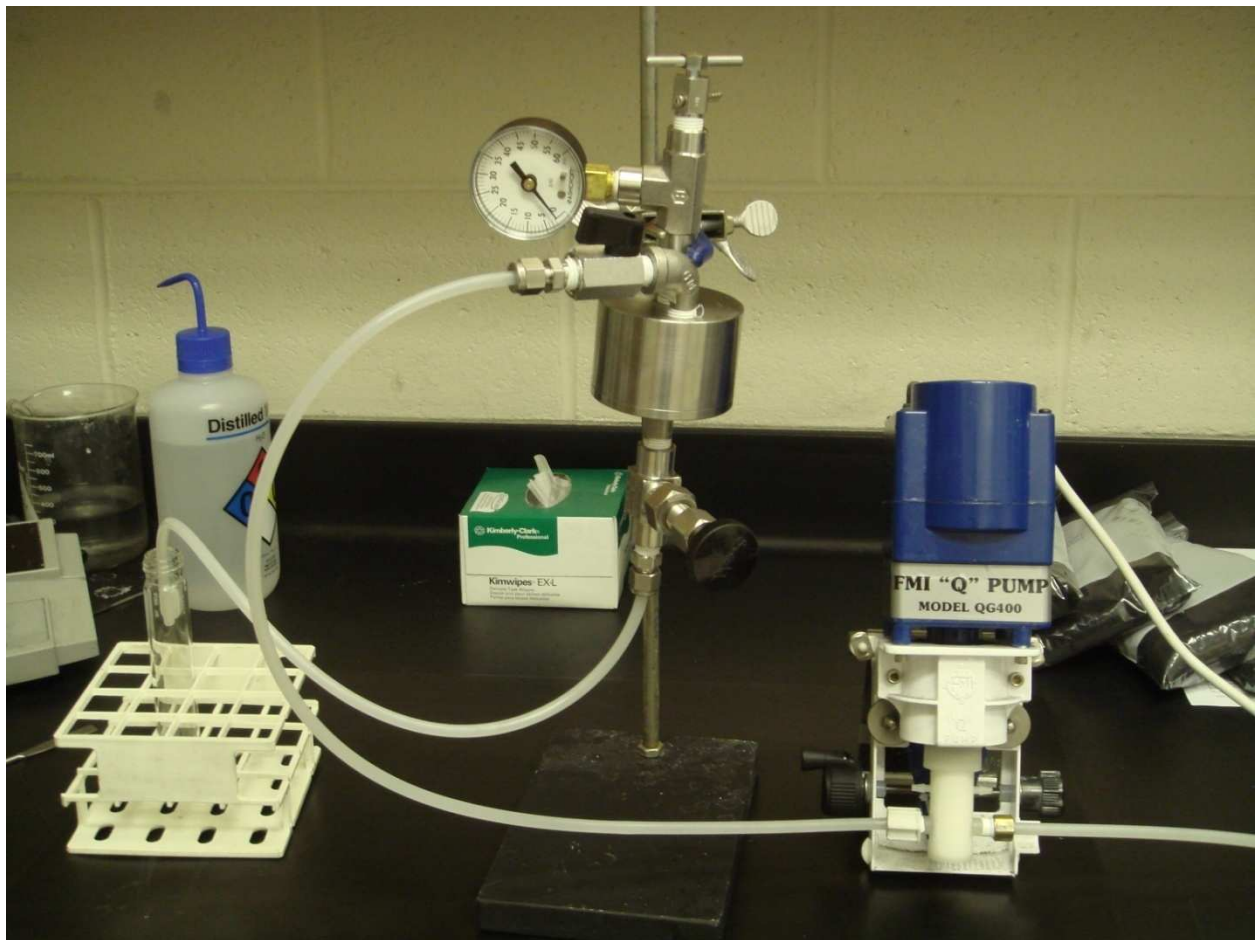




Graver Technologies

E-PAK® PHARMA Cartridge Assembly & Operating Instructions



Parts List

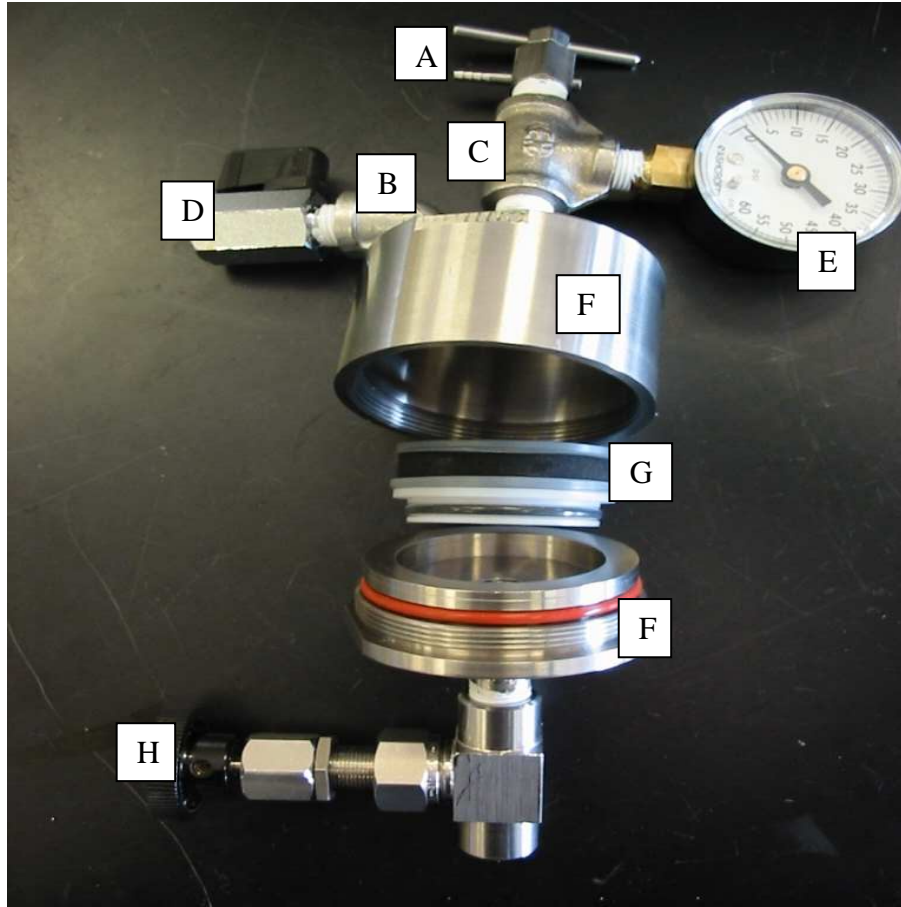







