Spray Dryer Pulvis Mini Bed

Spray Dryer (For Granulating, Drying, Mixing)

GB-210B

Processing capacity	50g to 300g
Temp. control range	40 to 220°C
Sample flow	Variable up to 26ml/min
Spray nozzle (selectable)	Nozzle for liquid Nozzle for gas

Spray dryer capable of granulating and drying wet powder.

Designed to granulate powder and dry wet powder using a fluid bed. This is a fluid bed drying granulator used in combination with the basic unit GB210 and Mini-bed attachment GF200.

- Conditions such as hot air temperature, air amount, binder liquid flow amount can be set easily with the setting dial on the front of the unit
- The chamber is made of ultra hard glass and the user can observe status of the fluid bed or spraying status. Also, the flowage meter, the spraying pressure meter, the chamber inlet/outlet temperature indicator are useful for evaluation of data
- The unit can also be used as a spraying dryer by installing the mini spray attachment GF300 (optional)
- The unit has an automatic lift as a standard to enable convenient installation or removal of the glass chamber attachment

Specifications

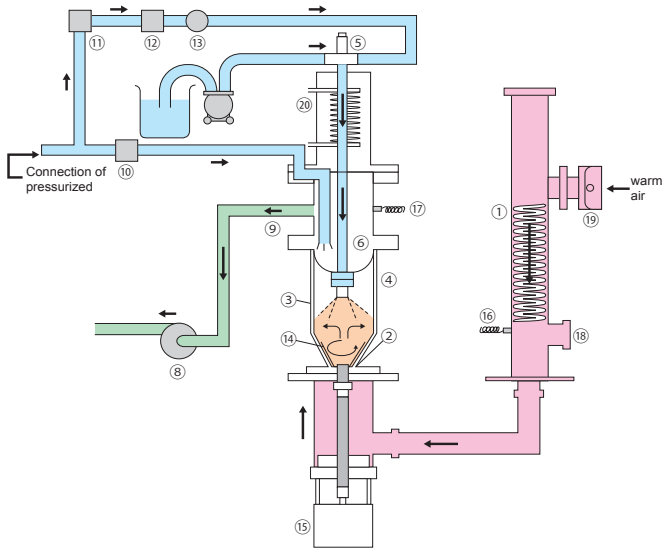
Model	GB-210B
Temp. adjusting unit setting range	40 to 220°C (inlet temperature), 0 to 98°C (outlet temperature)
Temperature adjusting accuracy	Inlet temperature ± 1°C
Spraying system	Two-way nozzle, Nozzle No. 1A as standard
Drying air amount adjusting range	0 to 0.7m^3/min
Spray air pressure adjusting range	0 to 0.3MPa
Liquid sending pump flow rate range	0 to 26mL/min
External output	Inlet temperature, outlet temperature, temperature outlet (4-20 mA)
Automatic lift	Moving up/down of glass chamber automatic lift
Temperature adjusting device	PID digital temperature adjusting device
Touch panel	Blower, heater, liquid sending pump, pulse jet switch, error display
Control select switch	Inlet temperature, output temperature control switch (outlet temp. control is conditional)
Temperature sensor	K-thermocouple
Heater	2.0 kW (at 200V) to 2.88 kW (at 240V)
Liquid sending pump	Fixed amount peristaltic pump
Spraying air pump	Spraying air compressor (sold separately) is used
Service outlet	For stirrer: AC100V, Max. 2A
Suction blower	Bypass blower, brushless DC motor
Filter	Suction filter, exhaust filter
Spray nozzle cooling mechanism	Connector: nipple x 2, O.D.: ø10.5mm
Spray air connection diameter	Nipple diameter: ø7mm
Exhaust connecting diameter	ø50mm
Safety device	Inlet/outlet temperature overheat, sample feed reverse rotation mechanism, over current electric leakage breaker, nozzle connection error
External dimensions	W760 x D420 x H1,350 mm
Weight	~110 kg
Power supply (50/60Hz) rated current	AC220V 17A, AC240V 18A, Switching of terminals necessary
Accessories	Silicon tube (with a stopper) x 3, tiron tube (with a stopper) x 2, exhaust duct (with one hose band) x 1, outlet temperature sensor, spray air tube, sample box, static electricity removal earth, Teflon braided hose 5m (with two hose bands), container table

Control Panel

Inlet temperature, outlet temperature, and drying air amount are digitally displayed. Setting is made on the touch panel that allows operation settings, operation status display as well as error display, and settings of various operation conditions.

