

HyperCOOL™ Freeze Dryer



Features

- Provides wide solvent coverage by dropping temperature down to -55°C, 80°C, -110°C
- HyperCOOL by itself, when equipped with manifolds or chambers, becomes a versatile freeze dryer
- The compatible vacuum rotary vane pump generates vacuum down inside the chamber
- Defrost Function available (Hot-gas)
- Magnet embedded front cover of the condenser for very convenient cleaning
- Extended applications for concentrating wider range or larger volume of solvents
- Basic Model : 0 ~ 760 Torr (Vacuum value below "0" is not displayed)
- Optional Pirani Sensor to display precise vacuum value below 1 Torr (0.001~760 Torr).

Applications

- Pharmaceutical study and production
- Research and production of vaccine and antidote
- Drying and preservation of plants, food and etc.
- Archaeological study

Freeze Drying

The freeze drying, also known as lyophilization is a dehydration technique through sublimation process, the shift from the solid directly into the gas without passing through liquid phase. The materials must be frozen completely to remain as solid state during sublimation process. Additionally, applying vacuum enables to lower the pressure below triple point, which to avoid the liquid phase. The freeze drying technique is used in various applications in food industry, pharmaceutical and biotechnology field and other industrial areas. HyperCOOL system allows complete removal of residual moisture.

