

Air Sampling Pump

# SP209 Series

● SP209-100Dual

● SP209-1000Dual



# SP209-100Dual • SP209-1000Dual

## Features

### For Accuracy Control of Flow Measurement

SP209 can perform two (2) lines sampling at once by two (2) pumps. It also can perform integration of suction and its volume. Flow rate is set to display the value in 20°C conversion.

### The Large Flow Rate Range is Covered

SP209-1000 Dual corresponds to the sampling cartridge which suction resistance can be large different by formaldehyde and VOC by one set. SP209-100 Dual is very high accuracy in low flow rate range and suitable for thermal desorption.

### Correspondence to Suction Resistance Change

The suction capability of pumps is adjusted to be able to perform sampling at stable flow rate since it has a function that setting flow rate is maintained even if suction resistance of trapping materials or cartridge is changed. Especially when sampling is performed in a low flow rate range, the pump's revolution speed is getting slower, and noise or consumption power can be down.

### Multiple Function

#### Setup of sampling conditions

A sampling start can be selected from the conditions of Real Time (year, month, day, hour and min) after setting time (minute) progress.

#### Setup of sampling end conditions

A sampling end can be selected from the lapsed time from a sampling start, the total sampling volume and the conditions of sequencing

(it stops manually).

#### Sampling conditions are saved as file

Checking functions can be performed by a personal computer.

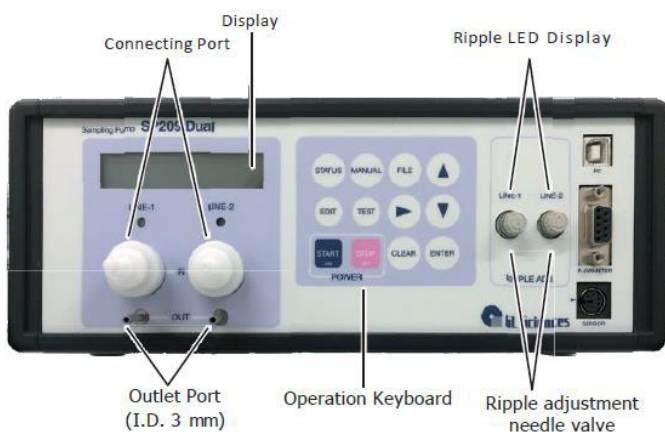
Software is an option.

#### Data logging function

It is possible to visualize the sampling results on the PC.

### Pulse Adjustment to Obtain Optimal Conditions

In order to obtain optimal conditions between the sampling tube and cartridge friction and the suction capability, the pump pulse is detected and the result is indicated by a three color LED (High, Good, Low). When pulse (High, Low) is displayed, adjust the pulse valve manually till you obtain "Good".



## Applications



### SP209-100Dual (2 mL/min-100 mL/min)

- Suitable for sampling (solid phase adsorption/thermal desorption) of VOC in indoor air measurement.
- Suitable for sampling of building materials outgassing by micro chamber.

### SP209-1000Dual (20 mL/min-1000 mL/min)

- Suitable for sampling of the formaldehyde in indoor air measurement, and sampling (solid phase adsorption/solvent sampling process) of VOC.
- Suitable for sampling of building materials outgassing by small chamber.

## Other Features



### ● Hose Connections

(standard accessory)

These are hose step connections to which it is possible to connect I.D. 3 mm and 5 mm flexible tubing.



### ● Filter Joint

It is possible to replace the filter and to connect any kind of joints.



### ● Cable Connector

The cable connectors have been placed on the front size of the pump to make easier to connect and disconnect the cable.

## Specifications

Model	SP209-100Dual	SP209-1000Dual
Suction Flow Rate Range	2 mL/min to 100 mL/min	20 mL/min to 1000 mL/min
Flow Rate Measurement Accuracy	10 mL/min to 20 mL/min (within $\pm 10\%$ )	100 mL/min to 200 mL/min (within $\pm 10\%$ )
	21 mL/min to 100 mL/min (within $\pm 5\%$ )	201 mL/min to 1000 mL/min (within $\pm 5\%$ )
Flow Rate Measurement Tolerance	$\pm 1$ digit	
Setting Items	Start Condition: Promptly, After setting time, Real time End Condition: After setting time, after reaching to integrating capacity, sequence (manual stop)	
Integrating Range	0.1 L to 999.9 L	0.1 L to 9999.9 L
Storage Files	5	
Flow Channels	2	
Operation Temp. Humidity Range	10°C to 35°C (10°C to 30°C), 20% to 80% RH (No condensation)	
Power Supply	DC12 V (AC adaptor: AC100-240 V 50/60 Hz)	
Power Consumption	DC12 V: 0.5 A AC100 V: 0.15 A AC220 V: 0.08 A	DC12 V: 0.9 A AC100 V: 0.2 A AC220 V: 0.1 A
Weight	3 kg approx.	
Dimension	260 (W) x 230 (D) x 99 (H) mm	

