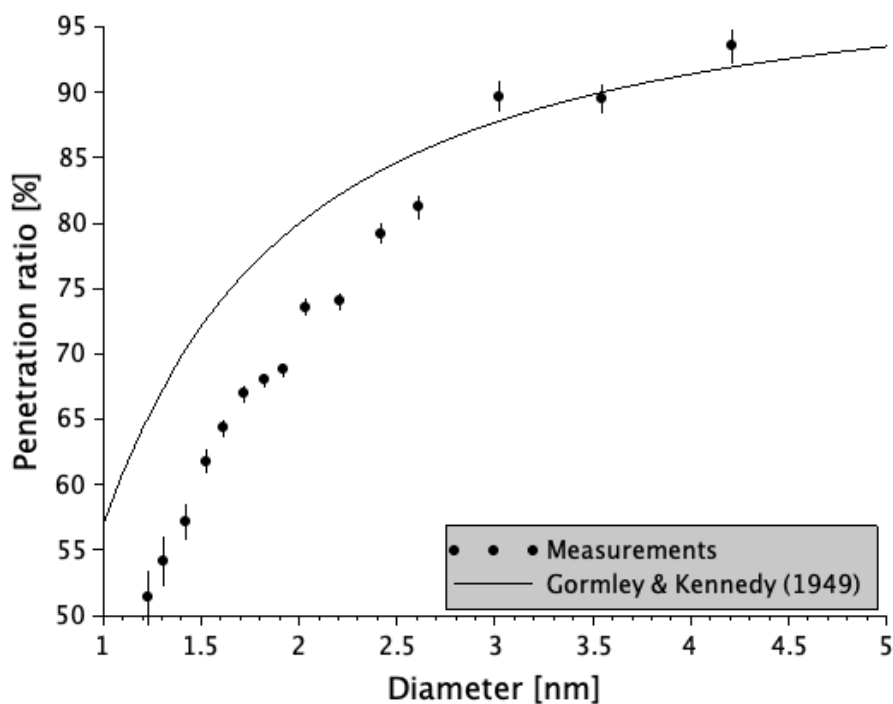


## Airmodus Nanoparticle Diluter (AND) prototype specifications

<b>Dilution ratio</b>	10
<b>Particle size range</b>	1 – 2 500 nm  Particle transmission efficiencies: >50% for 1.2 nm >75% for 2.0 nm >90% for 3.0 nm
<b>Inlet flow rate</b>	5.75 lpm $\pm$ 0.25 lpm depending on the particle detector inlet flow rate
<b>Instrument flow rate</b>	0.8 – 2.7 lpm can be used. AND measures the inlet flow rate of the particle counter when AND is initialized (either STATUS / INIT – button or via serial communication) with measurement accuracy of $\pm$ 1.5%. User can also measure the inlet flow rate and set the value through AND software.
<b>Instrument zero count measurement</b>	AND can measure the zero-count rate of the particle counter using HEPA filtered air. Zero mode can be started using serial command.
<b>Ion precipitator</b>	All the ions with electrical mobility diameter (singly charged) < 5nm can be removed (either ION PRECIPITATOR - button or via serial communication)
<b>Sample drying</b>	AND dries the sample down to relative humidity < 40% at all < 50°C and 99% RH sample conditions
<b>Sample RH%</b>	Range 0-99% (non-condensing); measurement accuracy of $\pm$ 1.5%. RH% of the diluted sample is calculated by the instrument automatically.
<b>Sample temperature</b>	From -20 to 50°C;  Measured with accuracy of $\pm$ 0.1°C. Temperature of the diluted sample is calculated by the instrument automatically.
<b>Sample pressure</b>	Range -10 to +5 kPa relative to environmental conditions around the instrument. Active pressure correction allows the usage with

	atmospheric pressures ranging from 0.5 to 1 atm.
	Pressure of the sample as well as the surroundings of the instrument are measured with accuracy of $\pm 1.5\%$ (of measurement value)
<b>External vacuum requirements</b>	100-350 mbar pressure at NPT
<b>External compressed air requirements</b>	1.0 – 3.0 bar at NTP. The air should be free of particles, oil and water (dew point below 0°C). Maximum operating pressure of 3.0 bar.
<b>Power requirements</b>	100-240 VAC Max 50W Normal power drain 30W Universal AC input/full range Instrument uses an external power adaptor (provided with the instrument)
<b>Communication</b>	USB (serial communication) Serial RS-232 (serial communication)
<b>Fittings</b>	<i>External vacuum:</i> fitting for 6 mm tubing <i>External compressed air:</i> fitting for 6 mm tubing <i>Inlet:</i> 10 mm stainless steel tube <i>Outlet:</i> 6 mm stainless steel tube or a Swagelok fitting for direct connection to Airmodus A10 PSM inlet.
<b>Dimensions and weight</b>	26 x 16 x 16 (h x w x l in mm) 26 x 25 x 25 (h x w x l in mm) with connectors 3.0 kg



**Figure 1.** Particle penetration measured using monodisperse NiCr-oxide (-) particles produced with a hot wire generator and size selected with the HalfMini DMA as well as calculated using the Gormley & Kennedy (1949) parametrization taking into account only the diffusional losses inside the AND.

**Table 1.** Ion precipitator efficiency measured using negatively charged monodisperse silver particles and Airmodus A11 nCNC as detector.

Dp [nm]	Precipitation efficiency [%]
4.0	99.84
5.0	99.83
6.0	96.85
7.0	77.95