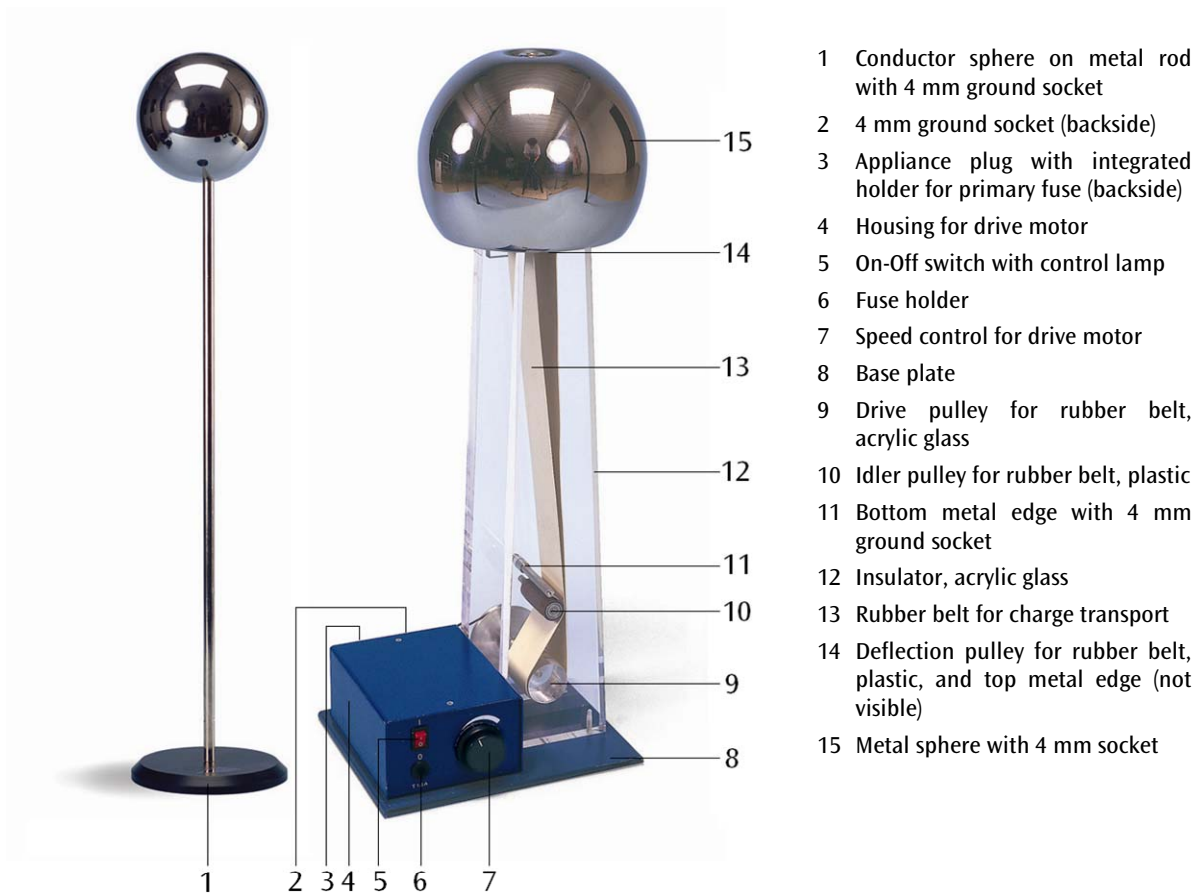


Van de Graaff Generator with Discharge Electrode (115 V, 50/60 Hz) Van de Graaff Generator with Discharge Electrode (230 V, 50/60 Hz)

1002963 / U15300-115
1002964 / U15300-230

Instruction Sheet

04/12 Alf



- 1 Conductor sphere on metal rod with 4 mm ground socket
- 2 4 mm ground socket (backside)
- 3 Appliance plug with integrated holder for primary fuse (backside)
- 4 Housing for drive motor
- 5 On-Off switch with control lamp
- 6 Fuse holder
- 7 Speed control for drive motor
- 8 Base plate
- 9 Drive pulley for rubber belt, acrylic glass
- 10 Idler pulley for rubber belt, plastic
- 11 Bottom metal edge with 4 mm ground socket
- 12 Insulator, acrylic glass
- 13 Rubber belt for charge transport
- 14 Deflection pulley for rubber belt, plastic, and top metal edge (not visible)
- 15 Metal sphere with 4 mm socket

1. Safety instructions

Caution! Sensitive electronic equipment can be damaged by voltage flashovers.

- Persons who are at risk (e.g. those with heart pacemakers) may not stand close to the equipment when it is in operation.
- Do not use Van der Graaff generators near electronic equipment such as computers, digital meters etc..

The way the equipment operates can cause unavoidable HF interference

- Avoid using for inordinately long periods of time.
- Do not use leads of longer than 1 m for the required connections.
- Before using the Van de Graaff generator for the first time, confirm that the specifications printed on the rear side of the housing are compatible with the local mains voltage.

- Only use in dry rooms where there is no risk of explosion.
- Do not operate the machine if there is any visible damage.
- The instrument may only be connected to the mains via a socket that has an earth connection.
- Assemble circuits completely before switching on the Van de Graaff generator.
- Do not touch the circuits while running the generator.
- Replace a faulty fuse only with one matching the specifications stated at the rear of the housing.
- Disconnect the equipment from the mains before replacing a fuse.
- Never short the fuse or the fuse holder.

2. Description

The Van de Graaff generator serves as a electrostatic charge generator for high DC voltages (up to 100 kV if the experimental conditions are ideal) with low current (not contact hazardous) for numerous experiments in the area of electrostatics.