#### Remarks

- 1) If the suction capability of the pump is too low compared to the cartridge friction, the suction according to the set flow may not be possible.
- 2) When the suction flow of SP209-100Dual is below 10 mL/min, the Flow Rate Measurement Accuracy is out of the range, but it is possible to set the suction flow at 2 mL/min to 100 mL/min.
- 3) When the suction flow of SP209-1000Dual is below 100 mL/min, the Flow Rate Measurement Accuracy is out of the range, but it is possible to set the suction flow at 20 mL/min to 1000 mL/min.
- 4) This instrument cannot be used to detect corrosive gasses or used in atmosphere. And its structure is not anti-explosive.

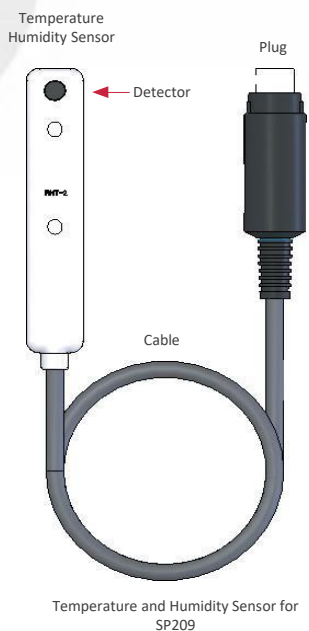
## Product Lineup

Description	Q'ty	Cat.No.
Air Sampling Pump SP209-100Dual	1	2702-17582
Air Sampling Pump SP209-1000Dual	1	2702-17583
SP209 Dual Filter Element	10	2702-37632
AC Adaptor Set for SP209	1	2702-36025

# SP209 Options

## Temperature and Humidity Sensor for SP209

Temperature and Humidity Sensor for SP209 can be connected to the SP209 to record temperature and humidity at the same time.



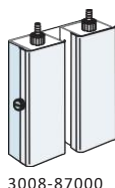
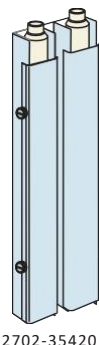
### Specifications

Humidity Range	0% to 100% RH *
Humidity Accuracy	± 3% RH at 25°C (20% to 80% RH)
Temperature Range	-30°C to 80°C *
Temperature Accuracy	± 0.5°C (at 25°C)
Case material	PC

\* This is not the operation temperature and humidity of this device.

Description	Q'ty	Cat.No.
Temperature and Humidity Sensor for SP209 Dual	1	2702-35475

## Stand/holders



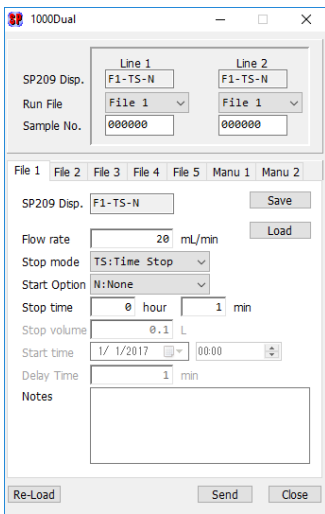
Description	Q'ty	Cat.No.
Dedicated Stand	1 set	2702-35480
Holder for Collection Tube Set	1 set	2702-35420
Holder for Aldehyde Collection Cartridge*	1 set	3008-87000

\* Usable for both InertSep mini AERO DNPH and Sep-Pak DNPH

# PC control software, SP209Assistant

Editing/writing/reading of collection condition file can be done through a PC when the PC where SP209Assistant is installed is connected with SP209 via USB cable. The operability of SP209 can be improved and the various data recorded can be read during the run.

Data log function during the collection run is incorporated. During the run, collection flow rate (instantaneous measured flow rate), temperature, and humidity can be recorded and graphically displayed on a PC screen. In case of the collection for a long time, it can be confirmed whether there occurred any abnormality in flow rate of the pump or temperature (temperature inside of chassis) during the collection run. (For recording temperature or humidity, a dedicated temperature/humidity sensor is required; it is available as an optional accessory.)



