BVS
BEYOND VALUABLE SOLUTION

cobetter®
filtration

Biophsep™
Hollow Fiber



www.bvskorea.com
02-548-6211



Product Features

- High flow rate, high filtration capacity
- Modified hydrophilic PES hollow fiber membrane provides low protein adsorption, less membrane fouling and easy cleaning
- Integrated device without additional assembly or device holder, quick installation and operation
- Re-washable with 0.5M NaOH solution
- Simple and reliable linear scale-up

Cobetter Biophsep™ hollow fiber with good filtration resolution and low fouling , helps biopharmaceutical customers to improve product yield and filtration load, and reduce production costs.

Typical Use by Application

- Purification, concentration and diafiltration of vaccine
- Purification, concentration and diafiltration of viral vector
- Clarification of cells and bacterial in fermentation broth
- Recycling and washing of cells and bacteria
- Concentration and diafiltration of protein

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Product Specification

Hollow Fiber Filter Module Part Number Description(0.5mm)

Module	Effective Length (cm)	Process Volume	MWCO	Fiber Inner Diameter (mm)	Effective Area (cm^2/m^2)	Fiber Number	Flow rate @2000s^{-1} (mL/min)	Flow rate @6000s^{-1} (mL/min)	Overall Dimension (mm*mm)	Inlet/ Outlet	Side Port
Mini	30	<300mL	3kD 5kD 10kD 30kD 50kD 100kD 300kD 500kD 750kD	0.5	28	6	9	27	10*346	Luer Connection Female	Luer Connection Female
	60	<600mL		0.5	56	6	9	27	10*646		
Minilab	30	<1L		0.5	118	25	37	110	10*346		
	60	<2L		0.5	236	25	37	110	10*646		
Lab	30	<2L		0.5	236	50	74	221	13*348	0.5'' TC (Disk Outer Diameter 25mm)	3/16'' HB
	60	<4L		0.5	471	50	74	221	13*648		
Lab+	30	<8L		0.5	0.08	180	265	794	18*355	0.5'' TC (Disk Outer Diameter 25mm)	3/8'' HB
	60	<16L		0.5	0.16	180	265	794	18*620		
Pilot	30	<15L		0.5	0.15	320	471	1413	33*361		
	60	<30L		0.5	0.30	320	471	1413	33*661		
	110	<50L		0.5	0.55	320	471	1413	33*1161		
Pilot+	30	<15L		0.5	0.24	500	736	2206	33*361	1.5'' TC (Disk Outer Diameter 50.5mm)	0.5'' TC (Disk Outer Diameter 25mm)
	60	<50L		0.5	0.47	500	736	2206	33*661		
	110	<80L		0.5	0.86	500	736	2206	33*1161		
MiniProcess	30	<75L		0.5	0.68	1450	2132	6397	47*400		
	60	<150L		0.5	1.37	1450	2132	6397	47*700		
	110	<250L		0.5	2.50	1450	2132	6397	47*1150		
MidProcess	30	<120L		0.5	1.22	2600	3824	11471	65*440		
	60	<200L		0.5	2.45	2600	3824	11471	65*740		
	110	<400L		0.5	4.29	2600	3824	11471	65*1190	1.5'' TC (Disk Outer Diameter 50.5mm)	1.0'' TC (Disk Outer Diameter 50.5mm)
Process	30	<200L		0.5	2.45	5200	7647	22941	89*477		
	60	<500L		0.5	4.90	5200	7647	22941	89*777		
	110	<800L		0.5	8.57	5200	7647	22941	89*1227		
Maxi	60	<800L		0.5	9.29	10200	15000	45000	117*760	2.0'' TC (Disk Outer Diameter 64mm)	1.5'' TC (Disk Outer Diameter 50.5mm)
	110	<1500L		0.5	16.81	10200	15000	45000	117*1230		

