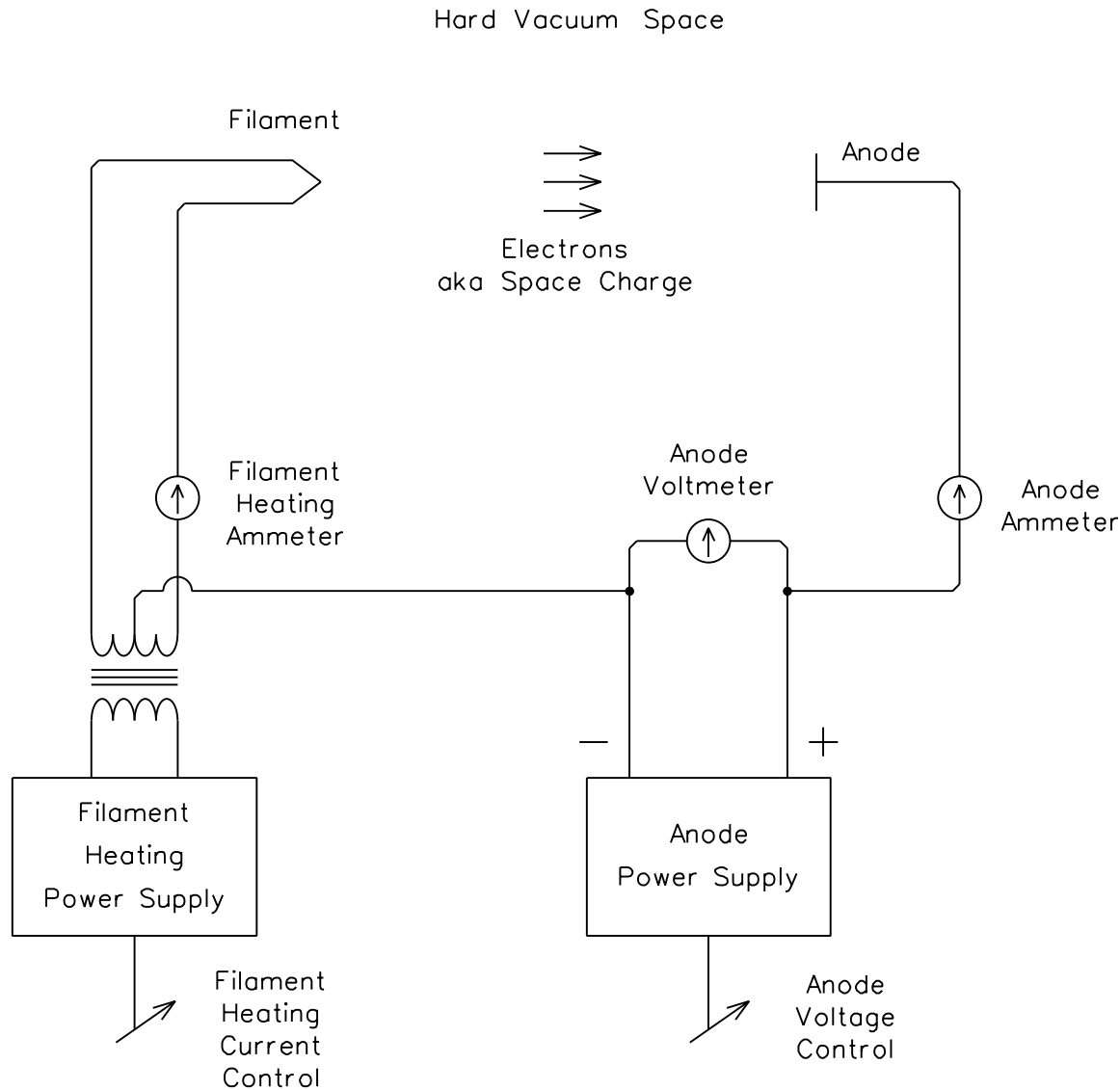


Sputtering Gun & Its Power Supplies Step #1



Vacuum Diode or High Vacuum Rectifier

Two operation regions:
thermionically limited
space charge limited

Its I-V curve is described by the Langmuir-Child Law.

Langmuir got a Nobel in 1932.

The Anode Current goes as its potential wrt the Filament to the $3/2$ power divided by the distance between them.

Note: you will never get to a 10 Amp Anode Current with practical dimensions and reasonable voltage drop.

Emission of electrons by the hot filament is described by either the Richardson equation or the Dushman equation.

These equations involve the usual suspects: Planck and Boltzmann constants and the work function and absolute temperature of the hot filament.