Setting screen for sampling conditions

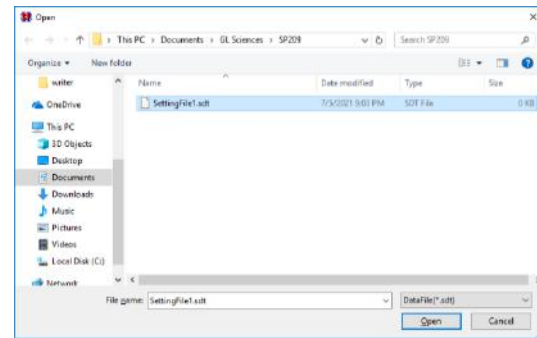
## Setting contents of sampling conditions

- Editing of file mode (File 1 ~ 5)
- Setting of manual mode (Manu 1, 2)
- Saving created file in on a PC
- Writing the setting contents after sending to SP209
- Reading the setting contents after receiving from SP209



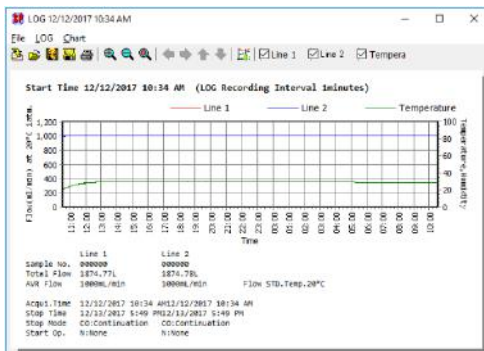
Main menu screen

When the control of SP209 is booted up, the main menu screen will appear. By clicking each icon, each screen will show up.



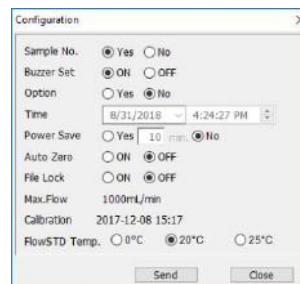
## Opening the saved file and sending to SP209 for writing

The setting contents edited by PC can be saved with a file name. By sending the saved file to SP209 after reading, the setting contents in SP209 can be overwritten.



## Log (recording) function

Display of collection results  
Accumulated flow rate (volume), instantaneous (measured) flow rate, average flow speed, time to start, time to stop



## Configuration function

For various environment settings of the SP209 main unit

Supported OS: Windows 7 Professional · Windows 10 Professional  
Supplied media: CD-ROM  
USB port, CD-ROM drive required  
Accessories: SP209 Connection cable, Instruction manual  
\*Windows is a registered trade name of Microsoft Corporation in the U.S. valid in the U.S. and other countries

Description	Cat.No.
PC control software, SP209Assistant	2702-35470

# SP209 Series Tubing Kit

## SP209 Dual tubing kit

Cat.No. 3001-11541



Description	Type	Q'ty
① Male Connector	SS-200-1-2ST	2 ea.
② PTFE Joint Reducing Union	3RU6T	2 ea.
③ PTFE Ferrule Double Ring Type	3 mm	10 sets
④ Lure Fitting	Female lure hub 3 mm	2 ea.
⑤ Lure Fitting	Female lure hub 4 mm	2 ea.
⑥ Lure Fitting	Male lure hub 3 mm	2 ea.
⑦ Lure Fitting (inner diameter 4 mm for tube)	Male lure / hose connector	2 ea.
PTFE Tube	3 mm O.D. x 2 mm I.D. x 5 m Length	1 ea.
Silicon Tube	4 mm O.D. x 2 mm I.D. x 10 cm Length	1 ea.
Silicon Tube	6 mm O.D. x 3 mm I.D. x 5 m Length	1 ea.
Silicon Tube	9 mm O.D. x 5 mm I.D. x 5 m Length	1 ea.

\*The above items can be used for SP208 Dual II.

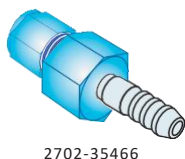
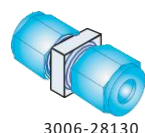
## Parts for Tubing Kit

Description	Type	Q'ty	Cat.No.
① Male Connector	SS-200-1-2ST	1 ea.	3006-52822
② PTFE Joint Reducing Union	3RU6T	1 ea.	3006-28336
③ PTFE Ferrule Double Ring Type	3 mm	10 sets	3006-66230
④ Lure Fitting	Female lure hub 3 mm	2 ea.	3008-87024
⑤ Lure Fitting	Female lure hub 4 mm	2 ea.	3008-87026
⑥ Lure Fitting	Male lure 3 mm	2 ea.	3008-87025
⑦ Lure Fitting (inner diameter 4 mm for tube)	Male lure / hose connector	10 ea.	5010-52017

\*For more information about Tube, please contact us or our distributor.