HF-E-XX-XXXX-XX-XX-P e.g.: HFELA05000560P

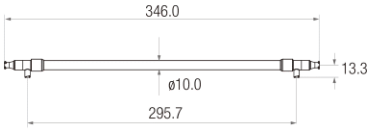
Product type	Membrane	Module	MWCO	Fiber Inner Lumen	Effective Length	
HF Hollow Fiber	E PES	MN Mini	0003 3kD	05 0.5mm	30 30cm	P Pharmaceutical
		MI Minilab	0005 5kD	10 1.0mm	60 60cm	
		LA Lab	0010 10kD		11 110cm	
		LP Lab+	0030 30kD			
		PI Pilot	0050 50kD			
		PP Pilot+	0100 100kD			
		MP Miniprocess	0300 300kD			
		DP Midprocess	0500 500kD			
		PR Process	0750 750kD			
		MA Maxi				

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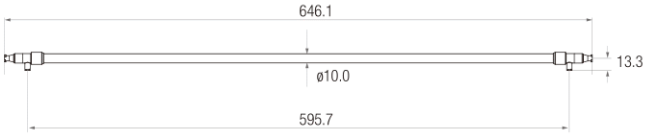
Material Construction

Module Component	Material	Advantages and Functions
Hollow Fiber Membrane	mPES	The modified hydrophilic PES hollow fiber membrane features low adsorption, less membrane fouling and continuous high flow rate for faster processing time, the membrane is proved to effectively retain virus particles so as to achieve the purpose of concentration and buffer exchange.
Potting Glue	Polyurethane/Epoxy	Potting glue wraps each hollow fiber to provide support for the hollow fiber membrane, and at the same time completely separates the inlet flow channel and the permeate flow channel.
End Cap	White Polysulfone	Flow channel connection for liquid in and out, with good chemical compatibility.
Shell	Transparent Polysulfone	Connect the inlet and outlet caps to form an integrated assembly, while providing a flow channel for the permeate, with good chemical compatibility.

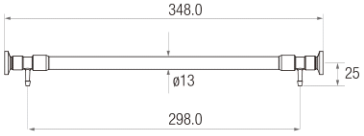
Overall Dimension



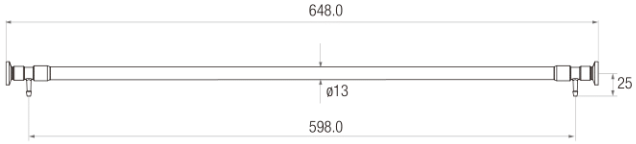
MI-Minilab -30cm



MI-Minilab-60cm



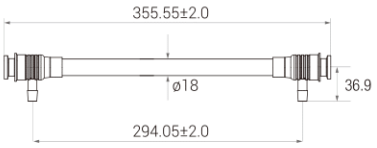
Lab-30cm



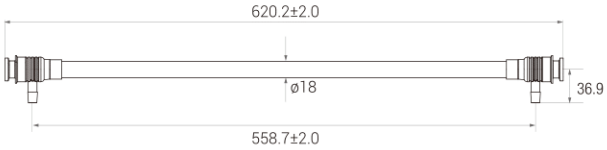
Lab-60cm

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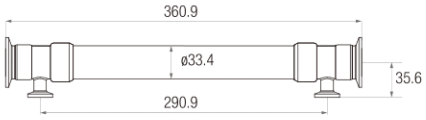
Overall Dimension