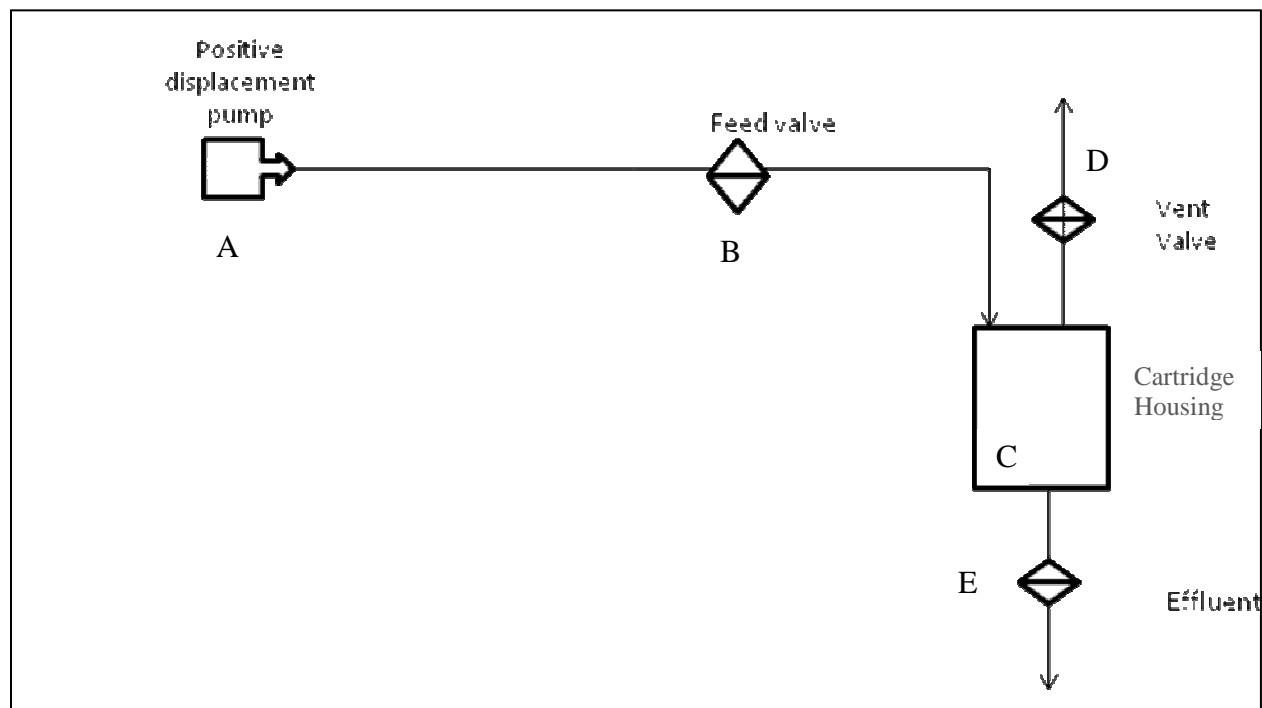


Photo	Item	Description	Part Number
	A	Vent Valve	SSBVM4C3SH
	B	Elbow	EM4464K360
	C	Tee with Nipple	EM4452K432 (Tee) EM4548K132 (Nipple)
	D	Feed Valve	EM4912K720
	E	Pressure Gauge	EM4089K130
	F/G	Housing Assembly/Cartridge/o-Ring	ELBK0000SS (Housing)
	H	Effluent Valve with Nipple	SSBVM4C3SH (Valve) EM4548K132 (Nipple)