# SP209 Series Accessories

## Various Accessories

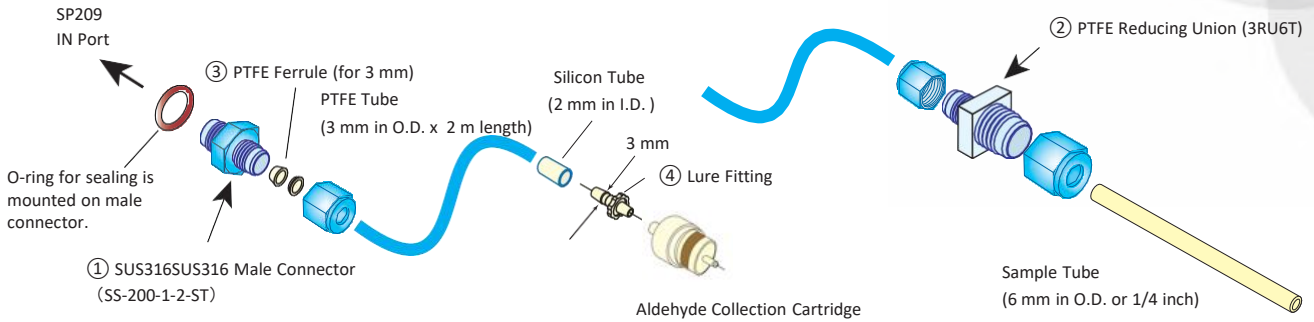


Description	Q'ty	Cat.No.
PTFE Union 3UT	1 ea.	3006-28130
PTFE Reducing union 3RU6T	1 ea.	3006-28336
Hose connector SS-2-HC-1-200	PTFE with ferrule, 2 ea. /set	2702-35465
Hose connector SS-4-HC-1-200	PTFE with ferrule, 2 ea. /set	2702-35466
PTFE Spiral Tube 3 x 2 x 3 m	2 ea.	2702-35461
Tube Container	4 ea.	3008-68350
Female Lure / Hose Connector - PP made	10 ea.	5010-52018

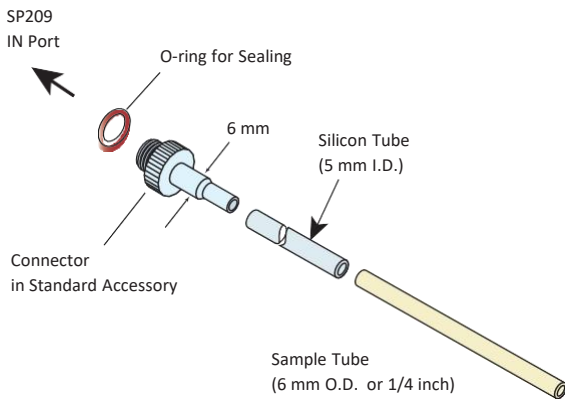
# How to Use Tubing Parts

Connect the collection tube or cartridge to the suction port of SP209 in the manner as shown in the figure below. Cut the PTFE tube or silicon tube in the suitable length required.

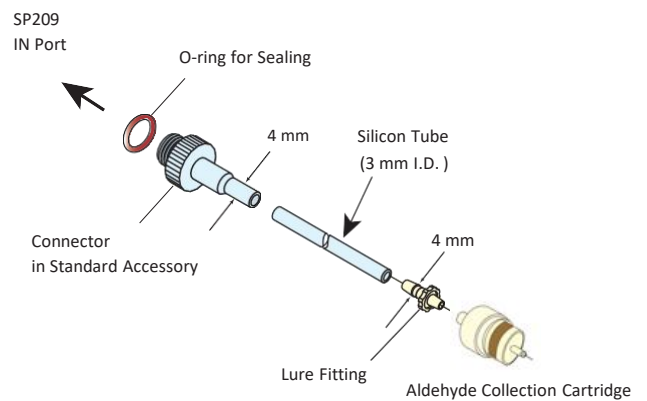
## Example of Connection for PTFE Tube with 2 mm I.D.