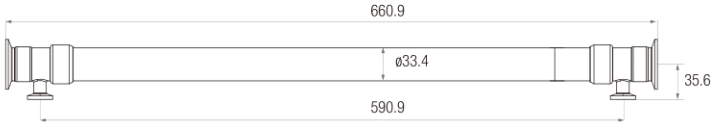
Lab⁺-30cm



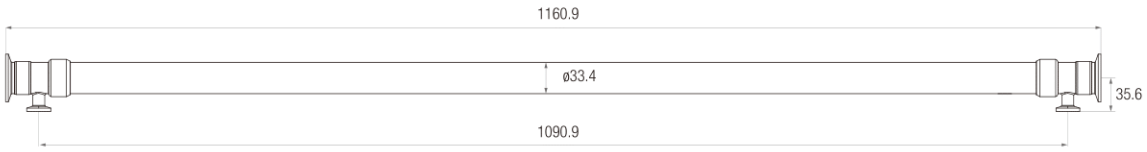
Lab⁺-60cm



Pilot / Pilot⁺
30cm

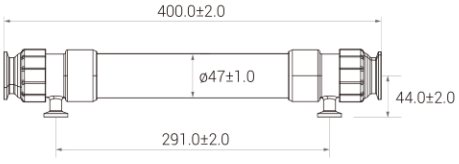


Pilot / Pilot⁺
60cm

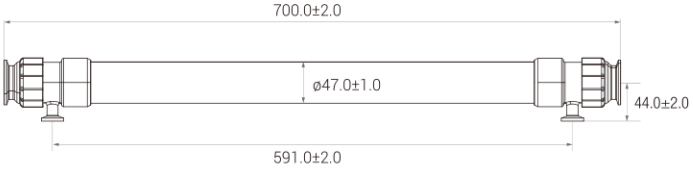


Pilot / Pilot⁺
110cm

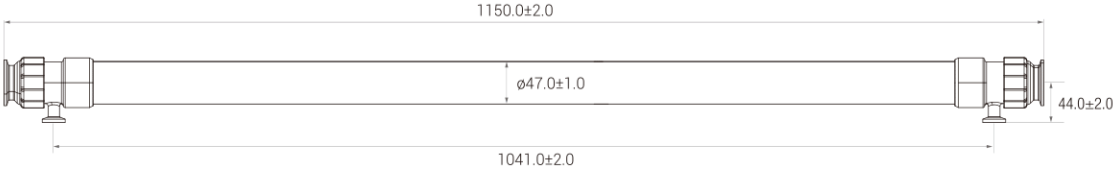
Overall Dimension



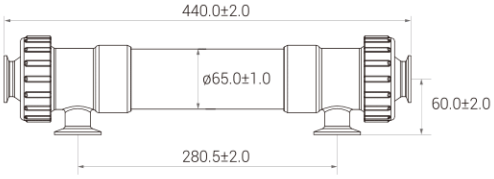
Mini-Process 30cm



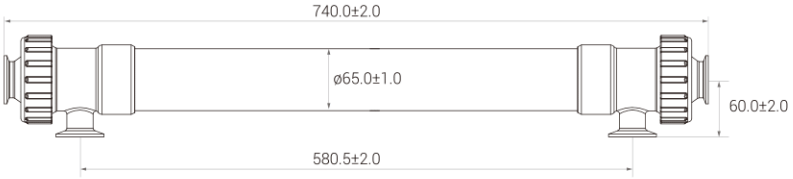
Mini-Process 60cm



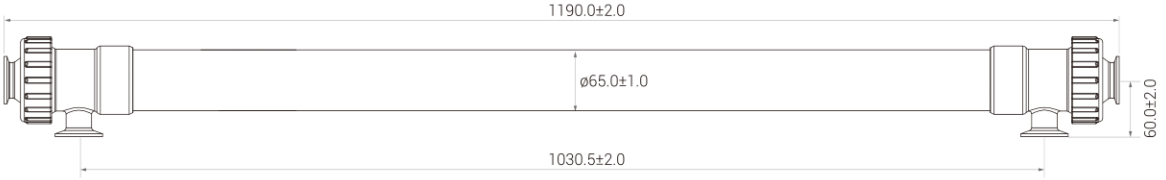
Mini-Process 110cm



Mid-Process 30cm

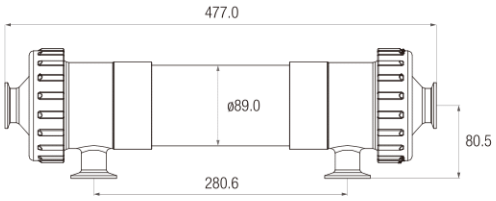


Mid-Process 60cm

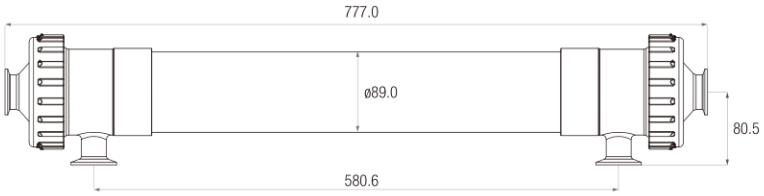


Mid-Process 110cm

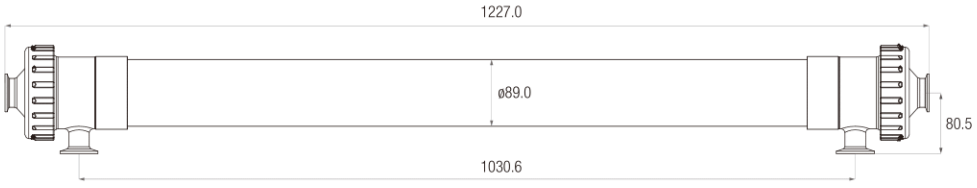
Overall Dimension



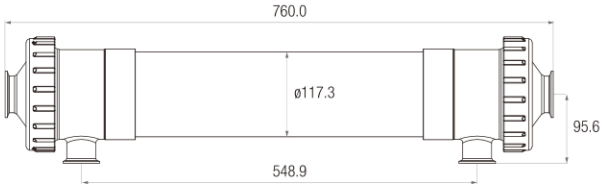
Process 30cm



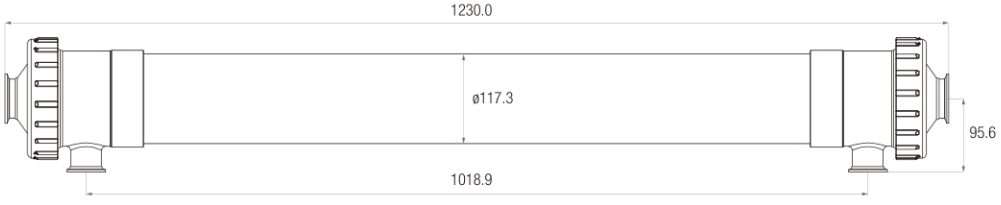
Process 60cm



Process 110cm



Maxi 60cm



Max 110cm

Key Figures

Shear Rate

The circulating flow rate of the hollow fiber depends on the product tolerance to the shear rate, in generally it will be set at 2000/s to 10000/s, which is much smaller than the shear rate generated by the turbulent flow on the surface of the cassette screen.

For general materials, we usually choose a shear rate of 4000/s to 6000/s;

If the product is sensitive to shear force (such as lentivirus, coronavirus or macromolecular protein expressed by animal cells, large plasmids and LNP, etc.), the shear rate needs to be reduced to 2000/s;

If the product is with good resistance to shear force (such as small molecular proteins expressed by bacteria, etc.) shear rate could be increased to 8000/s to 10000/s.

Fiber Inner Lumen

Module with fiber of 1.0mm ID is ideal for product with high cell density or high solid content or high viscosity.

