# Spray Dryer

## Model SD-1010

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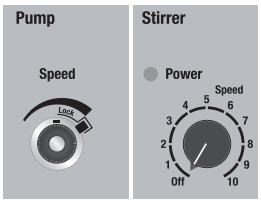
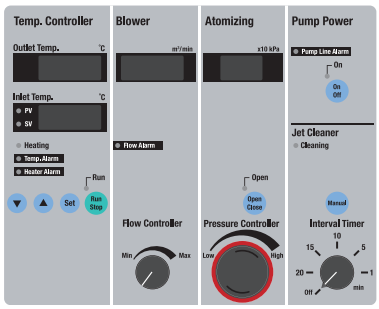
## For polymers, pharmaceuticals, organic and inorganic compounds, and new materials

- Liquid samples are directly converted into fine powder. There is no need for filtration or concentration as a pre-process, or pulverization as a post-process.
- Instantaneous drying requires a short processing time. No high-temperature load is applied to the sample.
- Experiments can be easily performed at the laboratory level since the sample can be dried even with small amounts of solids on the order of grams.
- The unit is equipped with a digital display of the inlet and outlet temperatures and the amount of drying air, as well as a recorder output for setting, checking, and recording experimental data.
- The nozzle part of the spray air line is automatically cleaned by time setting. Clogged nozzles in the sample liquid line can be cleaned by pressing the needle. A cleaning port is provided on the evaporation tube, allowing easy removal of crystals adhering to the tip of the nozzle.
- In order to prevent liquid accumulation and sample sedimentation, the layout is designed to take into account the position of the nozzle for spraying, the sample stirrer and the pump.
- To prevent disconnection or damage to the liquid delivery tube due to clogging of the spray nozzle, a discharge pressure monitoring function is provided for the liquid delivery pump.
- Equipped as standard with a magnetic stirrer, inlet (suction) filter, and outlet (air) filter to prevent sedimentation and separation of samples.
- Easy disassembly, cleaning, and assembly of equipment.
- Data (operating conditions and recovery rates from various samples) are available on our website.

■Control panel




■External output

| | Output range | Electrical signal |
|---|---|---|
| Inlet temperature | 50 to 250℃ | 0 to 10mV |
| Outlet temperature | 50 to 250℃ | 0 to 10mV |
| Dry air volume | 0 to 1m³/min | 0 to 10mV |

**Optional set**

■Model SD-1010 with recorder (Cat. No. 275190)

Recorder (μR-10000) with adjusted input range for dry air volume and temperature at 2 points is included.

| | | Model | SD-1010 |
|---|---|---|---|
| | | Cat. No. | 275178 |
| | | Type | Spray nozzle (Two-fluid nozzle) |
| Performance | | Moisute evaporation | Max. 1500mL/h |
| | | Temp. control range/accuracy | 40 to 200℃ (at inlet port) /±1℃ |
| | | Heated air volume control range | 0.2 to 0.75m³/min |
| | | Spray air pressure control range | 20 to 250kPa (0.2 to 2.5kg/cm²) |
| | | Pump flow rate range | 150 to 1700mL/h |
| | | Stirring rotation speed/capacity | 100 to 1000rpm/50mL to 2L (water) |
| Functions | | Safety functions | Evaporation tube protection cover, earth leakage, overcurrent breaker, fixed temp. overheat protector, automatic recovery from power failure, self-diagnostic function (temp. abnorlality, air volume abnormality, heater disconnection, abnormal dispensing pressure) |
| | | Spray air cleaning function | Automatic operation by time interval |
| | | Additional functions | Spray air line valve ON/OFF switch |
| | | External output | 0 to 10mV (inlet/outlet port temp., dry air volume) |
| Configuration | | Heater | 3kW |
| | | Liquid dispensing pump | Peristaltic pump |
| | | Spray nozzle | Two-fluid nozzle (nozzle hole ID 0.71mm) |
| | | Spray air pump | Air compressor (option) |
| | | Evaporation tube | Hard glass |
| | | Cyclone | Hard glass |
| | | Powder collection vessel | Hard glass (capacity 600mL) |
| | | Sample stirrer | Brushless DC motor 6W, cobalt magnet |
| | | Suction blower | Commutator motor, Max. 0.75m³/min variable flow type |
| Standard | | Tube diameter | ID3.15 x OD5.2mm |
| | | Spray air connecting port diameter | ID4 x OD6mm soft urethan tube union |
| | | Spray air pressure | Pressure 294kPa (3kg/cm²), flow rate 25L/min or more |
| | | Exhaust connecting port diameter | Exhaust port OD50mm |
| | | Interval timer | OFF or 1 to 20min (automatic intermitted time) |
| Ambiant temerature range | | | 5 to 35℃ |
| Outer dimention (mm) /Weight | | | 700W x 620D x 1500H / approx. 110kg |
| Electrial connection | | | 19.1A, 4.2kVA / AC220V single phase 50/60Hz ※ |

※Specifications are based on room temperature at 20℃, rated power supply voltage, 50 Hz, tap water, and use of silicone tubing.
※ Power plug is not included.

