DNP DIGITAL 3000

Particle measurement devices should be calibrated using particles with characteristics, e.g., shape, size, density, surface condition, and refractive index, similar to those of the actual aerosol to be tested, e.g., diesel soot.
The new DNP digital 3000 generates a condensation aerosol from monolithic graphite. The resulting carbon agglomerates are similar to diesel soot concerning particle size distribution.
Due to the new digital regulation, the generator enables an enhanced setting range and an even higher constancy of the generated particle size and concentration.
The particle measurement program (PMP) recommends that the particle size be adjusted to 30 nm, 50 nm, and 100 nm for calibration of the complete measurement chain. The 30 nm, 50 nm, and 100 nm particle fractions can be classified with a DEMC (differential electro-mobility classifier) based on the particle spectrum provided by the DNP digital 3000. The DNP digital 3000 can quickly, reliably, and reproducibly determine a particle measurement chain's transmission behavior/function, e.g., the PMP measurement chain and individual components at corresponding temperatures of up to 400 °C.
The DNP digital 3000 has mass flow controllers to control the volume flows for nitrogen and dilution air. The DNP digital 3000 is controlled using a built-in touch display.
The built-in touch display can adjust the DNP digital 3000 device parameters individually. For more effortless operation, saving parameter sets and retrieving them when restarting the device is possible. In addition, the REF 3000 reference exhaust can be controlled separately using the DNP digital 3000.
The DNP digital 3000 requires nitrogen or argon as the carrier gas. Nitrogen or argon causes virtually no change in the density of the exhaust gas being measured.
The carrier gas argon is mainly used in academic applications, e.g., to evaluate the effect of nanoparticles in inhalation or toxicology. In that field, Prof. Oberdörster from the University of Rochester Medical Center did a lot of academic research with the previous device, GFG 1000, and published many academic papers with different electroconductive electrodes.

Benefits

- Fast adjustable particle size distribution
- Very precise adjustment of volume flow via MassFlow-Controller
- Excellent short-term and long-term particle size and concentration constancy
- Particle structure similar to that of diesel soot at graphite electrodes
- Apart from graphite electrodes, copper, silver or other electroconductive electrodes can be used as well
- For PMP-measuring section easy connectable to CVS systems in combination with RAS 3000 (accessories)
- No volatile parts in the aerosol
- Aerosol is temperature-resistant to 400 °C
- AK interface protocol for Ethernet via UDP protocol
- Easy to operate by touch display
- Highest reproducibility by saving the operation settings

- Easy transport

- Reliable function
- Best reproducibility
- Low maintenance

Applications

- Calibration of PMP measurement chain
- Calibration of particle measurement devices

- Calibration of sampling lines
- Production of nano particles

- Inhalation exploration

- Toxicology

DATASHEET

Particle size range	0.02 – 0.35 μm	Volume flow	4 – 70 Nl/min
Volume flow (accessories)	0 – 450 l/min (REF 3000)	Volume flow (carrier/dispersion gas)	4 – 20 l/min
Volume flow (dilution gas)	0 – 50 l/min	Mass flow (particles)	0.1 – 25 mg/h (for carbon)
Particle material	Carbon, copper, silver, gold and other metals	Dosing time	Several hours nonstop
Pre-pressure	4 – 8 bar	Carrier/dispersion gas	Nitrogen, argon
Compressed air connection	Quick coupling	Aerosol outlet connection	$Ø_{inside}$ = 6 mm, $Ø_{outside}$ = 8 mm
Particle size range (primary particles)	3 – 10 nm	Dilution gas	Particle-free and dry compressed air
Dimensions	125 • 470 • 435 mm (H • W • D)	Weight	23 kg