

THE HIGH-ACCURACY COUNTER FOR NANOPARTICLES



CONDENSATION PARTICLE COUNTERS (CPCs) MODELS 5410 – 5421

With the new CPC line-up of models 5410 to 5421 GRIMM establishes a new standard for condensation particle counters. The new detection head enables single particle counting for concentrations up to 150 000 particles/cm³; moreover, it features an improved detection efficiency and response time. These new models are optimized for stationary use in any indoor or outdoor application.

All models feature the well established condensate removal pump and the anti-spill saturator design. In addition, a novel saturator shutter enables the transport of the CPC without the need of removing or drying the saturator.

We offer models with or without rugged internal pumps (the pumps fully meet the requirements of continuous long term measurements) and with or without built-in DMA controller. The photometric mode for high concentrations (up to 10⁷ P/ccm) may be integrated optionally in all models 5410 to 5421.

The CPCs can be combined with a GRIMM DMA for measurements of size distributions (see datasheet for the Scanning Mobility Particle Sizer, SMPS+C). Furthermore, a GRIMM Optical Particle Counter expands the SMPS+C system to a Wide Range Aerosol Spectrometer (WRAS) that measures size distributions up to a particle size of 32 µm.

The CPC line includes also 19" rack versions. GRIMM offers also mini-containers with additional meteorological sensors and online data transfer via mobile networks for unattended long term measurements at remote sites.



YOUR BENEFITS

- Six models optimized for laboratory and long-term use
- Improved detection limit with D50 = 4.0 nm for tungsten oxide particles
- Single particle counting up to 150 000 1/cm³
- Tolerates high ambient temperatures (40°C)
- Improved response time with T₉₀ < 3 seconds
- With preconfigured software on a mini-PC
- Analog inputs for additional sensors
- Comprehensive self-tests assure highest reliability

APPLICATIONS

- Fundamental aerosol research
- Filter testing
- Environmental & climatic studies
- Nanotechnology process monitoring
- Printer emission studies
- Inhalation & Exposure studies



CPC

SMPS+C

WRAS

CEN / TS
16967

REAL-TIME

TECHNICAL DATA

SPECIFICATIONS

	5410	5412	5416	5420	5421
	Standard CPC	Professional CPC with sample pump	Advanced CPC all inclusive	19" rack version	19" rack version counter only
Max. Conc. [1/ccm] Single count mode [1/ccm] Photometric mode	100 000 10 ⁷	100 000 10 ⁷	150 000 10 ⁷	150 000 10 ⁷	150 000 10 ⁷
Sample flow rate [l/min]	0.6	0.6	0.3	0.3	0.3
SMPS option	-	-	yes	yes	yes
Internal pump	-	yes	yes	yes	yes
Port for external sensors	-	-	yes	yes	yes
Size (h x w x d) [cm]	23 x 25 x 29	23 x 25 x 29	40 x 25 x 29	19", 22 x 48 x 41	19", 22 x 48 x 41

Particle Detection System

Particle Size Range	4.0 nm (D50 measured with tungsten oxide particles) to greater than 3 µm. Adjustable to 7.0 nm for compliance with the standard CEN 16967 for determination of the particle number concentration of atmospheric aerosols.
Particle Concentration Accuracy	5 % for single particle counting (up to 100 000 p/cm ³ at 0.6 l/min, up to 150 000 p/cm ³ at 0.3 l/min) 10 % for optional photometric mode (up to 10 ⁷ P/ccm at specified conditions)
Rise Time	T10-90 < 3 s

Air Flow System

Flow Rate Sample Air	0.6 l/min for counter models 5410 and 5412 0.3 l/min for counter models 5416, 5420, and 5421 as CPC or SMPS
Flow Rate Sheath Air	3.0 l/min
Flow Control	Critical orifice with stabilized temperature. Constant volume flow independent from ambient conditions.
Aerosol Carrier Gas	Air and inert gases
Working Fluid	Reagent-grade 1-butanol for activation of hydrophobic and hydrophilic particles
Condensate Removal	Continuous drain with micro-pump

FUNCTION

CPC Control	USB or serial
Data Recording	Directly on PC (GRIMM universal software 5477), optionally on USB stick
Status Indication	Display and 4 LEDs with 3 colors
Analog Inputs	Port for 3 optional analog climatic or gas sensors, plug and play

HANDLING

Ambient Temperature	10 to 40°C (50 to 104°F)
Ambient Humidity	0 to 95 % RH, non-condensing
Pressure	0 to - 200 mbar relative to ambient pressure
Power Requirements	85 - 264 VAC wide range power supply, 47 - 440 Hz, 80 – 130 W

This technical data may be subject to changed without notice.
 Datasheet_54xx_CPCs_ENG_V2p0.pdf