DURAG GROUP

1371 MiniWRAS
Portable mini wide range aerosol spectrometer

For ultrafine particles and PM measurements

- Particle sizing and counting from 10 nm to 35 µm
- Two analyzers in one instrument
- No liquids or consumables

GRIMM AEROSOL TECHNIK
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FEATURES

- **Two analyzers in one instrument**
  Combination of optical (OPC) and electrical (nanosizer) particle detection
- **One combined data set**
  PM_{10}, $PM_{2.5}$, PM_1, inhalable, thoracic, and respirable particle number size distribution
- **41 equidistant size channels**
  From 10 nm to 35 µm
- **Intelligent Li-Ion battery**
  For portable use up to 10 hours
- **Flexible data acquisition and communication**
  With USB flash drive, Bluetooth and MiniWRAS software
- **Particle free rinsing air design**
  For improving detection and reducing signal noise

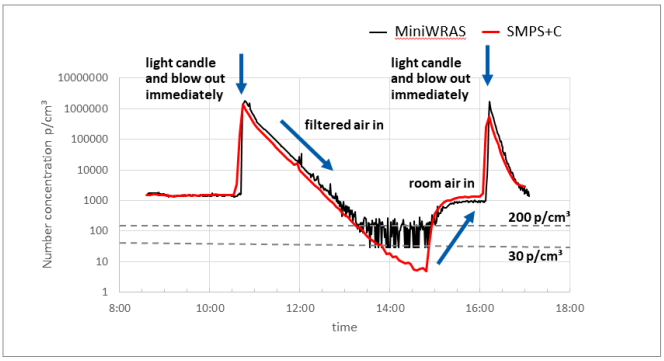
BENEFITS

- **Suitable for various applications**
  - Workplace monitoring for both ultrafine particles (UFP) and dust mass fractions
  - Nanoparticle source identification
  - Indoor air quality (IAQ)
  - R+D testing in industry
- **No consumables or liquids**
  Fully portable, operation irrespective of its position
- **No handling license required**
  Non-radioactive unipolar diffusion charging (DC)
- **Compact design**
  Allows easy integration in laboratory or mobile setups
- **Easy to use**
  - Status control via LEDs
  - Start/stop button for stand-alone operation

TECHNICAL DATA

Detection principle	• Diffusion Charging (DC), electrical mobility based sizing and detection in Faraday Cup Electrometer (FCE) • Optical particle counter and spectrometer (OPC) using light scattering at single particles with diode laser (optical)
Output	• PM_{10}, $PM_{2.5}$, PM_1 • Dust mass fractions as per EN 481: inhalable, thoracic, respirable • Particle number concentration and size distribution
Particle size range	10 nm ... 35.15 µm, 10 ... 193 nm (electrical), 0.253 ... 35.15 µm (optical)
Size channels	41 (10 electrical and 31 optical)
Particle number	200 ... 1,000,000 particles/cm³; depending on charging state (electrical) 0 ... 5,300,000 particles/l (optical)
Dust mass concentration	0 µg/m³ ... 100 mg/m³
Measurement uncertainty nanosizer	± 40% for number concentration and geometric mean diameter (electrical)
Counting efficiency OPC	98.2% for 0.3 µm, 99.5% for 0.5 µm, 91.8% for 1.0 µm, 91.0% for 5 µm, meets ISO 21501-1 (optical)
Time resolution	• 60 s for 10 channels, 6 s per channel sequentially, storage interval 1 min (electrical) • 6 s for 31 channels, storage interval 1 min (optical)

Sample flow rate	1.2 l/min ± 3%
Rinsing air (OPC)	0.4 l/min, particle free air; protects laser optics in OPC; reference air for self-test
Rinsing Air (FCE)	0.3 l/min dried, particle free air; minimizes noise level in FCE
Power supply	• In: 100 ... 240 VAC, 47 ... 63 Hz, • Out: 18 VDC, 2.5 A
Battery	Intelligent Li-Ion-battery, 14.4 V, 98 Wh, 6.8 Ah for minimum 10 h operation, recharging: 5 h with power supply
Connectivity	Bluetooth, RS-232, USB flashdrive, analog input for meteorological sensors
Operating conditions	+ 4 ... +40 °C (39 ... 104 °F), RH < 95%, non condensing, 533 ... 1133 mbar
Transport and storage	–20 ... +50 °C (–4 ... 122 °F) RH < 95%
Dimensions (L x W x H)	34 x 31 x 12 cm (13.4 x 12.2 x 4.7 inch)
Weight	8.2 kg (18 lbs)



Time trace of MiniWRAS total particle number concentration vs. GRIMM SMPS+C system in candle light experiment.

OPTIONAL ACCESSORIES

1152 Isokinetic sampling probe for 4 to 25 m/s
1158 TRH External sensor for temperature and relative humidity

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