## Example of Connection for Silicon Tube with 5 mm I.D.



## Example of Connection for Silicon Tube with 3 mm I.D.



# Calibration Function

Calibration drying tube kit for SP209 will trap the soap generated from high precision film flowmeter. As shown in the right figure, by connecting the exit port of standard flowmeter with the suction port of SP209 Dual, direct flow calibration can be done.

### Configuration of Calibration Drying Tube Kit for SP209

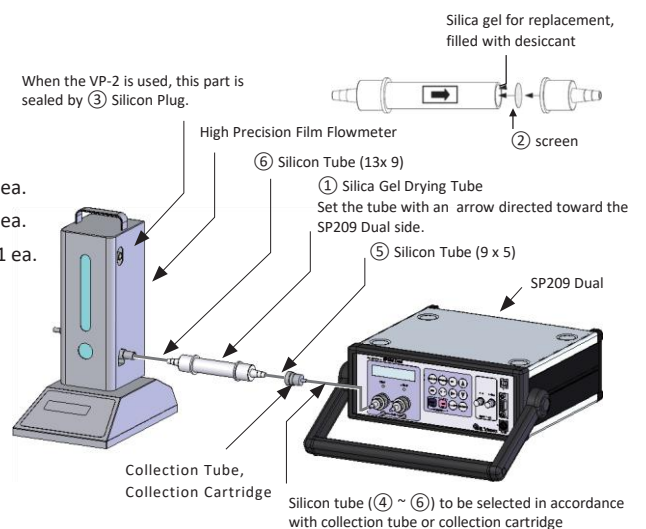
- ① Silica Gel Drying Tube x 1 set
- ② Screen x 20 ea.
- ③ Silicon Plug x 1
- ④ Silicon Tube (6 O.D. x 3 mm I.D. x 2 m Length) x 1 ea.
- ⑤ Silicon Tube (9 O.D. x 5 mm I.D. x 2 m Length) x 1 ea.
- ⑥ Silicon Tube (13 O.D. x 9 mm I.D. x 2 m Length) x 1 ea.

Description	Q'ty	Cat.No.
Calibration Drying Tube Kit for SP209	1 set	3001-11540

Remarks 1) This is usable for SP208 Dual II.

Remarks 2) For calibration in auto mode, an optional communication cable for flowmeter (Cat. No : 3001-11540) is required.

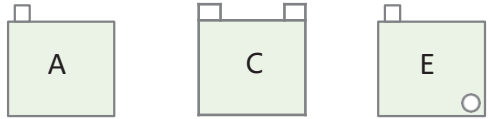
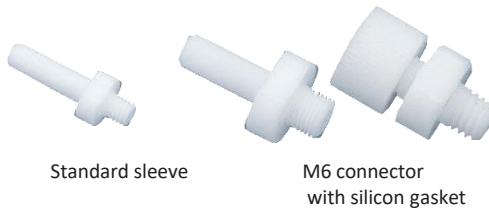
Notice) Flow rate accuracy cannot be guaranteed when the flow rate adjustment is carried out by the customer.



# Products Related to Sampling

## How to elect the shape of sampling bag




(e.g.) ①  
Smart bag PA ②  
A ③  
A ④  
10




①	Description	Smart bag PA / Smart bag 2F / ANALYTIC-BARRIER bag / SkyPier bag Tedlar bag / Fluororesin bag / Aluminum bag
②	Bag shape	 <p>□ : Sleeve or sleeve with mini-valve ○ : M6 connector</p>
③	Connector type*	<p>A : Single-end standard sleeve AS : Single-end 7 mm O.D. sleeve</p> <p>AK : Single-end sleeve 6 mm O.D. with mini valve</p> <p>B : Single-end M6 connector</p> <p>C : Dual-end standard sleeve CS : Dual-end 7 mm O.D. sleeve</p> <p>CK : Dual-end sleeve 6 mm O.D. with mini valve</p> <p>D : Dual-end M6 connector</p> <p>E : Single-end standard sleeve+Single-end M6 connector</p> <p>EK : Single-end sleeve 6 mm O.D. with mini valve +Single-end M6 connector</p> <p>F : Single-end PP sleeve (Smart bag A type only)</p> <p>G : Dual-end PP sleeve (Smart bag C type only)</p> <p>AA8 : Single-end 8 mm O.D. sleeve</p> <p>AAJ8 : PTFE joint for connecting single-end 8 mm O.D. (Aluminum bag A type only)</p> <p>CCJ8 : PTFE joint for connecting dual-end 8 mm O.D. (Aluminum bag A type only)</p> <p>AAP8 : PTFE joint for connecting single-end 8 mm O.D. +Single-end 8 mm O.D. sleeve with valve (Aluminum bag only)</p>  <p style="text-align: center;">Standard sleeve                      M6 connector with silicon gasket</p>
④	Volume (L)	1 L, 2 L, 3 L, 5 L, 10 L Other bag sizes from 0.1 L up to 500 L and Tedlar bags up to 2000 L can be manufactured.