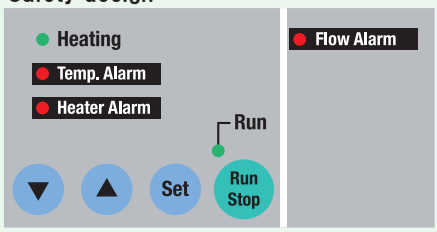
| Accessories | Silicone tube ID3.15 x OD5.2mm x 2m<br>Exhaust hose 2.5m, recorder output cable x 3pcs<br>Air piping tube ID4mm x OD6mm x 5m, Air piping connector (1/4B) |
|---|---|

See the video on Spray dryer

## Designed for safety and ease of use

## Point

### Safety design

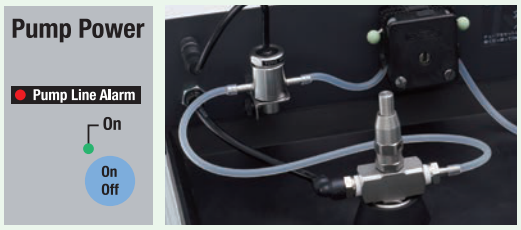



Spray dryer, Model SD-1010 is equipped with abundant safety functions, including self-diagnostic alarms for abnormal temperature, airflow, heater disconnection,and pumping pressure, leakage/over-current breaker, overheat protector and manual recovery in the event of power failure. In addition, a rubber tray is provided at the tube piping for safety design.

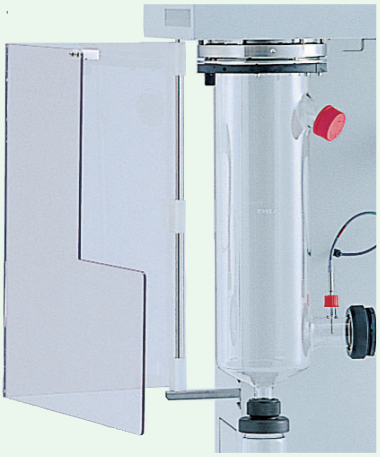
### Streamlined layout of tubing lines

The tubing line is laid out in a steamline position and at the shortest possible distance, preventing liquid accumulation and sample sedimentation.

### Abnormal pressure detection function



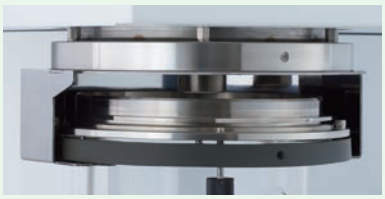

In order to prevent the dispensing tube from being disconnected or damaged due to a clogged nozzle, the pressure sensor is set in the dispensing and pressure lines to issue a pressure abnormality alarm.



### Safety design

The device is equipped with a protective cover to prevent accidental touch on the evaporation tube which becomes hot during operation.

## Point Easy maintenance



### Simple disassembly, cleaning and assembly

Equipped with a stand to prevent evaporation tubes from falling

The conventional troublesome disassembly, cleaning, and reassembly can be performed smoothly. The cyclone can be disassembled, and position alignment marks are engraved for easy setting of the evaporation tube. Filters on the inlet and outlet sides can be easily replaced through the maintenance doors on the left and right sides of the main unit.

### Suction filter (inlet)

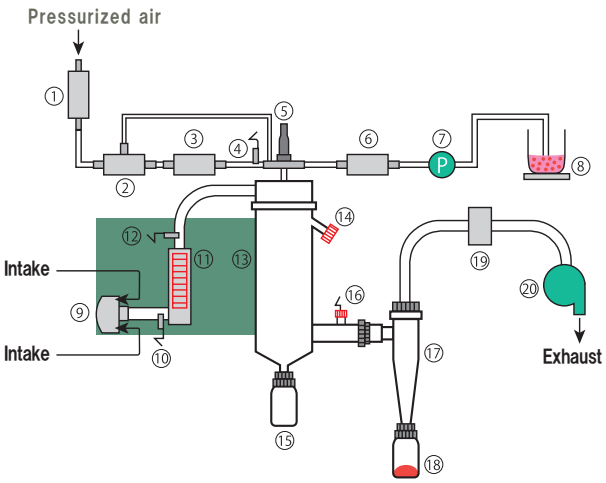
Prevents external contamination.

### Air filter (outlet)

Protects the suction blower.

