

Spray Dryer Pulvis Mini Spray

Supports spray drying of fine powder of 1 μ m

GB-210A

Evaporated water Max. 1,300ml/h

Temp. control range 40 to 220°C

Sample flow Variable up to 26ml/min

Spray nozzle (selectable) Nozzle for liquid Nozzle for gas

Capable of drying ultra small samples as low as 0.5g of solid content.
Can spray dry into fine powder 1 μ m in size when optional mini cyclone is used.



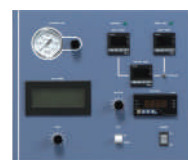
Compact spray dryer that can produce powder easily on a laboratory scale. It is capable of variety of applications from preliminary experiments in a pilot plant to drying work in general laboratories.

- Samples unstable at high temperatures can be reliably processed into fine powder. The heat is applied instantly and indirectly to the powder itself
- Prepared fine powder will not be oxidized, contains minimal moisture and is contaminant-free
- Direct drying from solution/suspension liquid to fine powder with a reduced risk of contamination. No pre or post processes such as filtration, separation, or pulverization are required
- Processing of samples containing organic solvents is made possible by connecting the Solvent Recovery Unit GAS410
- This unit can also be used as a fluid bed drying granulator by installing a separate mini bed attachment GF200 instead of GF300 spray drying attachment
- An automatic lift is equipped as standard to enable easy installation or removal of glass drying chamber attachment
- A service outlet (max. 2A) and a sample stand are equipped as standard for connecting a magnetic mixer for stirring suspended liquid sample
- Stable spray drying using a unique peristaltic pump, nozzle cooling mechanism, pulse jet mechanism and a nozzle knocker enable stable spray drying

Specifications

Model	GB-210A
Temp. adjusting unit setting range	40 to 220deg.C (inlet temperature), 0 to 60deg.C (outlet temperature)
Temperature adjusting accuracy	Inlet temperature \pm 1deg.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 26 ml/min
Spray air line washing function	Spraying at the nozzle tip, manual pulse jet system
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
Recovery of solvent	Solvent recovery unit GAS410 (sold separately) is used.
Spray nozzle cooling mechanism	Connector: nipple x 2, O.D.: ϕ 10.5 mm
Spray air connection diameter	Nipple diameter: ϕ 7 mm
Exhaust connecting diameter	ϕ 50mm
Safety function	Inlet/outlet temperature overheat, sample feed reverse rotation mechanism, over current electric leakage breaker, nozzle connection error
External size	W760 x D420 x H1,350 mm
Weight	110kg
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), a container table

Control Panel

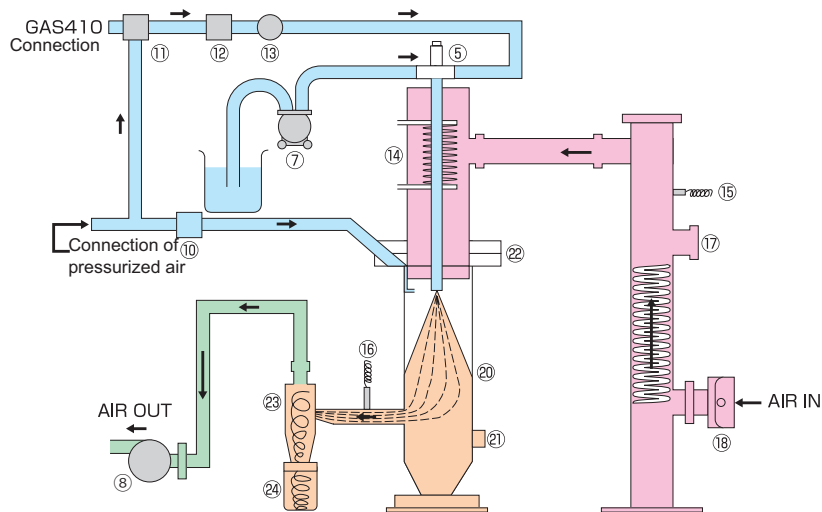


Inlet temperature, outlet temperature, and drying air amount are digitally displayed. Setting is made on the touch panel that allows operation settings, operation status display

as well as error display, and settings of various operation conditions.

Mini spray attachment	GF300
Evaporated water amount	MAX1300mL/h
Sample for drying	Suspended solution, emulsion
Ultra hard glass	Cyclone, drying chamber, product container

Diagram

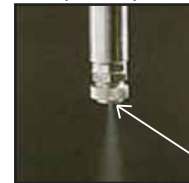


No.	Part name	No.	Part name
(1)	Heater	(16)	Outlet temperature sensor
(5)	Spray nozzle	(17)	Blind
(7)	Liquid sending pump	(18)	Suction port, suction filter
(8)	Blower, exhaust filter	(19)	Nozzle cooling connection port
(10)	Solenoid valve	(20)	Drying chamber
(11)	3-way solenoid valve	(21)	Cap
(12)	Needle valve	(22)	Distributor
(13)	Pressure meter	(23)	Cyclone
(14)	Nozzle cooling port	(24)	Product collecting container
(15)	Inlet temperature sensor		

Spraying Nozzle

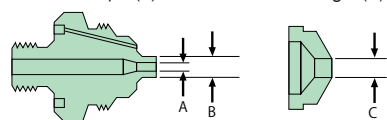


Two-way nozzle system



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



- Food and medicinal products: Powdered milk, egg yolks, soy sauce, coffee, starches, proteins, hormones, serums, antibiotics, enzymes, fragrant materials, essences, etc.
- Organic chemistry: Waxes, dyes, cleaning agents, surface acting agents, agricultural chemicals, antiseptic agents, synthesized resins, pigments, etc.
- Inorganic chemistry: Ferrites, ceramics, photocopy toners, magnetic tape materials, photosensitive materials, various industrial chemicals, waste fluid of samples, etc.

Optional items

Product name	Product code
Fine grain sample collecting cyclone	212780
Safety cover	212784
Static removal brush set	212788
Air filter + Mist separator + Regulator set	212789
Supply air filter box (for 0.3 µm collection)	212791

Handling



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



Solvent Recovery Unit GAS410

Repeatability of spray drying test

Test No.	Sample name	Sample density (%)	Drying conditions				Test sample amount (g)	Sent amount of sample liquid (g/min)	Test time (min)	Yield (g)	Recovery rate (%)
			Inlet temp. (°C)	Outlet temp. (°C)	Dry air amount (m ³ /min)	Spray air pressure kPa(kg/cm ²)					
1	Coffee solution	5	150	80	0.45	147(1.5)	198	6.6	30	8.1	81.8
2	Coffee solution	5	150	80	0.45	147(1.5)	198.7	6.6	30	8.1	81.5
3	Coffee solution	5	150	80	0.45	147(1.5)	200.6	6.7	30	8	79.8
4	Coffee solution	5	150	80	0.45	147(1.5)	198.1	6.6	30	8.2	82.8
5	Coffee solution	5	150	80	0.45	147(1.5)	199.3	6.6	30	8.4	84.3