

Q & A

1. Vessel (how big and what material.. who made it?)

My actual cylinder is made by ACE Glass (www.aceglass.com). It is 24" long and 2.5" od, 3/8" wall. The plan was for a shorter and wider one, but this shape is ideal for demonstrating the structure of the discharge. All the dark spaces show up beautifully! Also with the movable electrode you can show how the striations don't show up at all for shorter lengths, which spaces stay, which disappear. It is very important to have the proper flanges. For a plastic chamber, plastic grooved flanges with gaskets and o-rings will work. ACE Glass specializes in threaded connections so they have the standard end flanges to go with my cylinder which I bought. They are rather expensive at \$100 for a pair, but easy to drill. I had a professional mechanic do all the drilling because it has to be done very clean without splinters for a good vacuum connection.

2. Flow meters? (I am hoping to be able to introduce different gasses into my vessel)

I am not using flow meters. I have a shut-off valve and a needle valve. The needle valve is what makes the greatest difference. It controls the flow accurately so that you can maintain stable pressure at a desired level.

3. Pressure gauges (how many, what kind, how much \$?)

You need one pressure gauge. Since I was trying to use various used stuff that tended to break, I've tried baratron gauge, thermocouple gauge, and something else I can't remember. All work fine when they do. Just make sure you have the right range, down to about 50 mTorr. Pirany gauge, thermocouple gauge, or baratron gauge will work fine, just make sure they are designed for the right pressure range. You need about 40% wider range than you'll use to prevent accidental damage.

4. Connection tubing (I suspect there is some type of low pressure tubing for this type of thing. Where did you get it? how much?)

You can use any tubing really, copper, stainless, teflon, silicon... Depends on whether the system is going to be movable or stationary. In my system, I use teflon 1/8" tubing for gas and silicon 3/8" for vacuum. The size of my vacuum tubing was determined by the space available on the end flange.

5. What else am I missing?

You have to make sure everything is well insulated. I managed to shock

Andrew because the discharge jumped from the electrode to the gas line outside of the chamber. Anyway, any solid insulation on the outside will work fine. Also, I have a plexi cover over the whole system that extends far enough to cover the movable electrode when it is fully extended. I actually think it is the greatest thing about my whole system!

6. I am buying a power supply from Daedalion (0-1000 dc @ 10ma) and an alcatel pump.. I think we talked about that before.

Alcatels are great!!

Also, have you ever used the Daedalion spectrophotometer? It lists for about \$2,225 (ouch) but I've heard good things about them.

7. Any advice you have will be greatly appreciated.

Gas. Buy the small bottles, the cylinders require a rental fee for the cylinder itself in addition to paying for the gas.

Budget

Item	<i>Price</i>
3" ID-24"long-2.65liter-glass cylinder	326
2 nylon end caps, predrilled for fittings	110
2 end fittings	40
fittings for gas inlet, vacuum outlet, needle valve	60
electrical feedthrough	50
disc and cylindrical electrodes	200
stand for the chamber	50
mechanical vacuum pump	900
power supply, 3,000 V, 0.25 mA	1100
gas cylinders, Ar, Ne, He	164
TOTAL COST	3000