

SINCE 1889



Yamato

for Laboratory-Scale Spray Dryers

Granulation Spray equipment Digest Version

Spray granulation, microencapsulation, micronizing, and aggregation.
Efficient powder recovery with spray dryer.

Granulation Spray equipment



GB

GB210-A

ADL

ADL311-A

DL

DL410

GAS

GAS410

Yamato Scientific Co., Ltd.

Spray granulation, microencapsulation, micronizing, and aggregation. Efficient powder recovery with spray dryer.

- Spraying increases surface area, allowing water to evaporate in a short period of time.
- It can be exposed to hot air for only a few seconds, and can be used for samples that are sensitive to heat.
- Drying and powdering in one unit. Faster than other drying methods.*1
- Support for amorphization, uniform mixing of fine particles, and microencapsulation.

*1: Comparison with freeze-drying, grinding, and constant temperature drying



Spray dry easily from a small amount of 0.5 g.

GB ADL DL

It can be easily sprayed when you want a little powder for evaluation.

Recovered powders are nano to 10µm, nano to 100µm

GB ADL DL

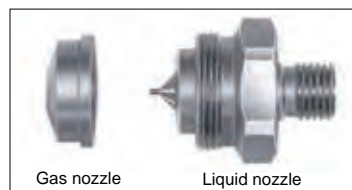
The recovered powder size of GB210-A, ADL311-A, and ADL311S-A is in the range of nano to 10µm. The GB210A, ADL311-A, and ADL311S-A are designed for the collection of fine particles that may be lost in the exhaust. An optional particulate collection cyclone is available for small powders that may be lost in the exhaust. The recovered powder of DL410 is about nano to 100 µm. In addition to the product collecting vessel, it also supports the two-point collection system using the lower chamber.

*The particle size of the recovered powder depends on the spray pressure, sample concentration, and pumping speed.

Spray nozzles that can be increased in size

GB ADL

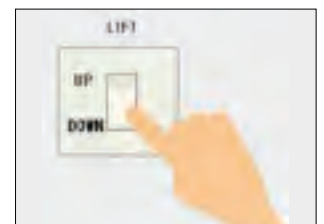
When the droplet adjustment or primary particle size is large, the spray of the high viscosity sample can obtain the optimum powder by enlarging the nozzle size.



Replace glass chamber with one finger, and automatic lift

GB

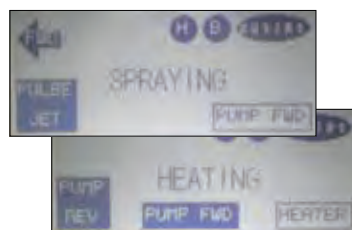
The lift switch that moves the stage up and down when attaching and detaching the glass chamber is a powerful supporter when attaching and detaching. Safety design that automatically stops when a certain amount of force is applied.



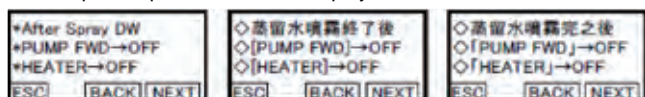
Easy operation with interactive touch panel

GB ADL DL

To start spraying or turn on the heater etc., just follow the instructions on the touch panel. HELP and the error message can be switched to three languages. (Japanese, English, and Chinese)



● Example of operation manual display



Water/Ethanol 50: 50 is also possible with an original cooler.

GB ADL GAS

Even samples with low ethanol content can be sprayed for a long time without freezing the piping path. (In combination with GB210A+GAS 410 and ADL310S-A+GAS410, spraying a mixture of water:ethanol 50:50 for more than 3 hours does not freeze the piping path.)

Pulse jetting eliminates nozzle tip clogging

GB ADL DL

When operating for a long time or spraying sugars, "icicles" generated at the nozzle tip are blown off by the jet stream. There is no need to stop spraying and wash the nozzle.



Service outlet for stirrer

GB ADL

Service outlet is provided as standard equipment for spray sample stirrers such as mag mixers.



Pharmaceuticals and Cosmetics

Heat-sensitive samples can be dried.

Lactose, proteins, enzymes, vitamins, flavors, etc.



Sample	Inlet temp.	Outlet temp.	Recovery rate
Pharmaceutical	145°C	80°C	82%

Food, Beverages and Feed

Can be dried without losing its color and fragrance.

Concentrated fruit juice, egg yolk, soy sauce, starch, extracts, etc.



Sample	Inlet temp.	Outlet temp.	Recovery rate
Soy sauce	130°C	75°C	60%

Inorganic material

Produces powders with excellent uniformity, flowability, and dispersibility.

Magnetic materials, ceramics, ferrite, industrial chemicals, sample wastewater, etc.

