I'M NOT GETTING ANY CHARGE!

MODEL N-100V VAN DE GRAAFF GENERATOR

When two dissimilar materials are separated, there may be a preferential transfer of electrons from one to the other leaving each with a charge, one positive and one negative. With a Van de Graaff this occurs when the rotating belt separates from the lower wool covered pulley and starts up toward the dome. The negative charge remains stationary on the insulating rubber belt and when it reaches up the upper pulley, that pulley begins to acquire a charge. Some materials give up electrons easily (wool), while other materials gladly accept additional electrons (PVC). When the charge on the upper pulley is sufficient, there will be an electron flow across the air gap to the upper brush electrode and thence out onto the surface of the dome. More about brush position a little later.

When you do not get any charging action, there are a number of possible causes. One of the first hurdles to get past is the current level of humidity and its effect on the belt and the lower pulley. The wool will absorb moisture over time and may need to be dried with an ordinary home hair dryer. To do this, remove the base of the cabinet and lay the machine on its side. Remove the belt from the lower pulley and blow on the wool for fifteen - twenty seconds while running at low speed. Be careful not to overheat.

If the belt is old (more than one year) it may be oxidized on the surface and must be replaced with one that is young in age. Not an unused one that has been on the shelf for several years. If the belt is not old, it may have a small amount of moisture on its surface or absorbed into the light coating of talcum powder. It can be revived by putting a small amount of fresh talcum powder in a plastic bag along with the belt. Shake it until it is completely coated. The purpose of the talcum is to absorb any moisture - then get rid of it.

When these things have been done, we can turn our attention to the upper and lower brushes. Both should be positioned with points or ends of the wires pointing directly at the belt (perpendicular), leaving an air gap of about 405 mm. Putting them closer does not improve performance - it only increases the chance of snagging the belt or scratching a pulley. They only need to be close enough to perform their function, that of creating an air gap. Note that the charge level on the dome is primarily a function of how many and how fast are electrons being brought up on the belt. In normal operation the pulleys should last for many years. If, however the wool has worn away on the lower pulley or the coating on the upper pulley is embedded with grime and rubber particles they should be replaced.

Replacement parts are available on our website at www.winsco.com >> electrostatics >> Van de Graaff

Wabash Instrument Corporation 300 Olive St., Wabash, IN 46992 Tel: 260.563.8406 www.winsco.com
For more information, please contact us: info@winsco.com