Print View

RBG 1000

RBG 1000

Generation of test aerosols from powders, pollen, and biological agents, mass flow approx. 10 mg/h – 430 g/h

Version: April 26, 2017

RBG 1000

Model Variations

RBG 1000 D
Pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)

RBG 1000 G
For very low feed rates starting at 1 mm/h

RBG 1000 GD
For very low feed rates starting at 1 mm/h, pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)

RBG 1000 I
Separate dispersing unit and control unit

RBG 1000 ID
Separate dispersing unit and control unit, pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)

RBG 1000 ISD
Separate dispersing unit and control unit, pressure-resistant at over-pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure), nitrogen as dispersion gas as well

RBG 1000 L
Dispersing unit removable and weighable

RBG 1000 SD
Pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure), also nitrogen as a dispersing gas

Description

Low-concentration solid particle aerosols produced from powders are required for many applications in research, development, and quality assurance and for the calibration of particle measurement devices.

For more than 25 years, the RBG system has been used worldwide with great success for the reliable dispersion of non-cohesive powders such as mineral dusts, active pharmaceutical ingredients, pollen, etc. in the size range of < 100 µm and with a fine fraction of < 100 nm. Monolithic solid materials such as blackboard chalk are finely dispersed with highest dosing constancy.

The special advantage of this dosing and dispersion system is that in the case of the RBG 1000, mass flows ranging from approx. 10 mg/h up to approx. 430 g/h are dispersed with the highest level of dosing constancy thanks to quick, easy exchange of the solid material reservoir. The fill level of the feed stock reservoir is 70 mm.

Optional:

- **Pressure-resistant up to 3 bar**
- **New: Low pressure operation from 300 mbar (absolute pressure), operation with nitrogen**

Start-up

The powder to be dispersed is filled little by little into the cylindrical solid material reservoir and compressed with a tamper. In the context of the validation of the guideline "Prüfverfahren für mobile Raumluftreinigungsgeräte" at the Lucerne University of Applied Sciences and Arts an excellent reproducibility of the tamping density in the solid material reservoir was determined. The deviation of the tamping densities of five fillings was just 3.4 %.

The filled solid material reservoir is inserted into the dispersing head of the RGB, and the powder, which has thus been uniformly compressed across the filling level, is conveyed onto a rotating brush at a precisely controlled feed rate. An adjustable volume flow streams over the tightly woven precision brush at a very high speed and tears the particles out of the brush.

The entire material delivered can optionally be determined gravimetrically with the RBG 1000 L.

The dispersing head assembly comprises a dispersing head, dispersing cover, precision brush, and solid material reservoir.

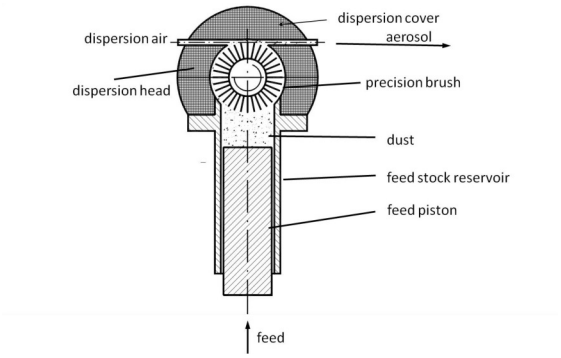

Fig. 1: Schematic diagram of RBG system

Dosing

Dosing is performed via the precisely controlled feed rate of the feed piston. The desired mass flows can be easily and reproducibly specified based on the cross section of the solid material reservoir, the precisely adjustable feed rate of the feed piston and the easy-to-determine tamping density of the powder in the reservoir.

RBG 1000				
Reservoir Ø	Fill quantity	Feed rate 1 mm/h	Feed rate 5 mm/h	Feed rate 700 mm/h
7 mm	2.7 g	38 mg/h	190 mg/h	27 g/h
10 mm	5.5 g	79 mg/h	395 mg/h	55 g/h
14 mm	10.8 g	154 mg/h	770 mg/h	107 g/h
20 mm	22 g	314 mg/h	1570 mg/h	219 g/h
28 mm	43 g	616 mg/h	3080 mg/h	430 g/h
RBG 2000				
16 mm	36 g	0.2 g/h	1 g/h	140 g/h
20 mm	56 g	0.3 g/h	1.5 g/h	220 g/h
28 mm	110 g	0.6 g/h	3 g/h	430 g/h
32 mm	144 g	0.8 g/h	4 g/h	562 g/h

Table 1: Mass flows of RBG system (compacted density 1 g/cm^3)

Dispersing

The powder separated from the reservoir by the precision brush is almost completely dispersed into the constituent particles, down to < 100 nm (see Fig. 2), in the dispersing head by the dispersing air flowing at high speed.

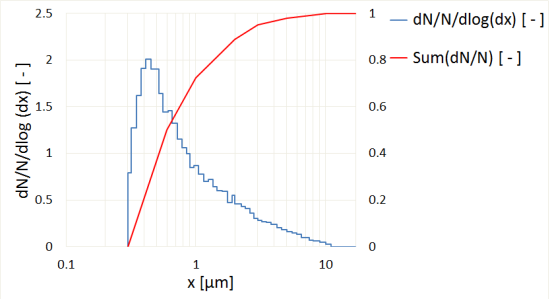

Fig. 2: Particle size distribution with the welas® digital 2000

Fig. 3: Dispersing covers, type A,. type B and type C

Four different dispersing covers can be used for optimal dispersion (see Fig. 3, additional details under "Accessories").

