

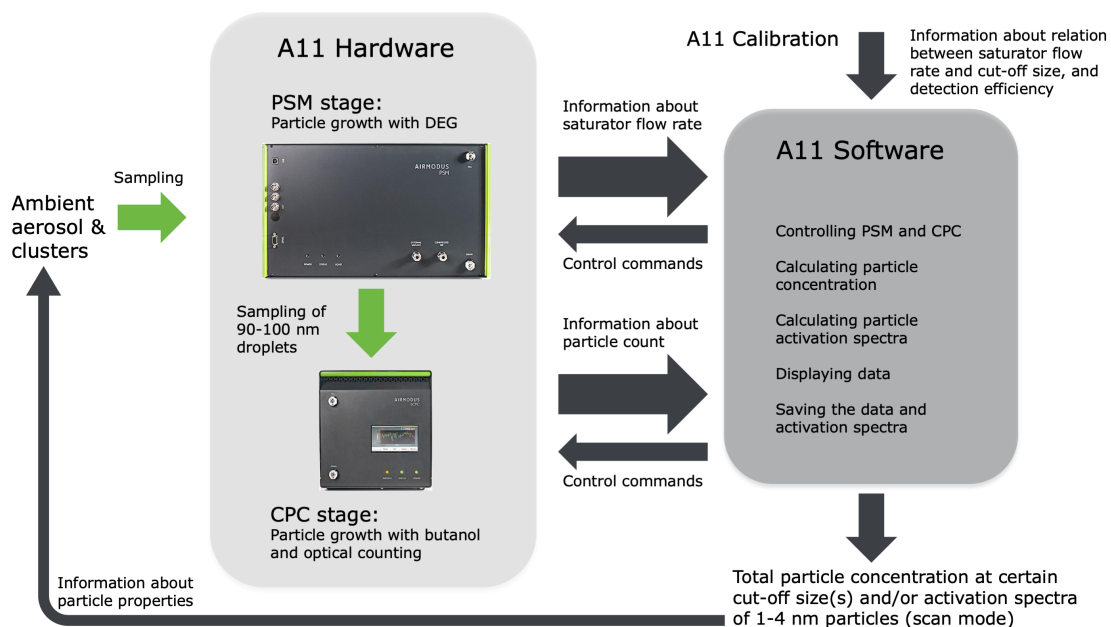
A11 nCNC System

www.airmodus.com

Study and monitor particles smaller than the detection threshold of any CPC. **Airmodus A11 Nano Condensation Nucleus Counter system** (nCNC) measures particles as small as 1 nm in diameter. It is a complete system consisting of a particle size magnifier (PSM), a condensation particle counter (CPC) and operation software. Airmodus A11 can be used to measure the total number concentration of sub-micron particles, or to learn about characteristics and dynamics of the 1-4 nm particles in real time.



A11 nano Condensation Nucleus Counter system



Benefits of the A11

- Detect particles as small as 1 nm in diameter in real time
- Also the electrically neutral particles
- Study the formation and growth of 1-4 nm particles
- Activation spectrum can be used for size or composition information.
- Data inversion in real time

Three operation modes

- Fixed mode: One fixed cut-off* for monitoring the appearance of nanoparticles.
- Stepping mode: Steps through several user-defined cut-offs*. Use to observe pre-defined size classes.
- Scanning mode: The activation spectrum of 1 – 4 nm* particles in less than 5 minutes

A11 nCNC Specifications

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Measurement range	1 - 1000 nm. 50% cut-off selectable: 1.3 – 3.5 nm*	Communication	Airmodus A10 PSM: <i>Serial:</i> RS-232 <i>USB:</i> type B connector <i>Analog out:</i> BNC connector 0 to 10 V for external devices, e.g. controlling of a DMA or ion filter.
Concentration	Calibrated: 0 – 100 000 #/cm ³ We recommend using in single particle counting mode: Up to 30 000 #/cm ³ in single particle counting mode with coincidence <10%; higher concentrations with Total Scattering Mode Correction		Airmodus A20 CPC: <i>Analog in:</i> BNC connector, 0 to 10 V (reading data of external sensor) <i>Analog out:</i> BNC connector 0 to 10 V, user-selectable function output (linear concentration, also DMA voltage control) <i>Pulse out:</i> BNC connector <i>Serial:</i> RS-232 <i>Ethernet:</i> RJ45 <i>USB:</i> type B connector
Aerosol sample flow	2.5 lpm (sample flow to CPC 1 lpm)		
Response time	$t_{95} < 2 \text{ s}^{**}$		
Working fluid	Diethylene Glycol (>99%) n-Butanol (>99%)		
Sample conditions	Pressure: 90 to 105 kPa Relative humidity: 0 to 95% non-condensing***		Both instruments: All communication based on ASCII character-encoding scheme.
Environmental conditions	Temperature: 15°C to 30°C Pressure: 90 to 105 kPa Relative humidity: 0 to 95% non-condensing	Power requirements	Both instruments (PSM and CPC) use an external power adaptor each (provided with the instruments):
Shipping conditions	Temperature: 0 - 40°C Relative humidity: <95% non-condensing The instrument should be shipped dry, in upright position and should be protected against tremor and blows.		Airmodus A10 PSM: Power adaptor input: 100 - 240 VAC 50/60 Hz max. 280 W Power adaptor output: 12VDC 21 A
External vacuum requirement	100 - 350 mbar pressure at NTP		Airmodus A20 CPC: Power adaptor input: 100 - 240 VAC 50/60 Hz max. 160 W Power adaptor output: 12VDC 11.5 A
External compressed air requirement	1.5 - 2.5 bar at NTP The air should be free of particles, oil and water (dew point below 0°C); maximum operating pressure is 3.0 bar at NTP.		
Fittings	Airmodus A10 PSM: <i>External vacuum:</i> fitting for 1/4 in. tubing <i>External compressed air:</i> fitting for 1/4 in. tubing <i>Inlet:</i> 1/4 in. stainless steel tube <i>Outlet:</i> 1/4 in. stainless steel tube Airmodus A20 CPC: <i>External vacuum:</i> 1/4 in. stainless steel tube <i>Inlet:</i> 1/4 in. stainless steel tube	Software	Airmodus A1X software for online data inversion and data acquisition (for Microsoft Windows, 7 or newer)
		Dimensions and weight	Airmodus A10 PSM: 290 x 450 x 465 (h x w x l in mm) 17.0 kg Airmodus A20 CPC: 260 x 230 x 400 (h x w x l in mm) 10.5 kg

*) Nickel Chromium equivalent activation diameter. See calibration certificate.

Note: When delivered as part of an A11 nCNC system, the A20 CPC is delivered with a cut-off of about 10 nm (see calibration certificate).
On request the A20 CPC cut-off can be set in calibration to be in the range 5 – 10 nm.

***) Enroth et al. 2018. <https://doi.org/10.1080/02786826.2018.1460458>

****) Above 40% please dry the sample to avoid excess water condensation inside the instruments
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