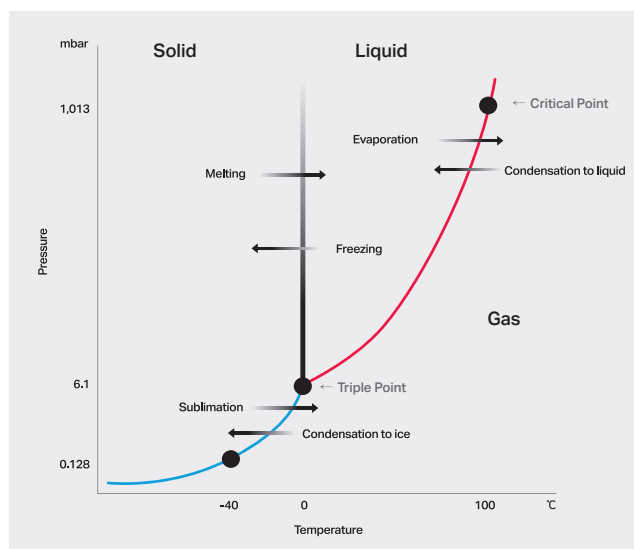
Freezing Point Depression

$$\Delta T = iK_f m$$

ΔT = Decrease in solution freezing point

K_f = Freezing point depression constant for the solvent

m = Molality

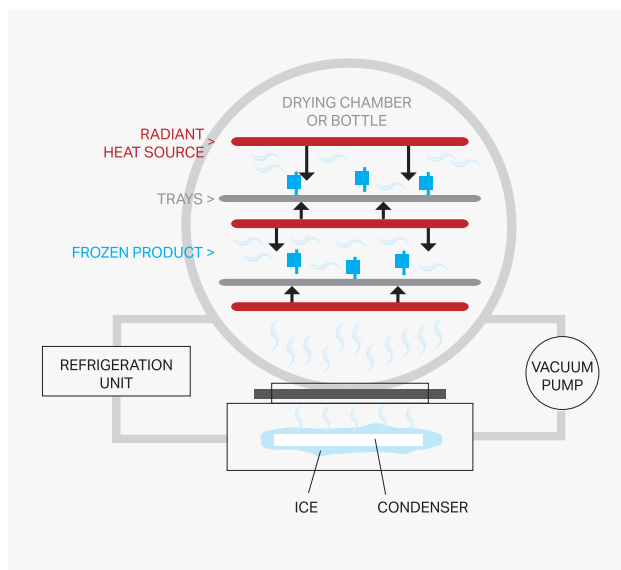


Typical Phase Diagram of Water

Technical Specifications

	HyperCOOL HC3055	HyperCOOL HC3110	HyperCOOL HC8080
Ultimate Chamber Temp (at RT) (°C)	-55	-110	-80
Chamber Volume (L)	4		25
Trap (Chamber) Size (Ø x L)	165 x 202		305 x 355
ICE Condensing Capacity (kg)	3		8
Ice condensing performance (kg/day)	2.5		3
Digital Readout	Time, Temperature, Vacuum Pressure		
Function	KEYLOCK, DEFROST, VACUUM, TIME		DEFROST, VACUUM, TIME
Built in Vacuum Pump	No		Yes
Power supply	AC 230 V, 50 Hz (AC 220-230 V, 50/60 Hz; 110 V optional)		
Power Requirement (KVA)	2 KVA	2.5 KVA	5 KVA
Dimension (W x D x H, mm)	400 x 660 x 570		710 x 610 x 960
Weight (kg)	58	72	195
Cat. No.	Hyper-HC3055	Hyper-HC3110	Hyper-HC8080
CE Mark	Yes	Yes	Yes





Fully Teflon coated condenser chamber and top plate provides consistent resistance against aggressive solvents and acids.



Hot-gas de-ice function of chamber heating makes fast ice removal.



Diverse sample containers can be used both in the chamber plate and flasks through manifold tree with 3/4 inch rubber valves.

