

A11 nano Condensation Nucleus Counter (nCNC)

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.



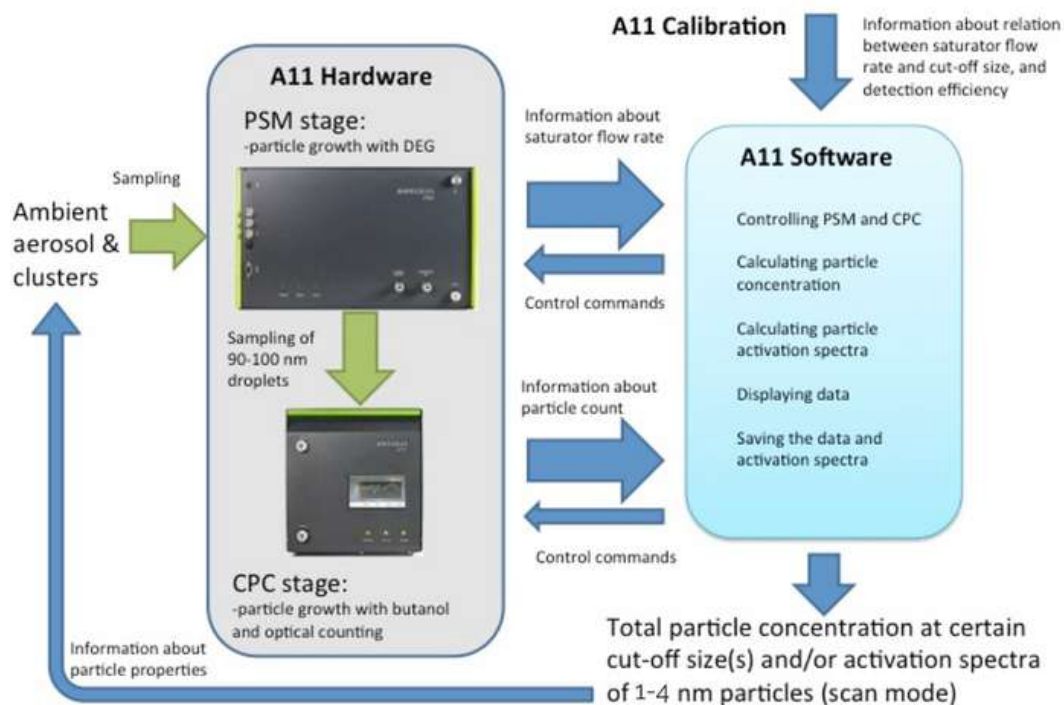
BENEFITS

- 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 Nano Condensation Nucleus Counter system



Specifications

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	Fittings	Airmodus A10: <i>External vacuum:</i> fitting for ¼ in. tubing <i>External compressed air:</i> fitting for ¼ 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
Aerosol sample flow	2.5 lpm (sample flow to CPC 1 lpm)	Software	Airmodus A1X software for online data inversion and data acquisition (for Microsoft Windows, 7 or newer)
Response time	t ₉₅ < 2 s**	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
Working fluid	Diethylene Glycol (>99%) n-Butanol (>99%)		
Sample conditions	Pressure: 90 to 105 kPa Relative humidity: 0 to 95% non-condensing***		
Environmental conditions	Temperature: 15oC to 30oC Pressure: 90 to 105 kPa Relative humidity: 0 to 95% non-condensing		
Shipping conditions	Temperature: 0 - 40oC Relative humidity: <95% non-condensing The instrument should be shipped dry, in upright position and should be protected against tremor and blows.		
External vacuum requirement	100 - 350 mbar pressure at NTP		
External compressed air requirement	1.5 - 2.5 bar at NTP The air should be free of particles, oil and water (dew point below 0oC); 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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