Module with fiber of 0.5mm ID is widely used in most application scenarios to improve mass transfer efficiency.

Only module with fiber of 1.0mm ID is autoclavable, as steam cannot enter the fiber of 0.5mm ID effectively.

MWCO

Sufficient separation efficiency and the risks of fouling should both be taken into consideration when choosing MWCO.

To minimize the risk of fouling that inevitably occurs during membrane processing, it is advisable to choose membranes with relatively smaller pore sizes, as long as the separation efficiency and flux are maintained. This helps reduce the intrusion of impurity particles into the membrane pores, thus extending the membrane's service life.

Common processing scenarios are as following:
· Heat source removal of small molecule in Chinese medicines : 5kD, 10kD
· Ultrafiltration and concentration of mABs, buffer exchange : 30kD, 50kD
· Concentration, purification and removal of virus : 100kD, 300kD, 500kD, 750kD
· Clarification of recombinant protein, antibody : 500kD, 750kD
· Concentration for bacteria: 500kD, 750kD
· Clarification of lysate: 0.2μm, 0.45μm, 0.65μm

Effective Length

The process scale-up feature of hollow fibers is that: direct process scale-up can be carried out as long as the effective length is kept the same.

On the opposite, due to the significant pressure drop difference between inlet and outlet existed in different lengths, the internal pressure and flow velocity distribution of the flow channel also change correspondingly, so linear scale-up can not be performed on devices with different length. When processing with more fouling and high viscosity product, it is preferred to choose module with shorter length.



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