# Products Related to Sampling

## Accessories for Sampling Bags

Name	Standard Sleeve (6 mm · 7 mm · 8 mm O.D.)	PP Sleeve	Sleeve with Mini Valve (φ6 O.D.)
Shape			
Purpose	This is convenient to connect with tube.	This is a PP sleeve made for Smart bags and is convenient to connect with tube. Due to its special shape, the gas hardly remains in the bag.	This is convenient to connect with tube. The open/close valve is provided, assuring no leakage of the gas sampled.
Material	PTFE	Polypropylene	PTFE
Replacement part	Not available	Not available	Available

Name	M6 Connector with Silicon Gasket	Sleeve with Valve (8 mm O.D.)	PTFE Valve (8 mm O.D.)
Shape			
Purpose	Silicon gasket is provided, suitable for operation using a syringe.	This is dedicated to aluminum bag. Attached silicon gasket is suitable for operation using a syringe.	This is dedicated to aluminum bag. Attached silicon gasket is suitable for operation using a syringe.
Material	PTFE	Polypropylene	PTFE
Replacement part	Available	Available	Available

Description	Details	Q'ty	Cat.No.
Sleeve with Mini Valve (6 mm O.D.) for Replacement	With Silicon Gasket	1 ea.	3008-39998
M6 Connector for Replacement	With Silicon Gasket	1 ea.	3008-39997
Sleeve with Valve (8 mm O.D.) for Replacement	With Silicon Gasket	1 ea.	3008-29999
PTFE Valve (For 8 mm O.D.) for Replacement	With Silicon Gasket	1 ea.	3008-29998

### Consumables for Connectors

Description	Purpose	Q'ty	Cat.No.
Plug for Sleeve 7 mm O.D. to 8 mm O.D.	Plug for O.D. 7 mm and 8 mm	50 ea.	3008-35006
Cap for Sleeve 6 mm O.D.	Cap for 6 mm O.D. sleeve and sleeve with mini valve, PP sleeve	30 ea.	3008-35105
Silicon Gasket for M6 Connector	Gasket for M6 connector	50 ea.	3008-35016

## Smart Bag PA

This is a bag made of vinyl alcohol series polymer film and has superior solvent resistance, heat resistance and adsorption resistance, assuring an extremely small amount of elution of impurities from the materials. In addition, it has excellent permeation resistance and does not permeate most gases. Due to its special characteristics, this bag can be applied to a wide range of samples, from inorganic gases to gaseous organic compounds. The upper temperature limit of this bag is 120°C.

Model	1 L	2 L	3 L	5 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AF	3008-48101	3008-48102	3008-48103	3008-48105
AA	3008-97101	3008-97102	3008-97103	3008-97105
AAK	3008-97201	3008-97202	3008-97203	3008-97205
CG	3008-48401	3008-48402	3008-48403	3008-48405
CC	3008-97401	3008-97402	3008-97403	3008-97405
CCK	3008-97501	3008-97502	3008-97503	3008-97505
CEK	3008-97701	3008-97702	3008-97703	3008-97705

Model	10 L	20 L	30 L	50 L	100 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AF	3008-48110	3008-48120	3008-48130	3008-48150	3008-48160
AA	3008-97110	3008-97120	3008-97130	3008-97150	3008-97160
AAK	3008-97210	3008-97220	3008-97230	3008-97250	3008-97260
CG	3008-48410	3008-48420	3008-48430	3008-48450	3008-48460
CC	3008-97410	3008-97420	3008-97430	3008-97450	3008-97460
CCK	3008-97510	3008-97520	3008-97530	3008-97550	3008-97560
CEK	3008-97710	3008-97720	3008-97730	3008-97750	3008-97760

For capacities other than the above and other sampling backs, please contact us or our distributor.

## Tedlar Bag

This bag has superior resistance to organic solvent. In addition, it is excellent in mechanical strength and usable in a wide temperature range, from 70°C to 100°C. In general, this bag is suitable for use with a wide range of samples from inorganic gas to gaseous organic solvent.