	Particle size	Reservoir Ø	Volume flows
Cover A	<0,1–100 µm	7-32 mm	2–5 m³/h
Cover B	<0,1–100 µm	7, 10 and 14 mm	1–2.5 m³/h
Cover C	<0.1–100 µm	7 mm	0.5–1.2 m³/h
Cover D	200–1000 µm	7-32 mm	2–5 m³/h

Table 2: Dispersion covers

	Feed rate mm/h	Reservoir Ø mm	Reservoir length mm
RBG 1000	700	7–28	70
RBG 1000 D	700	7–20	70
RBG 1000 G	300	7–28	70
RBG 1000 GD	300	7–20	70
RBG 1000 L	700	10, 14	70
RBG 1000 SD	700	7-20	70
RBG 1000 SG	300	7-20	70
RBG 1000 I	700	7-28	70
RBG 1000 ID	700	7-20	70
RBG 1000 ISD	700	7-20	70
RBG 2000	700	16 - 32	180
RBG 2000 D	700	16, 20, 28	180
RBG 2000 SD	700	16, 20, 28	180

Table 3: Different versions of the RBG system

I = version for inhalation D = pressure-resistant G = low feed rate L = easily removable and weighable dosing unit S = nitrogen version

Pulse mode

The construction design of the RBG system allows for operation in "powder"/"no powder" pulse mode with cycle lengths ranging down to a second. The function can be set manually via the "Stop/Start", and "Forward" keys or automatically via an electric timer switch.

All RBG versions can be optionally **controlled via remote control** or via computer.

RBG 1000

Benefits

- Highest short-term and long-term dosing constancy
- Disperses virtually all non-cohesive dusts
- Easy exchange of different solid material reservoirs and dispersing covers
- Easy determination and adjustment of the mass flow
- Pulse mode
- Device easy to clean
- Quick and easy to operate
- Reliable operation
- Little maintenance required
- Reduces your operating expenses

RBG 1000

Datasheet

Parameter	*Description*
Volume flow	0.5 – 5.0 m^3 /h
Power supply	115/230 V, 50 – 60 Hz
Dimensions	465 • 320 • 200 mm (H • W • D)
Weight	Approx. 19 kg
Particle material	Non-cohesive powders and bulks
Dosing time	Several hours nonstop
Maximum particle number concentration	Approx. 10^7 particles/cm^3
Mass flow (particles)	0.04 – 430 g/h (with an assumed compacted density of 1 g/cm^3)
Particle size range	0.1 – 100 µm
Carrier/dispersion gas	Random (generally air)
Pre-pressure	4 – 8 barg
Feed rate	5 – 700 mm/h
Reservoir diameter	7, 10, 14, 20, 28 mm
Maximum counter pressure	200 mbarg
Reservoir length	70 mm
Dispersion cover	Type A, type B, type C, type D
Compressed air connection	Quick coupling
Aerosol outlet connection	$Ø_{outside}$ = 8 mm / $Ø_{inside}$ = 5 mm (dispersion cover type A), $Ø_{outside}$ = 6 mm / $Ø_{inside}$ = 3.6 mm (dispersion cover type B), $Ø_{outside}$ = 6 mm / $Ø_{inside}$ = 2.5 mm (dispersion cover type C), $Ø_{outside}$ = 8 mm / $Ø_{inside}$ = 5 mm (dispersion cover type D)
Filling quantity	2.7 g (reservoir Ø = 7 mm), 5.5 g (reservoir Ø = 10 mm), 10.8 g (reservoir Ø = 14 mm), 22 g (reservoir Ø = 20 mm), 43 g (reservoir Ø = 28 mm)

Applications

- Filter industry:
  - Determination of fractional separation efficiency
  - Determination of total separation efficiency
  - Long-term dusting
  - Filter media and ready-made filters
  - Dust removal filters
  - Vacuum cleaners and vacuum cleaner filters
  - Car interior filters
  - Engine air filters
- Calibration of particle measurement devices
- Flow visualization
- Inhalation tests
- Tracer particles for LDA, PIV, etc.
- Coating of surfaces

Palas GmbH
Partikel- und Lasermesstechnik
Greschbachstrasse 3b
76229 Karlsruhe
Germany

Managing Partner:
Dipl.-Ing. (FH) Leander Mölter
Dr.-Ing. Maximilian Weiß

Commercial Register:
Mannheim HRB 103813
Place of Business: Karlsruhe
USt-Id: DE 143585902
St-Nr: 3 4416/07832

Bank Data:
BW-Bank Karlsruhe
BIC: SOLADEST
IBAN: DE77 6005 0101 7495 5026 59

Deutsche Bank Karlsruhe
BIC: DEUTDESM660
IBAN: DE95 6607 0004 0095 9460 00

Contact:
E-Mail: mail@palas.de
Internet: www.palas.de
Tel: +49 (0)721 96213-0
Fax: +49 (0)721 96213-33