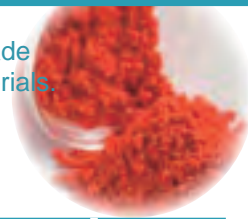


Sample	Inlet temp.	Outlet temp.	Recovery rate
Iron oxide	175°C	90°C	75%

Organic material

Powder products can be made directly from liquid raw materials.

Surfactants, synthetic resins, agricultural chemicals, dyes, waxes, etc.



Sample	Inlet temp.	Outlet temp.	Recovery rate
Resin	80°C	55°C	82%

Line-up (Size comparison)



Specifications

	Basic model	Small model, liquid only	Small model, for organic solvents	large capacity model	Solvent recovery unit	
Model	GB210-A	ADL311-A	ADL311S-A	DL410	GAS410	
Collected powder size	Nano to about 10µm			Nano to about 100µm	Combine with GB210-A and ADL311S-A when using organic solvents. • Solvent recovery method: Condenser + Refrigerator, R404A • Solvent recovery flask capacity: 2L • Required N2 gas volume: 15L/h at spray pressure of 0.1MPa • Filter: Cartridge type, filtration 0.1µm * Cannot be connected to ADL311-A and DL410.	
Evaporated water amount	Max. 1,300mL/h			Max. 3,000L/h		
Temp. controller setting range	40 to 220°C (inlet temp.)			40 to 300°C (inlet temp.)		
Liquid sending pump flow rate range	0 to 26mL/min			0 to 70mL/min		
Spray nozzle for liquid	1A (standard) I.D. 406µm			3 (standard) I.D. 711µm		
Display language	Japanese/ English/ Chinese					
Automatic lift	Glass chamber, Electric	-		-		
Service outlet	AC100V Max. 2A for stirrer					-
Pressurizer (Air compressor)	Please prepare separately					
External dimensions	760x420x1350mm	580x420x1125mm		1,060x580x1750mm		700x950x1500mm
Weight	Approx. 110Kg	Approx. 80Kg		Approx. 180Kg	Approx. 130Kg	
Power supply (breaker capacity)	AC200V 16A(20A), AC220V 17A, AC240V 18A *Terminal switching ⚡			AC200V 24A(30A) ⚡	AC200~240V 5A(15A) ⚡	
GAS410 connection	●	-	●	-	-	

⚡ The power plug is not included.

Optional Items

* Manufacturer's option (available when ordering the main unit)

Product name	Model	Product code	GB210-A	ADL311-A ADL311S-A	GAS410	Remarks
Particulate recovery cyclone	OGF10	212780	●	—	—	Highly efficient recovery of fine particles of about 1 μm
Safety cover	OGB14	212787	●	—	—	Protective cover for glass attachment part
Safety cover	ODL22	212784	—	●	—	Protective cover for glass attachment part
Static electricity removing brush	ODL38	212788	●	●	—	For removing static electricity generated by cyclones
* Inlet and outlet temperature recorder	ODL26	212792	●	●	—	Pen type, 3-point type
* Dry air flowmeter	ODL28	212793	Included by standard	●	—	Voltage type
* Dry air flowmeter	OGS12	212786	—	—	●	Differential pressure type
Regulator	ODL40	212789	●	●	—	Set of air filter and mist separator
Supply Air Filter Box	ODL42	212790	—	●	—	0.3 μm recovery
Supply Air Filter Box	OGB16	212791	●	—	—	0.3 μm recovery
* Caster frame	ODL20	212783	—	●	—	ADL311A/ADL311S-A only
Packing for cyclone inlet and outlet	OGF22	212781	●	●	—	Fluorine Rubber, 1 each for inlet and outlet
Packing for cyclone inlet and outlet	OGF24	212782	●	●	—	PTFE, 1 each for inlet and outlet
Spray nozzle	1A	281297	Included by standard	Included by standard	—	406 μm for liquid, 1626 μm for gas
Spray nozzle	1	281298	●	●	—	508 μm for liquid, 1626 μm for gas
Spray nozzle	2A	281290	●	●	—	508 μm for liquid, 1778 μm for gas
Spray nozzle	2	281291	●	●	—	711 μm for liquid, 1778 μm for gas
Spray nozzle	3	281292	●	●	—	711 μm for liquid, 1626 μm for gas
Air compressor	—	—	●	●	—	Connection Joint, with pressure Hose 2m

● No options are available for the DL410.

Related Products

Sample pretreatment



Rotary evaporator

Sample pretreatment



Ultrasonic cleaner, Bransonic

Sample pretreatment



Laboratory washer, AWD510

Sample pretreatment



Freeze dryer

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For the development of scientific technologies

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