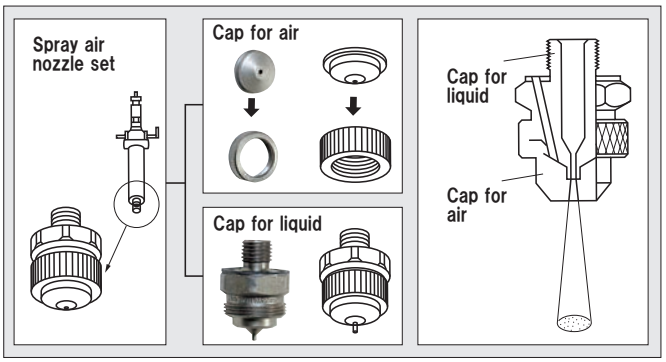
### Flow sheet

■Model SD-1010




① Spray air line valve (solenoid valve)
② Three-way solenoid valve
③ Regulator
④ Pressure sensor (spray air)
⑤ Spray air nozzle
⑥ Liquid dispensing pressure sensor
⑦ Liquid dispensing pump
⑧ Sample stirrer (magnetic)
⑨ Suction filter (Inlet)
⑩ Sensor (wind speed)
⑪ Heater
⑫ Sensor (inlet temperature)
⑬ Evaporation tube
⑭ Spray nozzle rinse port
⑮ Separator
⑯ Sensor (outlet temperature)
⑰ Cyclone
⑱ Powder collector
⑲ Air filter (outlet)
⑳ Suction blower

## Caps for nozzles




| Caps (Hole diameter mm) | | Nominal diameter | Spray air Flow rate at P pressure [kPa (kg/cm2)] (L/min) | Sample type | Cat. No. |
|---|---|---|---|---|---|
| For liquid | PF-1650-SS (0.41) | 1A | 68.67 (0.7) →1.3 to 147.15 (1.5) →17.0 | Homogeneous solution | 120710 |
| For air | PA-64-SS (1.6) | | | | 120740 |
| For liquid | PF-2050-SS (0.51) | 1 | 68.67 (0.7) →13.3 to 147.15 (1.5) →20.0 | Slurry concentration Approx. 5% | 120720 |
| For air | PA-64-SS (1.6) | | | | 120740 |
| For liquid | PF-2050-SS (0.51) | 2A | 68.67 (0.7) →23.0 to 147.15 (1.5) →36.0 | Slurry concentration Approx. 5% | 120720 |
| For air | PA-70-SS (1.75) | | | | 120750 |
| For liquid | PF-2850-SS (0.71) | 2 (standard) | 68.67 (0.7) →19.3 to 147.15 (1.5) →31.0 | Slurry concentration Approx. 5 to 20% | 120730 |
| For air | PF-70-SS (1.75) | | | | 120750 |

## Needles (for spray air nozzle)

| Hole diameter | For 0.41mm | For 0.51mm | For 0.71mm |
|---|---|---|---|
| Cat. No. | 180250 | 180260 | 180270 |

## Exhaust hose

2.5m Cat. No. 179980
※Standard accessories

10m Cat. No. 179990

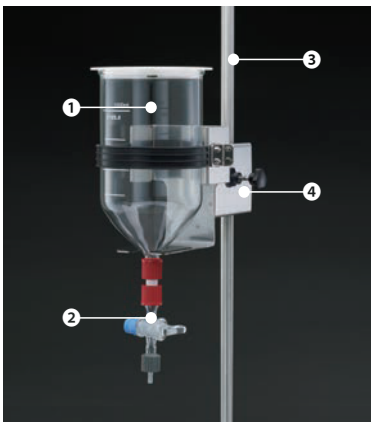
## Silicone tube

(ID3.15 x OD5.2mm x 5m)
Cat. No. 125510

## Hot plate unit Model HTP-1000

Ultimate temperature
Max. 180℃ (plate surface)
Stirring table dimensions
φ135mm
Cat. No. 275300

External temperature sensor
Cat. No. 265680




## Vessel set with drain port

Cat. No. 275640

Set configuration

①Vessel with drain port
Cat. No. 275210

②Two-way cock set
Cat. No. 275220

③Pole for SD-1010
Cat. No. 275200

④Holder for vessel with drain port
Cat. No. 275230

Suction filter (inlet)
Cat. No. 179950
※Standard accessories

Air filter (outlet)
Cat. No. 179960
※Standard accessories

Separator / powder collector (600mL)
Cat. No. 146750
※Standard accessories

Powder collector (1.2L)
Cat. No. 147940

※Resin-coated EYELACOAT® bottles that can reduce shattering of glass are also available. Please contact us for more details.

## Recorder


| Product name | Recorder |
|---|---|
| Model | μR-10000 (for SD-1010) |
| Cat. No. | 219260 |
| Measurement points | 6 points/6 ribbon colors |
| Measurement cycle | 6 points/10sec (fastest) |
| Input | DCV: 5 types, TC: 1 type, RTD: 2 types |

## Air compressor

| Product name | Air compressor | |
|---|---|---|
| Model | 0.2LE-8SBA | 0.4LE-8SB |
| Discharge air volume (50/60Hz) | 20/24L/min | 42/49L/min |
| Tank capacity | 30L | |
| Control pressure (kgf/cm²) | 3.5 to 5.0 | 5.0 to 7.5 |

※Please source an equivalent model as a base locally.