RBG series

Powder disperser for extremely low and medium mass flows

RBG 1000

RBG 2000

For many applications in research, development and quality assurance and for the calibration of particle measurement devices, low-concentration powder aerosols with a concentration of just a few mg/m^3 are required.

The RBG system has been employed worldwide with great success for over 25 years to reliably disperse non-cohesive powders such as mineral dusts, medical compounds, pollen, and so forth in the size range < 100 µm and a fine fraction of < 100 nm. Monolithic solids such as chalk used in schools are dispersed finely with highest dosing constancy.

The special advantage of this dispersion system is that with a quick, easy exchange of the powder reservoir, mass flows of about 40 mg/h to 430 g/h in the case of the RBG 1000 and of about 200 mg/h to 560 g/h in the case of the RBG 2000 can be dispersed with the highest level of dosing constancy.

Generation of medium and high mass flows

For generating medium mass flows of about 8 g/h and high mass flows, the Palas® BEG 1000 powder disperser has been successfully employed worldwide for more than 20 years (see BEG 1000 datasheet).

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Advantages:

- Highest short-term and long-term dosing constancy
- Dispersion of many different dusts
- Disperses up to 3 bar overpressure (optional)
- Easy exchange of different powder reservoirs and dispersion covers
- Easy determination and adjustment of the mass flow
- Optional: remote control or computer control
- Pulse operation
- Easy cleaning of the device
- Fast, user-friendly operation
- Reliable function
- Low maintenance
- Reduces your operating expenses

Example applications:

- Filter industry
  - Determination of fractional separation efficiency
  - Determination of total separation efficiency
  - Long-term dusting
  - Filter media and assembled filters
  - Dust filters
  - Vacuum cleaners and vacuum filters
  - Car interior filters
  - Engine air filters
- Calibration of particle measurement devices
- Flow visualisation
- Inhalation analyses
- Tracer particles for LDA, PIV etc.

Technical parameters:

- Particle material: non-cohesive powders
- Particle size: < 100 µm
- Mass flow dependent on powder
  - RBG 1000: 40 mg/h–430 g/h*
  - RBG 2000: 200 mg/h–560 g/h*

* with an assumed compacted density of 1 g/cm^3

- Volume flow
  - RBG 1000: 0.5–5.0 m^3/h
  - RBG 2000: 2.5–5.0 m^3/h
- Max. back pressure:
  - Standard version up to 200 mbar
  - Pressure-resistant version up to 3 bar
- Dimensions:
  RBG 1000: 465 x 320 x 200 mm (H x W x D), weight 19 kg
  RBG 2000: 1160 x 530 x 500 mm (H x W x D), weight 40 kg
- Power supply: 115/230 V; 50/60 Hz

Accessories:

- Brush: stainless steel or plastic
- Dispersion covers: 4 versions
- Powder reservoirs: 7 sizes
- Pressure regulator
- Cleaning brush
- Tool for exchanging the brush and dispersion head
- Transportation case

RBG series
Quality in detail

The powder to be dispersed is filled into the cylindrical powder reservoir by and by and compressed by a tamper. The powder, which is uniformly compressed along the filling height, is transported onto a rotating brush at an exactly controlled feed rate. An adjustable volume flow streams over the tightly woven precision brush and pulls the particles out of the brush.

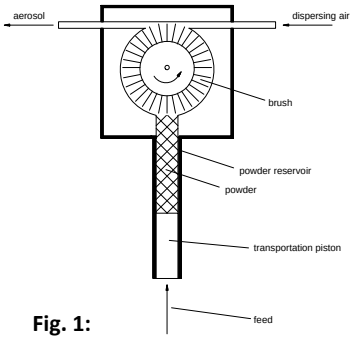

Fig. 1:
Schematic of the RBG system

Fig. 2:
Dosing unit RBG 1000 L

Dosing

Dosing is performed using a precisely controlled feed rate of the feed piston. The desired mass flows are specified easily and reproducibly by means of the cross section of the powder reservoir, the precisely adjustable feed rate of the feed piston and the easily determined compacted 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 series (compacted density 1 g/cm³)

$$\textbf{Mass flow} = \textbf{Ø Reservoir} * \textbf{Feed rate} * \textbf{Compacted density}$$

$$\textbf{Mass concentration} = \frac{\textbf{Mass flow}}{\textbf{Volume flow}}$$

Useable reservoir length:
RBG 1000: 70 mm; RBG 2000: 180 mm

The technical specifications in this sheet are for information only.
Technical modifications reserved. V0020811

Dispersing

The powder that came from the reservoir and has been loosened from the precision brush is dispersed into practically all individual particles, up to < 100 nm, at high speed in the dispersion head by the dispersion air (see Fig. 3).

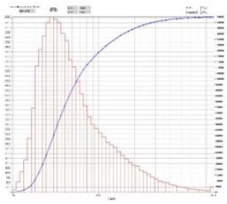

Fig 3: Particle size distribution with welas® digital 2000

Fig. 4: Dispersion covers A, B, C

For optimal dispersion, 4 different dispersion covers can be used (see Fig. 4).

	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

Pulse operation

The design of the RBG system enable pulse operation – dust, no dust – with intervals down to the second range. The function can be adjusted manually using the Stop/Down and Up buttons or automatically using an electric timer.

	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 LG	300	7–28	70
RBG 1000 LGD	300	7–20	70
RBG 1000 L	700	10 and 14	70
RBG 2000	700	16 - 32	180
RBG 2000 D	700	16, 20, 28	180

Table 3: Different versions of the RBG system

D = pressure-resistant
LG = low feed rate
L = easily removable and weighable dosing unit

All RBG versions can be optionally controlled with a remote control or a computer.
Operation with nitrogen upon request.

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