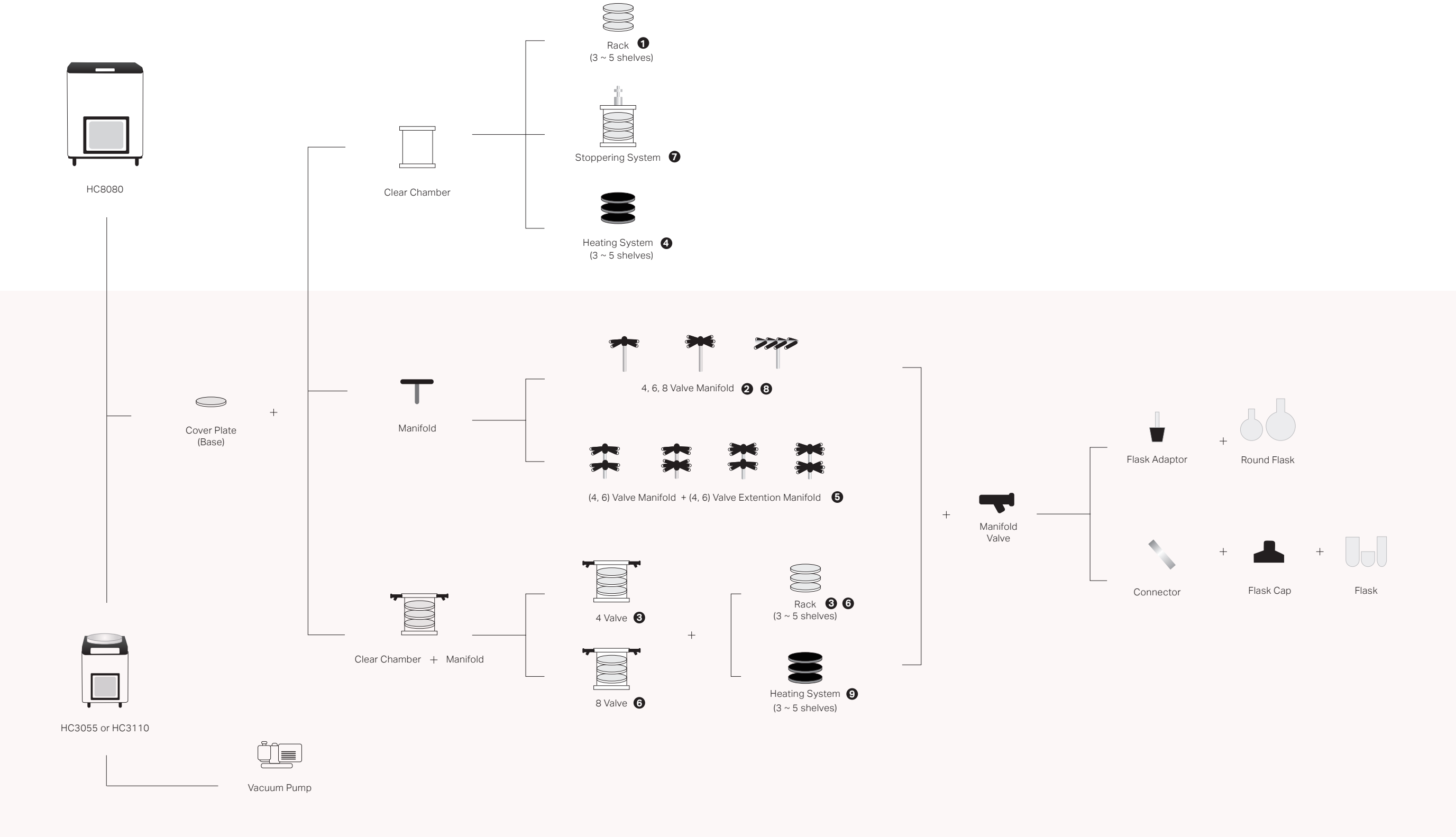


Front installed condenser pins are easily de-dusted by detaching a magnet door.



A screw capped drainage in the front body for easy and quick cleaning.

HyperCool Freeze Dry System Configuration



Can be configured with HyperVAc (Lite / Max) for mlti-purpose (Cold trap freeze drying)

HyperCool (Freeze Drying) Configuration

HyperCool (3055, 3110) needs to be configured with Rotary Vane Pump (GVP-W2V20)

**1** Basic Chamber

HyperCool (3055, 3110, 8080) + Acrylic Base + Stainless Steel Rack (3~5 shelves) + Acrylic Chamber

**2** Basic Manifold (4,6)

HyperCool (3055, 3110, 8080) + Acrylic Base + Basic Manifold (4,6)

**3** Acrylic Chamber with Rubber Valve (4)

HyperCool (3055, 3110, 8080) + Acrylic Base + Acrylic Chamber with Rubber Valve (4) + Stainless Steel Rack (3~5 shelves)

**4** Heating Chamber

HyperCool (3055, 3110, 8080) + Heating Rack (Base included) (3~5 shelves) + Acrylic Chamber

**5** 2 Step Manifold

HyperCool (3055, 3110, 8080) + Acrylic Base + Basic Manifold (4, 6) valve extendable with (4, 6) valve regardless of basic Manifold

**6** Acrylic Chamber with Rubber Valve (8)

HyperCool (3055, 3110, 8080) + Acrylic Base + Acrylic Chamber with Rubber Valve (8) + Stainless Steel Rack (3~5 shelves)

**7** Stoppering Chamber

HyperCool (3055, 3110, 8080) + Acrylic Base + Stoppering Rack + Stoppering Acrylic Chamber

**8** Basic Manifold (8)

HyperCool (3055, 3110, 8080) + Acrylic Base + Basic Manifold (8)

**9** Acrylic Chamber with Rubber Valve (4, 8) (Heating)

HyperCool (3055, 3110, 8080) + Acrylic Chamber with Rubber Valve (4, 8) + Heating Rack (3~5 shelves)

HyperVAC (Centrifugal Concentration) Configuration



① Drip Catcher (Ice Temperature), Water Pump

HyperVAC (LITE, MAX) + Drip Catcher + Water Pump



② Drip Catcher (Ice Temperature), Diaphragm pump

HyperVAC (LITE, MAX) + Drip Catcher + Diaphragm Pump



③ Cold Trap (-55°C, -110°C), Rotary Vane Pump, Table A

HyperVAC (LITE, MAX) + HyperCool (-55°C, -110°C) + Acrylic Base
Rotary Vane Pump. Table A (HyperCool underneath, Vacuum pump in the back)



④ Cold Trap (-55°C, -110°C), Rotary Vane Pump, Table B

HyperVAC (LITE, MAX) + HyperCool (-55°C, -110°C) + Acrylic Base
Rotary Vane Pump. Table B (HyperCool side, Vacuum Pump underneath)

Multi-Purpose Configuration (Centrifugal Concentration + Freeze Drying)

Only HyperCool (3055, 3110) applicable to Multi-Purpose Configuration*



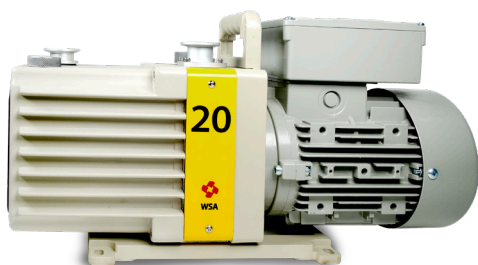
Centrifugal Concentration + Freeze Drying (Manifold)

