

SMPS+C 5420-TR-CEN 19" Scanning Mobility Particle Sizer with Condensation Particle Counter

Harmonized UFP measurements according to CEN/TS 17434

- Particle size range 10 ... 1,094 nm
- CPC calibrated according to prEN 16976
- Long term operation butanol tank unit
- Inlet system with Nafion® based dryer



FEATURES

- CEN/TS 17434 and prEN 16976 compliance
- Vienna Reischl Type DMA
- Compact 19" design
- Integrated pumps
- Long term butanol and condensate tanks
- Saturator shutter

TECHNICAL DATA

Measurement principle	Electrostatic classification in DMA and detection in a condensation particle counter
Measuring variable	Particle size distribution, $dN/d\log D$ ($1/\text{cm}^3$)
Particle size range	10 ... 1,094 nm (GRIMM L-DMA)
Particle size channels	<ul style="list-style-type: none"> • Stepping mode: 45 ... 255 • Scanning mode: 64 per decade • Logarithmic spacing
Maximum particle concentration	Up to 10^7 particles/ cm^3 *
Minimum scan time	150 s
Sample inlet pipe	<ul style="list-style-type: none"> • Nafion® based dryer • Drying of aerosol flow to $\leq 40\%$ RH • Maximum particle losses $\leq 25\%$ at 10 nm
Total inlet flow rate	1.8 l/min (through sample pipe)
CPC working fluid	n-butanol (n-butyl alcohol)
CPC counting efficiency	$D_{50} = 10 \pm 1$ nm $D_{90} \leq 20$ nm
CPC sample flow rate Q_s	0.6 l/min
DMA sheath flow rate Q_{sh}	3.0 l/min
Flow control	Critical orifices with stabilized temperature
DMA resolution	$Q_{sh}/Q_s = 5$
DMA sizing accuracy	$\leq 3\%$ of nominal diameter
DMA parameters	$R_i = 13$ mm; $R_o = 20$ mm $L = 350$ mm (GRMM L-DMA)
HV module	Integrated in DMA +5 ... +10,000 V (neg. polarity on request)

* Depending on used aerosol neutralizer

** Requires 19" rack rails

*** Outdoor installation requires weather protection shelter

BENEFITS

- Harmonized UFP counting
- Low particle losses, high size resolution
- Easy integration in measurement stations
- No external vacuum required
- Unattended 24/7 operation for 3 weeks
- Prompt transport without butanol drying

Standards and certificates	<ul style="list-style-type: none"> • ISO 15900:2009 • CEN/TS 17434:2020 • ISO 27891:2015 • prEN 16976:2023 • List of ACTRIS compliant instruments
Internal sensors	<ul style="list-style-type: none"> • T and RH in aerosol inlet and sheath air flow • T, p_{abs} and Δp across inlet in DMA • p_{abs} and Δp across inlet in CPC
Connectivity	USB, USB flash drive, RS-232, analog input for meteorological sensors, analog pulse output
Operation and display	<ul style="list-style-type: none"> • Status LEDs and LCD display on CPC • 15.6" touch sensitive monitor • GRIMM 5477 nanoSoftware for sizers on PC
Power requirements	110 ... 240 VAC; 50/60 Hz; maximum 130 W
Ambient aerosol conditions	<ul style="list-style-type: none"> • Temperature: $-20 \dots 40$ °C ($-4 \dots 104$ °F) • Humidity: 0 ... 95% RH, non-condensing • Absolute pressure range: 700 ... 1,100 mbar
Transport and storage	0 ... +50 °C (32 ... 122 °F), RH < 95%
Installation	<ul style="list-style-type: none"> • In 19" instrument rack** • Indoor or outdoor*** protected environment • Temperature: 20 ... 30 °C (68 ... 86 °F) • Humidity: 0 ... 95% RH, non-condensing
System components	<ul style="list-style-type: none"> • CPC 5420-TR-CEN • 5438-1.5: Butanol and condensate tank unit • 182-1.5: 1.5 m sample pipe • Measurement PC with 15.6" monitor
Dimensions (h x w x d)	<ul style="list-style-type: none"> • CPC: 22 x 48 x 41 cm (8.7 x 19 x 16 in.) 5 height units 19" • Monitor: 31 x 48 x 27 cm (12 x 19 x 10.6 in.) 7 height units 19" • Tank unit : 9 x 48 x 32 cm (3.5 x 19 x 12.6 in.) 2 height units 19" • Height with sample pipe: 213 cm (83.9 in.)
Weight	<ul style="list-style-type: none"> • CPC with L-DMA: 24.1 kg (53 lbs) • Monitor and PC: 6.6 kg (14.6 lbs) • Tank unit: 4.1 kg (9 lbs) • Total with sample pipe: 34.8 kg (83 lbs)

OPTIONAL ACCESSORIES

5523-Ni	Ni-63 (95 MBq) Aerosol Neutralizer
5525-X	Soft X-ray (< 4.99 keV) Aerosol Neutralizer
5540	Sheath air Dryer and Adsorber