OPERATION / INSTRUCTIONS

Positive Displacement Pump Feed System

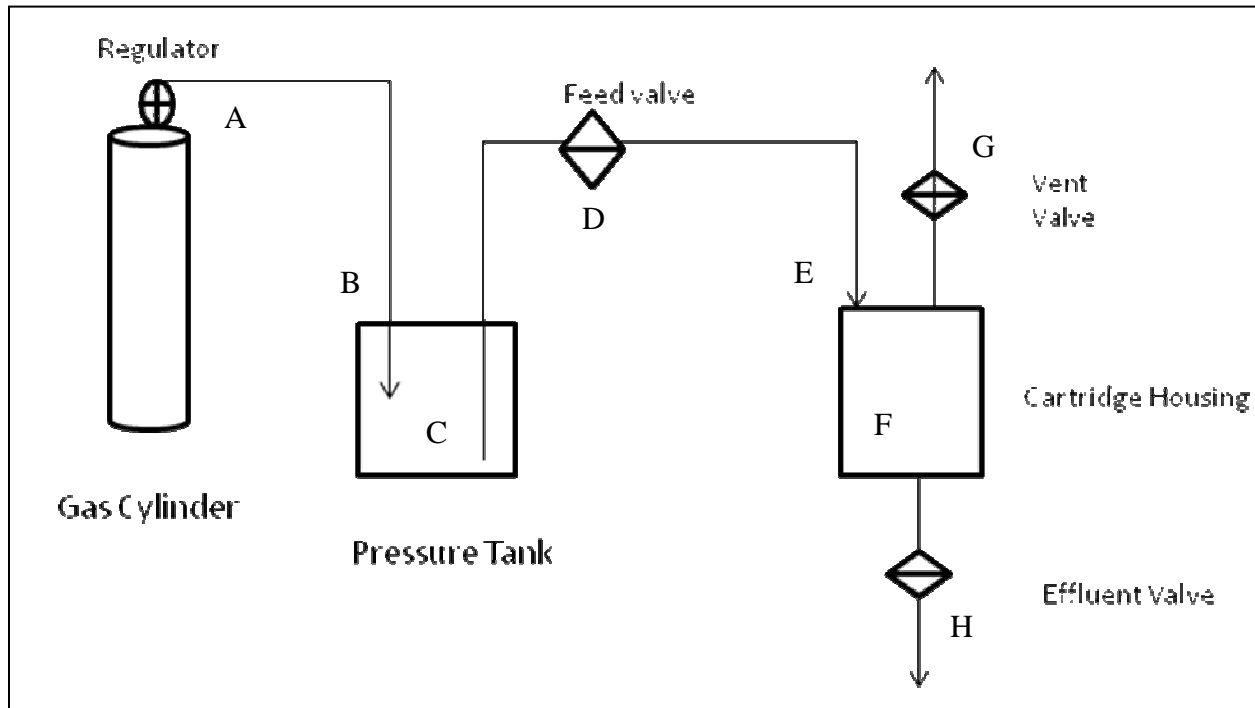


- Wet the o-ring on the test cartridge with methanol, and place the cartridge into the housing. Use gentle pressure and twist the cartridge as it is pushed into the base of the housing.
- Hand-tighten the two halves of the housing together.
- Attach the outlet of the pump (A) to the inlet valve on the cartridge housing (C).
- Hang the housing upright with a ring stand.
- Open both the feed valve (B) and the vent valve (D).
- Close the effluent needle valve (E) located under the housing (C).
- Start the pump (A). As soon as the feed liquid begins to exit the vent valve (D), open the effluent valve (E) and then close the vent valve (D). **Do not** close the vent valve (D) before opening the effluent valve (E) or you will over-pressurize the system.
- Adjust the effluent needle valve (E) to achieve the required flow rate/contact time. The table below provides flow / contact time information.
- Collect samples for analysis to determine the breakthrough point and the percent loading. We recommend sampling at 15-minute intervals.

Contact Time v. Flow Rate

Flow Rate (ml/min)	Contact Time (min)
3.5	4.3
4.5	3.3
5.5	2.7
6.5	2.3
7.5	2.0
8.5	1.8

Pressure Vessel Feed System



- Wet the o-ring on the test cartridge with methanol, and place the cartridge into the housing (F). Use gentle pressure and twist the cartridge as it is pushed into the base of the housing.
- Hand-tighten the two halves of the housing (F) together.
- Hang the housing upright with a ring stand.
- Connect the outlet of the pressure tank (C) to the inlet of the housing (F).
- Close the effluent valve (H) located under the housing (F).
- Close the feed valve (D).
- Close the vent valve (G) located at the top of the housing.
- Pressurize the pressure tank (C) to 10 psig using the gas regulator (A).
- Open the feed valve (D) then slowly open the vent valve (G) to allow gas to escape. When fluid exits from the vent valve (G) close same.
- Open the effluent needle valve (H) and adjust the valve to obtain desired flow rate.
- Collect samples for analysis to determine the breakthrough point and the percent loading. We recommend sampling at 15-minute intervals.
- Use the table above to establish desired flow rate/contact time.

For more information

Graver Technologies Customer Service: 1-888-353-0303

Technical Support: 1-800-510-0932, outside the USA: 302-731-1700

E-Mail us at info@gravertech.com