HyperVAC (LITE, MAX) + configuration (p.157 2, 5, 8) + Table B



Centrifugal Concentration + Freeze Drying (Acrylic Chamber + Rubber
Valve + Stainless Steel Rack / Heating Rack)

HyperVAC (LITE, MAX) + configuration (p.157 3, 6, 9) + Table B



Rotary Vane Pump

Configured with Hyper Cool (3055, 3110), the ultimate pressure of the Rotary Vane Pump keeps the solvents frozen during lyophilization (freeze drying) at 1.3×10^{-1} Pa. Low noise and low vibration offers a comfortable working environment. Simple structure, Easy to use and maintain.

CAT. NO.		GVP-W2V20
Pumping Speed		200 L/min
Ultimate Pressure (Torr)	Gas Ballast Close	$\leq 1 \times 10^{-3}$ (1.3×10^{-1} Pa)
	Gas Ballast Open	5×10^{-2} (6.7 Pa)
Motor Speed		1,700 rpm
Oil Capacity		600 cc (0.6 L)
Weight		23.3 kg
Overall Dimension (W x L x H)		150 mm X 423 mm X 250 mm



Diaphragm Pump

Configured with Hyper VAC (Max, LITE) All parts in contact with the sample are made of aluminum and selected plastics allowing a wide range of applications for non-corrosive gases. The highly flexible fabric-reinforced double diaphragm made of FKM extends the lifespan of the pump.

CAT. NO.		GVP-MP001
Pumping Speed		40 L/min
Ultimate Pressure (Torr)		5.2
Motor Speed (min-1)		1800
Weight		11 kg
Overall Dimension (W x L x H)		243 mm x 239 mm x 198 mm



Water Pump

Configured with Hyper VAC (MAX, LITE). The parts in contact with the sample solvent during concentration are made of polypropylene with excellent chemical resistance. Ideal for chemical concentration.

CAT. NO.		GVP-VE11
Pumping Speed		18L / min x 2EA
Ultimate Pressure (Torr)		748.56
Motor Speed		150W
Weight		5.7 kg
Overall Dimension (W x L x H)		330 mm x 265 mm x 390 mm

Cover Plates for HyperCOOL

HHC-CPP

HC3055, HC3110 Trap Plate for Connection Vacuum Hose to Vacuum Concentrator



HHC-CPB

HC3055, HC3110 Acrylic Base for Manifold or Chamber



HHC-CPM

HC3055, HC3110 Acrylic Base for HHC-MFB-8V



HHC-CPP(8)

HC8080 Trap Plate for Connection Vacuum Hose to Vacuum Concentrator



HHC-CPB(8)

HC8080 Acrylic Base for Manifold or Chamber



HHC-CPM(8)

HC8080 Acrylic Base for HHC-MFB-8V



Manifolds for HyperCOOL

HHC-MFB-4V

Incl. 4 rubber valves on a stainless steel bar, 30 cm



HHC-MFB-6V

Incl. 6 rubber valves on a stainless steel bar, 30 cm



HHC-MFE-4V for extension

Incl. 4 rubber valves on a stainless steel bar, 20 cm



HHC-MFE-6V for extension

Incl. 6 rubber valves on a stainless steel bar, 20 cm



HHC-MFB-8V

Incl. 8 rubber valves on a stainless steel bar, 30 cm



Chambers for HyperCOOL

HHC-CH30P

Acrylic Chamber Trunk and Plain Top, ø30 cm, height 40 cm



HHC-CH30-4V

Acrylic Chamber Trunk and Top with 4 rubber valves, ø30 cm, height 40 cm



HHC-CH30-8V

Acrylic Chamber Trunk and Top with 8 Rubber Valves, ø30 cm, height 40 cm



Stoppering Assembly



Racks For HyperCOOL

HHC-CR25

Stainless Steel Rack with 3 sets of shelves and trays, ø25cm (Trays can be inserted up to 5)



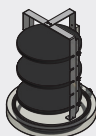
HHC-CR-TS

A Set of a Tray and a Shelf



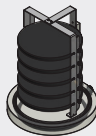
HC-HP6003

Heating Plate (basic 3 shelves)



HC-HP6005

Heating Plate (5 shelves)