Model	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-11101	3008-11102	3008-11103	3008-11105	3008-11110
AAK	3008-91101	3008-91102	3008-91103	3008-91105	3008-91110
AAS	3008-11701	3008-11702	3008-11703	3008-11705	3008-11710
AB	3008-11201	3008-11202	3008-11203	3008-11205	3008-11210
CC	3008-13301	3008-13302	3008-13303	3008-13305	3008-13310
CCK	3008-93301	3008-93302	3008-93303	3008-93305	3008-93310
CCS	3008-13801	3008-13802	3008-13803	3008-13805	3008-13810
CD	3008-13401	3008-13402	3008-13403	3008-13405	3008-13410
CE	3008-13501	3008-13502	3008-13503	3008-13505	3008-13510
CEK	3008-93501	3008-93502	3008-93503	3008-93505	3008-93510
EE	3008-15501	3008-15502	3008-15503	3008-15505	3008-15510
EEK	3008-95501	3008-95502	3008-95503	3008-95505	3008-95510

For capacities other than the above and other sampling backs, please contact us or our distributor.

## Aluminum Bag

Aluminum bag is made of laminated film consisting of 5 layers including, from the outer layer, nylon, polyethylene, aluminum foil, polyethylene, and polyethylene. It has a sufficient mechanical strength and would not permeate almost all gases including inorganic gas or methane gas. It is also very effective for the samples which require light shielding. The organic solvent with the high boiling point is rather adsorptive for this bag and some organic substances may elute from the bag itself. There is a large-sized line-up of bags from 20 L to 200 L, in addition to many kinds of bags from 1 L to 200 L.

### Specifications

- Made of laminated film consisting of 5 layers including, nylon, polyethylene, aluminum foil, polyethylene, polyethylene
- Upper-temperature limit: 65°C
- Permeability resistance to inorganic gas, methane, etc.
- Film thickness: 120 µm

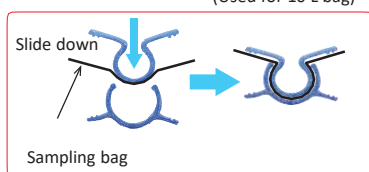
Main application: Organic solvent, etc.

Model	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-26101	3008-26102	3008-26103	3008-26105	3008-26110
AAK	3008-26201	3008-26202	3008-26203	3008-26205	3008-26210
CCK	3008-26301	3008-26302	3008-26303	3008-26305	3008-26310
CEK	3008-26401	3008-26402	3008-26403	3008-26405	3008-26410

## Clip for Sampling Bag



Example of use  
(Used for 10 L bag)



Sampling bag

This is used to seal the bag with one side open

- **Specifications**
- Length: 50 cm
- Upper-temperature limit: 65°C

Description	Q'ty	Cat.No.
Clip for Sampling Bag (For 10 L)	1 ea.	3008-18000

Remarks) Clips for the bag of less than 10 L are also available. Please contact.