Mini bed attachment	GF200
Processing capacity	50 to 300g (It differs depending on whether the unit is of the batch type or specific samples used.)
Flow layer chamber capacity	3L
Spray nozzle	Dual fluid nozzle: 1A standard
Stirring blades	Integrated inside the flow layer chamber
Filter	Polyester (Carbon fiber mixed PTFE membrane laminate)
Filter cleaning mechanism	Pulse jet system
Glass parts	Ultra hard glass
Weight	~13 kg

Diagram



No.	Part name	No.	Part name
(1)	Heater	(11)	3-way solenoid valve
(2)	Micro porous plate	(12)	Needle valve
(3)	Flow layer chamber	(13)	Pressure meter
(4)	Filter chamber	(14)	Stirring blades
(5)	Nozzle	(15)	Stirring motor
(6)	Filter	(16)	Inlet temperature sensor
(7)	Liquid sending pump	(17)	Outlet temperature sensor
(8)	Blower	(18)	Blind
(9)	Interim pipe	(19)	Suction port, suction filter
(10)	Solenoid valve	(20)	Nozzle cooling connection port

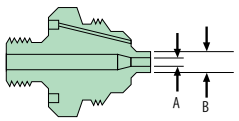
Spraying Nozzle

The tip of the nozzle comprises of a nozzle for liquid and a nozzle for gas.

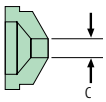
Two-way nozzle system

Easy to take apart for cleaning to prevent contamination

Nozzle for liquid(F)



Nozzle for gas(A)



Model	Nozzle No.	Size (μm)	Particle size
1A (Standard)	(F)1650	A 406 B 1270	1~40μm
	(A)64	C 1626	
1	(F)2050	A 508 B 1270	5~40μm
	(A)64	C 1626	
2A	(F)2050	A 508 B 1270	5~50μm
	(A)70	C 1778	
2	(F)2850	A 711 B 1270	10~40μm
	(A)70	C 1778	
3	(F)2850	A 711 B 1270	10~50μm
	(A)64	C 1626	

Particle sizes may vary on samples used and parameter settings.

Applications

- Granulation, drying, mixing of powder

Applications:
Medicines, food, catalyst, die, detergent, ceramics, etc.

The unit accepts sample weight as less as 50 to 300g and is suitable for experiments of expensive samples or those of a laboratory level.

Handling

Use of the one touch removal system has made removal or cleaning of the drying chamber, cyclone or the product container much easier.

Optional items

Product name	Product code
Safety cover	212784
Viton packing for cyclone inlet/outlet (1 set of 2 types)	212781
Teflon packing for cyclone inlet/outlet (1 set of 2 types)	212782
Air filter + Mist separator + Regulator set	212789
Supply air filter box (for 0.3 μm collection)	212791

Example of implementation

Sample		Binder			Test conditions					Results	
Name	Weight (min)	Name	Density (%)	Spray amount (min)	Inlet temp. (°C)	Liquid sending rate (g/min)	Spray pressure kPa (kg/cm²)	Spray times (times)	Nozzle height (cm)	Average dia. (μm)	12~115 mesh recovery rate(%)
Silicon	200	PVA	5.0	77	125	15	59 (0.6)	4	27	339	58
Oxidized iron	160	PVA	2.5	50	120	15	98 (1.0)	4	21	205	62
Ceramics	200	PVA	3.0	106	120	15	78 (0.8)	3	22	404	82
Alumina	160	PVA	3.0	60	110	15	59 (0.6)	4	22	311	88
Silica	150	CMC	1.0	100	120	15	78 (0.8)	4	22	306	60
Lactose	200	Sorbitol	70.0	10	100	14	98 (1.0)	4	25	390	80
Black tea essence	250	Guar gum	0.5	24	85	6	59 (0.6)	10	28	333	77
Grease containing powder	200	Glucose	30.0	11	85	4	59 (0.6)	7	22	236	82

*The average granule diameter is a geometric average.