The Van de Graaff generator is made up of a base plate on which the drive motor with controllable speed and the acrylic glass insulator are mounted. The detachable metal sphere with 4 mm socket, for tapping voltage, is mounted on the insulator. The rubber belt runs between the drive pulley and the deflection pulley. The deflection pulley and the top metal edge are height adjustable (only required for retensioning the rubber belt). The metal edge is connected to the metal rod on which the sphere is mounted. The idler pulley and the bottom metal edge with 4-mm socket are located above the drive pulley. The conductor sphere on metal rod is used to demonstrate the flashover.

The Van de Graaff Generator 1002963 / U15300-115 is for operation with a mains voltage of 115 V ($\pm 10\%$), and the 1002964 / U15300-230 unit is for operation with a mains voltage of 230 V ($\pm 10\%$).

3. Equipment supplied

- 1 Van de Graaff generator
- 1 Conductor sphere on rod
- 1 Mains power lead
- 1 Dust cover

4. Spare parts

Rubber Belt for Van de Graaff Generator	1002965 / U15301
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5. Technical data

Voltage:	up to approx. 100 kV
Short circuit current:	15 μ A
Drive motor:	
Mains connection:	115 V, 50/60 Hz resp. 230 V, 50/60 Hz
Power consumption:	13 VA
Primary protection:	fuse T 160 mA
Dimensions:	
Generator:	240 x 190 x 620 mm ³
Metal sphere:	190 mm dia.
Conductor:	90 mm dia.
Height:	460 mm
Weight:	
Generator:	5.8 kg
Conductor:	0.5 kg

6. Operation

6.1 General information

The performance of a Van der Graaff generator can be adversely affected by humidity, sudden temperature fluctuations (precipitation) or dirt. To keep the machine working properly, all dirt (dust or grease, e.g. fingerprints) must be removed from the side walls, the spheres, the rollers and the rubber belt.

- Before switching on the Van de Graaff generator remove the metal sphere by lifting it straight up.
- Clean the surface of the pulleys with warm water and some dish washing liquid and dry them thoroughly (with a hair dryer). Never use solvents.
- Align the metal edges as shown in Fig. 1. Position them as close to the belt as possible without touching it.
- Put the metal sphere back on.
- Ground the sockets at the bottom metal edge and the conductor.
- Switch on the drive motor and choose the drive speed.
- Move the conductor slowly to the metal sphere to demonstrate charge balancing across a spark gap.
- In case of high humidity dry the Van de Graaff generator with warm air (hair dryer).

6.2 Replacing the primary fuse

- Pull the mains plug.
- Pry out the insert with holder for the primary fuse and spare fuse with a broad screw driver.
- Check the data plate on base plate and replace defective fuse using the spare fuse in the holder.
- Place a new fuse in the holder for the spare fuse.
- Put the insert back into its place.

6.3 Retensioning the rubber belt

- Remove the metal sphere by lifting it straight up.
- Loosen Phillips-head screws and retension the rubber belt by moving the bracket for the deflection pulley.
- Retighten the screws, align the metal edges and mount the metal sphere.

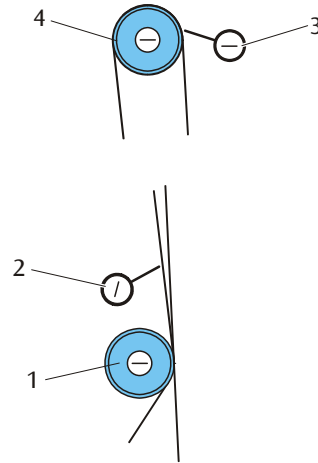


Fig.1 Positioning the edges (1 Idler pulley, 2 Bottom metal edge, 3 Top metal edge, 4 Deflection pulley)

7. Storage and maintenance

- Clean the van de Graaff generator with warm water and some dish washing liquid and dry it thoroughly (with a hair dryer). Never use solvents.
- In case the generator is not in use for a longer period of time, remove the rubber belt and store it in a dark place.
- Store the Van de Graaff generator at a dry place and always cover it with the dust cover. Do not expose the generator to direct heat sources (sun, radiator).

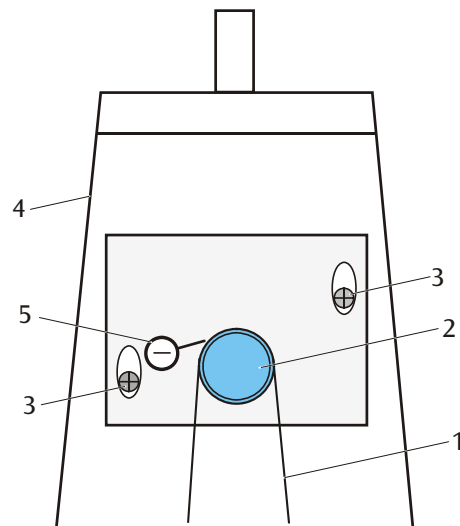


Fig. 2 Retensioning the rubber belt (1 Rubber belt, 2 Deflection pulley, 3 Phillips-head screws, 4 Bracket for deflection pulley, 5 Top metal edge)

8. Rectifying errors leading to insufficient charging

Cause	Measures
Damp	Dry out the generator with dry air (e.g. using a hair dryer).
Dirt	Rollers, insulators, conductor spheres and rubber belt should be cleaned and then dried.
Metal edge positions	Check the metal edges. Set them up as close as possible to the belt without actually touching it
Juddering of the belt	Tighten up the belt as described under 6.3.

9. Disposal

- The packaging should be disposed of at local recycling points.
- Should you need to dispose of the equipment itself, never throw it away in normal domestic waste. Local regulations for the disposal of electrical equipment will apply.

