



- ARTEMIS has developed and patented a “universal” tubular membrane module (VHU®) for the continuous harvesting of viral vectors, VLPs, monoclonal antibodies, recombinant proteins, etc.
- VHU® modules are single use.
- VHU® modules are connected to a bioreactor by sterile connections which comply with all pharmaceutical requirements.
- Retraceability of installed materials
- PS/PC: USPVI quality polycarbonate and polysulfone.

- A variety of module sizes accommodates a wide variety of applications for the production of viral vectors.
- The VHU® module is provided as sterile by gamma radiation (25kGa-40kGa).
- The VHU® module is also provided with CPC connectors (e.g. AQG 33012) for “plug&play”.
- All fluid path materials of construction meet USP Class VI requirements and do not contain any substances derived from animal products or are compliant with EMEA 410/01.
- All materials of construction are 100% lot traceable.

Operating Conditions

Type	VHU®0.3	VHU®1 (VHU®1L)	VHU®2	VHU®3L
Membrane Surface Area (cm ²)	30	100	300	5000
Length (cm) Diameter ID (mm)	20 6	60 (30) 6 (13)	60 6	90 13
Pump Rate (Recommended Nominal Max-Min (LPM))	0.1-0.3	0.1-0.3	0.3-1	1-10
Permeate Flowrate (mL/min)	0.1-1	0.1-1	1-20	10-100
Pressure Drop (TMP)	<10 psi	<10 psi	<10 psi	<10 psi



Parameter	Specification		
Scalable	1L-1000L		
Preferred	Single Use and Sterile Connectors		
Pump	Levitronix i30, i100, i600 Single Use Pumps		
Bioreactor	Bioreactor with a bottom port		
Range of Operation	1x10 ⁶ -80x10 ⁶ cells/mL		
Robust	Continuous Operation for 1 week		
Cell Retention	>99%		
LV Recovery	>99%		
Parameter	Results		
Pool Volume VHU®1L	1L		
Yield	>99%		
Titer	1.3 x 10 ⁸ TU/mL		
Turbidity	<10 NTU		
NTU reduction	96.8%		
Process Time	1.5 hours		
Process Mode	Turbidity (NTU)		
	Broth	Post-Harvest	Clarified
Batch	50-90	N/A	Target: ~5
VHU® Perfusion	~500	<10	N/A

Type	VHU®0.3	VHU®1 (VHU®1L)	VHU®2	VHU®3
Hydraulic Connections				
Retentate ID (in)	1/4"	1/4"	1/2"	3/4"
Permeate ID (in)	1/4"	1/4"	3/8"	1/2"
Recommended Length of tubing return to SUB	<10"	<10"	<20"	<40"