines = time of flight spectrometry; effective potassium chloride particle density of 1,98 g/cm³ used for transformation of intrinsically measured equivalent particle diameters)

The following figure shows typical form and surface characteristics of the generated potassium chloride particles



Morphology and topography of generated potassium chloride aerosol particles (scanning electron microscopy: 10.000-fold magnification)

Accessories (optional)

- electrical aerosol neutralisation system (EAN 581) for particle discharge
- laser aerosol spectrometer (e.g.: LAP 322, LAP 323, LAP 340) for determination of particle size and concentration

Technical specifications

air flow rate		
- total	218 ... 330 l/h	(variable)
- for transportation	18 ... 130 l/h	(variable)
- for drying	200 l/h	(static)
particle production rate	* for 15 wt.-% KCl solution	
- submicron (< 1 µm)	9,8 · 10 ⁶ ... 2,8 · 10 ⁷ s ⁻¹	
- micron (1 µm - 20 µm)	1,3 · 10 ⁵ ... 6,2 · 10 ⁵ s ⁻¹	
aerosol substances	solution of potassium chloride, sodium chloride,...	
particle size range	0.01 – 10 µm (KCl)	
substance capacity	100 ... 300 ml	
aerosol outlet diameter	Ø 13 mm (inner diameter)	
power supply	110 ... 230 VAC, 50/60 Hz 24 VDC, 2 A	
compressed air supply	5 bar, 0,5 m ³ /h, free of oil, dry	
dimension (w × h × d)	900 × 400 × 300 mm	
weight	25,0 kg	
Normative references	VDI 3491-2, ISO 16890-2	

© Copyright 2021 Topas GmbH. Specifications are subject to change without notice.

QMS certified according to DIN EN ISO 9001.



12 100 11908 TMS

Topas GmbH
Technologie-orientierte
Partikel-, Analysen- und Sensortechnik
straße 47 · D-01237 Dresden, GERMANY

Telefon +49 (351) 21 66 43 - 0
Fax +49 (351) 21 66 43 55
E-Mail office@topas-gmbh.de
Internet www.topas-gmbh.de

TOPAS-GMBH DE

PARTICLE UNDER CONTROL