GL Sciences Website



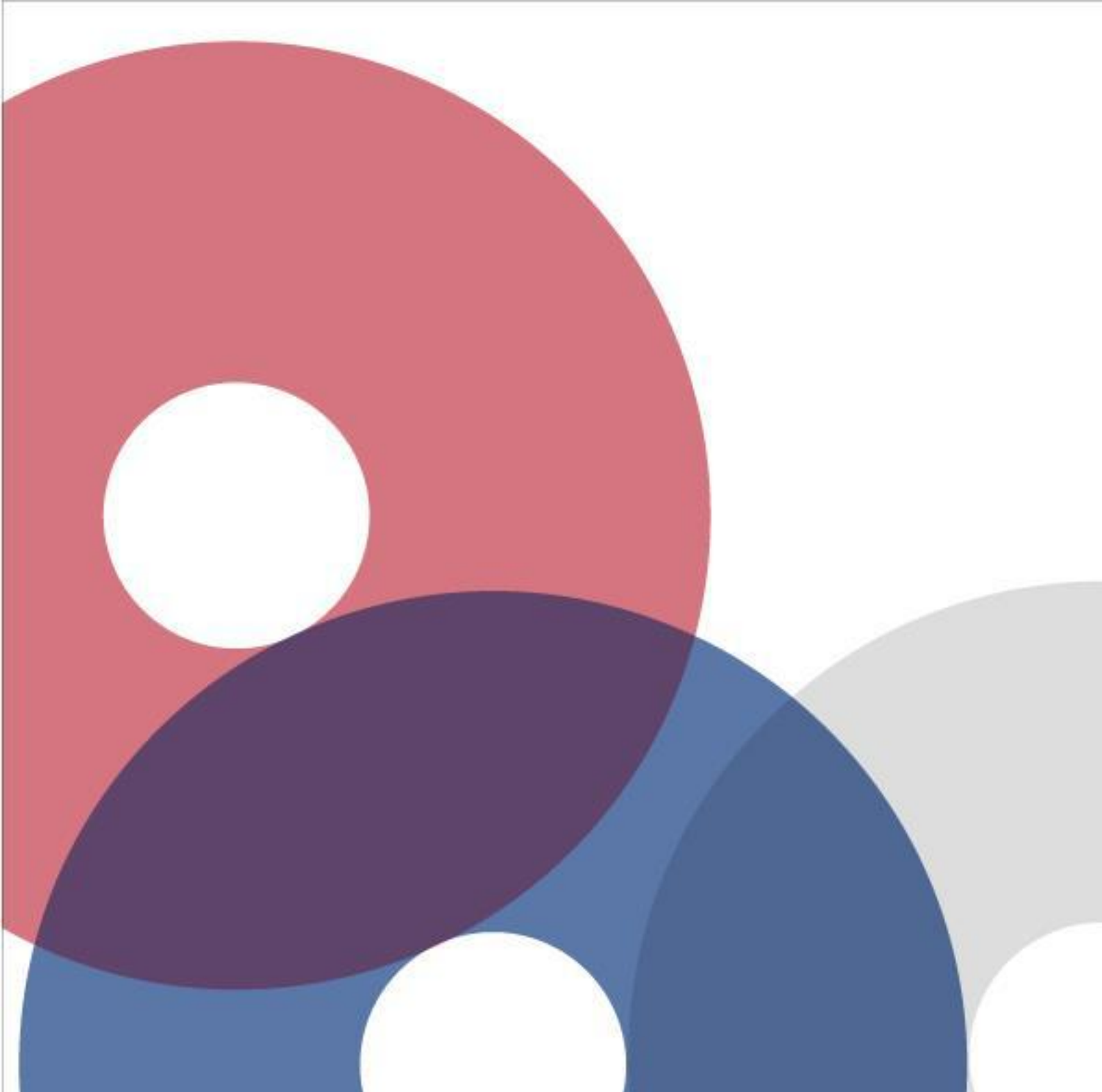
Regarding the sampling bags of other sizes or the sampling bags such as Tedler bags or SkyPier bags, visit the following URL for confirmation.

[https://www.glsciences.com/product/gas\\_sampling/sampling\\_bag/index.html](https://www.glsciences.com/product/gas_sampling/sampling_bag/index.html)



Information on how to connect from sampling bags to aldehyde collection cartridge or heat desorption collection tube is described here. Refer to the following URL.

[https://www.glsciences.com/product/gas\\_sampling/sampling\\_bag/02573.html](https://www.glsciences.com/product/gas_sampling/sampling_bag/02573.html)



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GL Sciences Inc. Japan  
22-1 Nishishinjuku 6-chome  
Shinjuku-ku, Tokyo  
163-1130, Japan

Phone: +81-3-5323-6620  
Fax: +81-3-5323-6621  
Email: [world@glsc.co.jp](mailto:world@glsc.co.jp)  
Web: [www.glsciences.com](http://www.glsciences.com)

GL Sciences Inc. USA  
4733 Torrance Blvd. Suite 255  
Torrance, CA 90503  
USA

Phone: +1-310-265-4424  
Fax: +1-310-265-4425  
Email: [info@glsciencesinc.com](mailto:info@glsciencesinc.com)  
Web: [www.glsciencesinc.com](http://www.glsciencesinc.com)

GL Sciences B.V.  
Dillenburgstraat 7C  
5652AM, Eindhoven  
The Netherlands

Phone: +31-40-254-9531  
Email: [info@glsciences.eu](mailto:info@glsciences.eu)  
Web: [www.glsciences.eu](http://www.glsciences.eu)

GL Sciences (Shanghai) Limited  
Tower B, Room 2003  
Far East International Plaza  
No.317 Xianxia Road, Changning District  
Shanghai, China 200051

Phone: +86-21-62782272  
Email: [contact@glsciences.com.cn](mailto:contact@glsciences.com.cn)  
Web: [www.glsciences.com.cn](http://www.glsciences.com.cn)