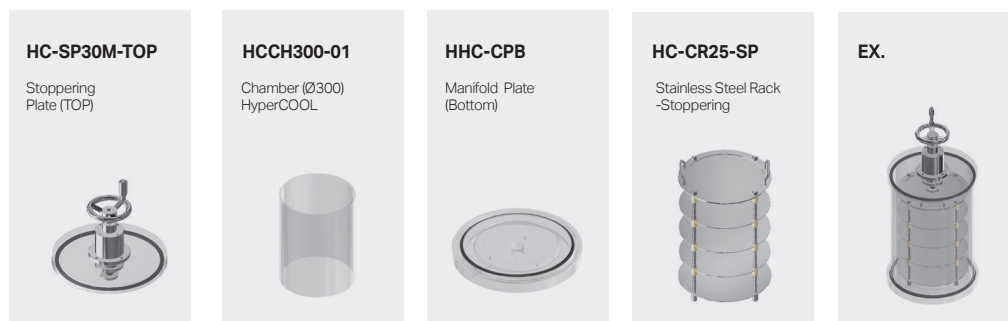


HC-HPS

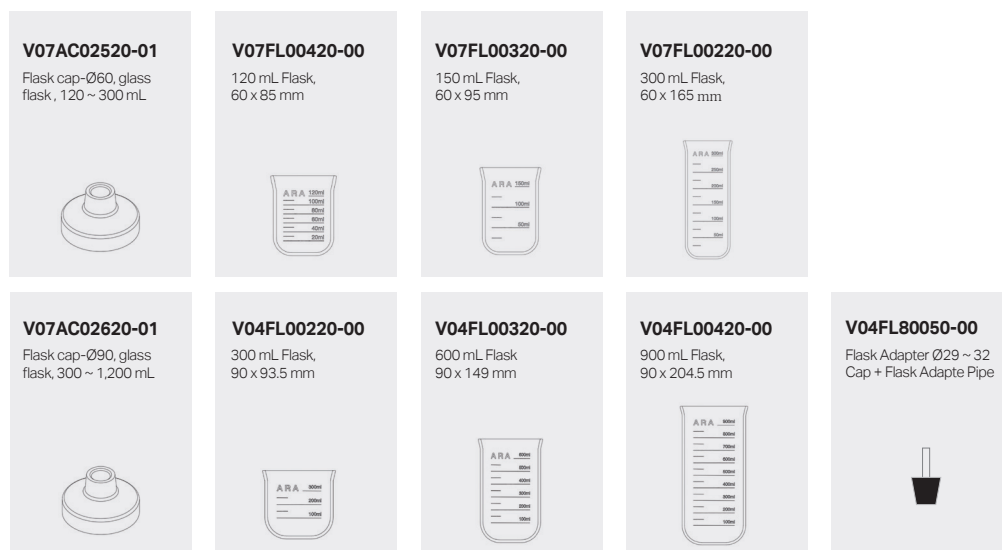
Heating Plate (1shelf for additional order)



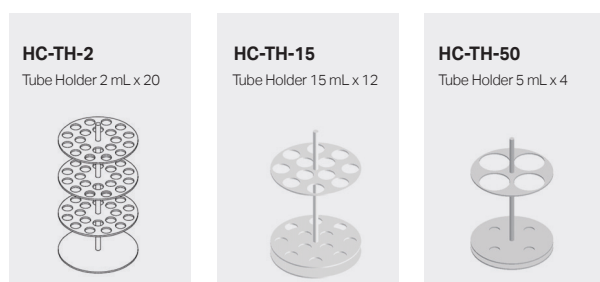
Stoppering Assembly



FD Glass Flasks



Tube Holder for 900, 1,200 mL Flasks



Ordering Infomation of ARA Glass Flasks

HC-AGF120	120 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 60 mm)
HC-AGF150	150 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 60 mm)
HC-AGF300	300 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 60 mm)
HC-AGF300W	300 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 90 mm)
HC-AGF600	600 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 90 mm)
HC-AGF900	900 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 90 mm)
HC-AGF1200	1,200 mL Flask+ Rubber Lid + Stainless Adaptor (Diameter 90 mm)
V04FL80050-00	Flask Adapter Ø29 ~ 32 Cap + Flask Adapter Pipe