

# GRIMM 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 ... 1,090 nm
- CPC calibrated according to EN 16976
- Long term operation butanol tank unit
- Inlet system with Nafion® based dryer



## FEATURES

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

## BENEFITS

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

## TECHNICAL DATA

<b>Measurement principle</b>	Electrostatic classification in DMA and detection in a condensation particle counter
<b>Measuring variable</b>	Particle size distribution, $dN/d\log D$ ( $1/\text{cm}^3$ )
<b>Particle size range</b>	10 ... 1,090 nm (GRIMM L-DMA)
<b>Particle size channels</b>	<ul style="list-style-type: none"> <li>• Stepping mode: 45 ... 255</li> <li>• Scanning mode: 64 or 128 per size decade</li> <li>• With logarithmic equidistant spacing</li> </ul>
<b>Maximum particle concentration</b>	Up to $10^7$ particles/ $\text{cm}^3$ *
<b>Minimum scan time</b>	150 s
<b>Sample inlet pipe</b>	<ul style="list-style-type: none"> <li>• Nafion® based dryer</li> <li>• Drying of aerosol flow to <math>\leq 40\%</math> RH</li> <li>• Maximum particle losses <math>\leq 25\%</math> at 10 nm</li> </ul>
<b>Total inlet flow rate</b>	1.8 l/min (through sample pipe)
<b>CPC working fluid</b>	n-butanol (n-butyl alcohol)
<b>CPC counting efficiency</b>	$D_{50} = 10 \pm 1$ nm $D_{90} \leq 20$ nm
<b>CPC sample flow rate <math>Q_s</math></b>	0.3 or 0.6 l/min
<b>DMA sheath flow rate <math>Q_{sh}</math></b>	3.0 l/min
<b>Flow control</b>	Critical orifices with stabilized temperature
<b>DMA resolution</b>	$Q_{sh}/Q_s = 5$ or $10$
<b>DMA sizing accuracy</b>	$\leq 3\%$ of nominal diameter
<b>HV module</b>	Integrated in DMA 0 ... +10,000 V (neg. polarity on request)

<b>Standards and certificates</b>	<ul style="list-style-type: none"> <li>• ISO 15900:2020</li> <li>• CEN/TS 17434:2020</li> <li>• ISO 27891:2015</li> <li>• EN 16976:2024</li> <li>• List of ACTRIS compliant instruments **</li> </ul>
<b>Internal sensors</b>	<ul style="list-style-type: none"> <li>• T and RH in aerosol inlet and sheath air flow</li> <li>• T, <math>p_{abs}</math> and <math>\Delta p</math> across inlet in DMA</li> <li>• <math>p_{abs}</math> and <math>\Delta p</math> across inlet in CPC</li> </ul>
<b>Connectivity</b>	USB, USB flash drive, RS-232, analog input for meteorological sensors, analog pulse output
<b>Operation and display</b>	<ul style="list-style-type: none"> <li>• Status LEDs and LCD display on CPC</li> <li>• 15.6" touch sensitive monitor</li> <li>• GRIMM 5477 nanoSoftware for sizers on PC</li> </ul>
<b>Power requirements</b>	110 ... 240 VAC; 50/60 Hz; maximum 130 W
<b>Ambient aerosol conditions</b>	<ul style="list-style-type: none"> <li>• Temperature: <math>-20</math> ... <math>40</math> °C (<math>-4</math> ... <math>104</math> °F)</li> <li>• Humidity: 0 ... 95% RH, non-condensing</li> <li>• Absolute pressure range: 700 ... 1,100 mbar</li> </ul>
<b>Transport and storage</b>	0 ... +50 °C (32 ... 122 °F), RH < 95%
<b>Installation</b>	<ul style="list-style-type: none"> <li>• In 19" instrument rack ***</li> <li>• Indoor or outdoor **** protected environment</li> <li>• Temperature: 20 ... 30 °C (68 ... 86 °F)</li> <li>• Humidity: 0 ... 95% RH, non-condensing</li> </ul>
<b>System components</b>	<ul style="list-style-type: none"> <li>• CPC 5420-TR-CEN</li> <li>• 5438-1.5: Butanol and condensate tank unit</li> <li>• 182-1.5: 1.5 m sample pipe</li> <li>• Measurement PC with 15.6" monitor</li> </ul>
<b>Dimensions (h x w x d)</b>	<ul style="list-style-type: none"> <li>• CPC: 22 x 48 x 41 cm (8.7 x 19 x 16 in.) 5 height units 19"</li> <li>• Monitor: 31 x 48 x 27 cm (12 x 19 x 10.6 in.) 7 height units 19"</li> <li>• Tank unit : 9 x 48 x 32 cm (3.5 x 19 x 12.6 in.) 2 height units 19"</li> <li>• Height with sample pipe: 213 cm (83.9 in.)</li> </ul>
<b>Weight</b>	<ul style="list-style-type: none"> <li>• CPC with L-DMA: 24.1 kg (53 lbs)</li> <li>• Monitor and PC: 6.6 kg (14.6 lbs)</li> <li>• Tank unit: 4.1 kg (9 lbs)</li> <li>• Total with sample pipe: 34.8 kg (83 lbs)</li> </ul>

- \* Depending on used aerosol neutralizer  
 \*\* 0.6 l/min sample flow rate version  
 \*\*\* Requires 19" rack rails  
 \*\*\*\* Outdoor installation requires weather protection shelter

## 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

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