

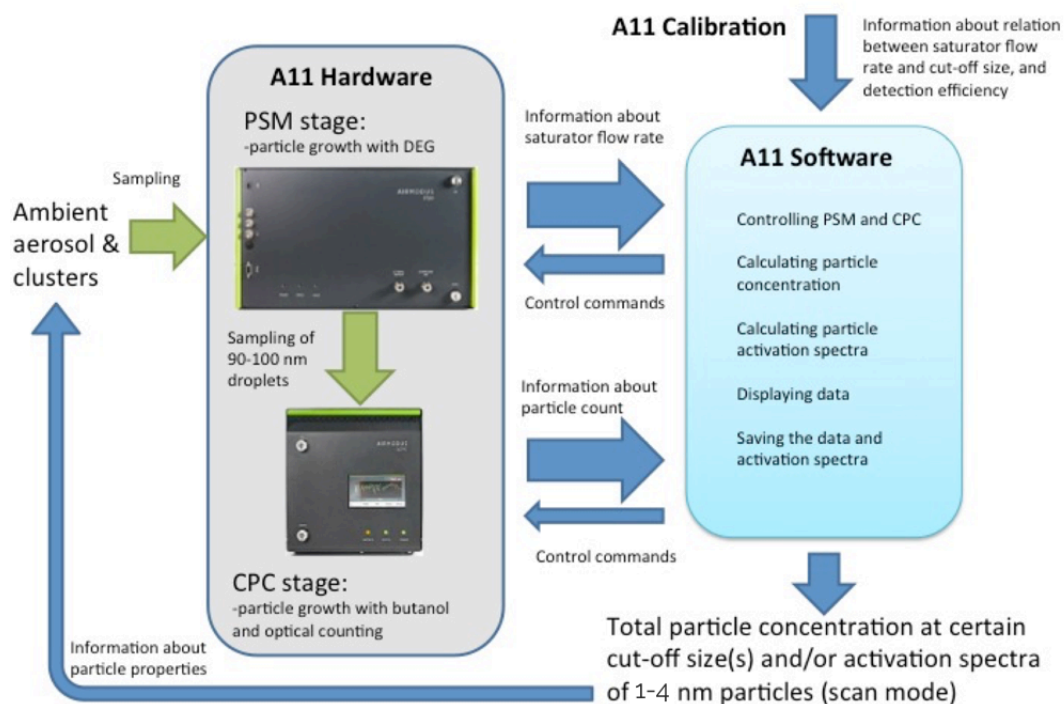
A11 nCNC System

www.airmodus.com

Study and monitor particles smaller than the detection threshold of any CPC. **Airmodus A11 Nano Condensation Nucleus Counter system** measures particles as small as 1 nm in diameter. It is a complete system consisting of a particle size magnifier, a particle counter 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: <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. AirmodusA20: <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 Both instruments: All communication based on ASCII character-encoding scheme.
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		
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***	Fittings	Airmodus A10: <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: <i>External vacuum:</i> 1/4 in. stainless steel tube <i>Inlet:</i> 1/4 in. stainless steel tube
Environmental conditions	Temperature: 15°C to 30°C Pressure: 90 to 105 kPa Relative humidity: 0 to 95% non-condensing		
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.	Software	Airmodus A1X software for online data inversion and data acquisition (for Microsoft Windows, 7 or newer)
External vacuum requirement	100 - 350 mbar pressure at NTP	Dimensions and weight	Airmodus A10: 290 x 450 x 465 (h x w x l in mm) 17.0 kg Airmodus A20: 260 x 230 x 400 (h x w x l in mm) 10.5 kg
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.		
Power requirements	For both instruments: 100 - 240 VAC max. 320 W universal AC input/full range		

*) 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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