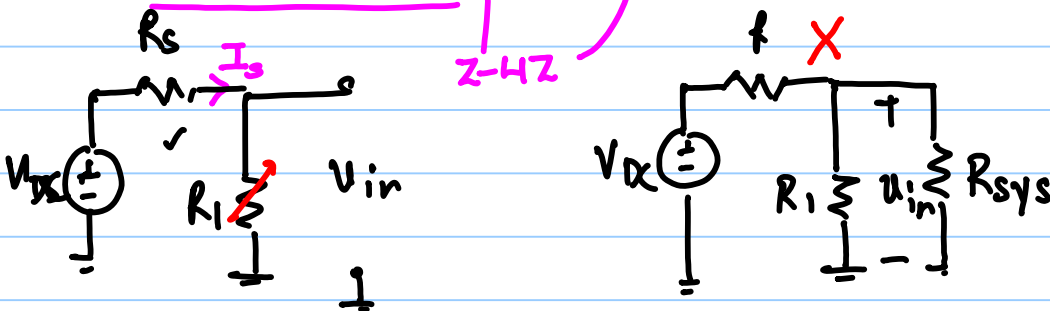
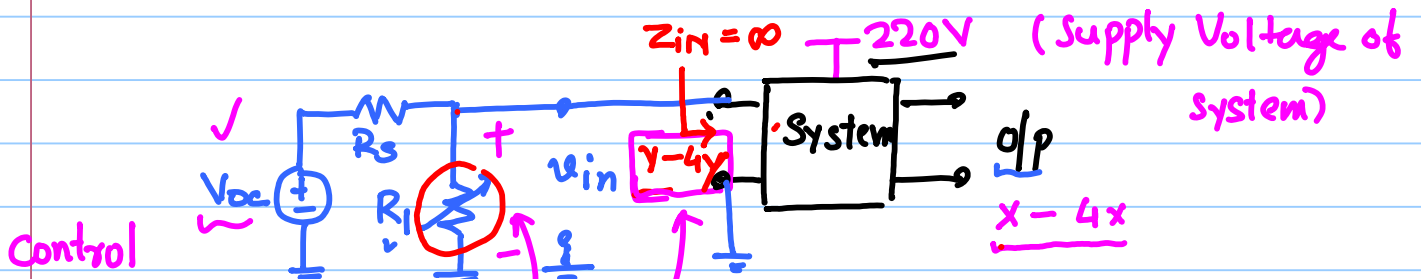
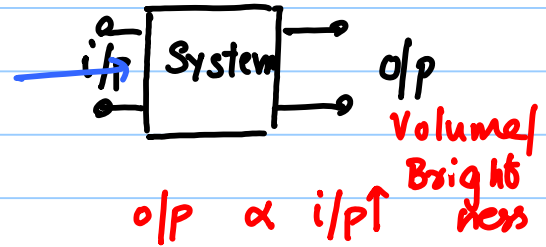
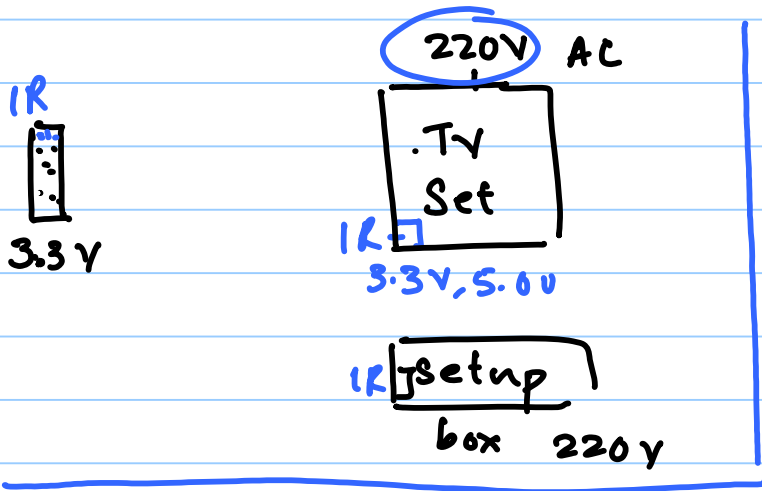


Electricals / Electronic Systems.

- Laptop, Computer, Phones
 - Volume - Mechanic Switch, Touch screen
 - Brightness of screen - Touch screen
 - Keyboard - Mechanical device
- Current, Voltage Current, Voltage

- AC, Heater, Water heater, fan : Voltage, Current



$$V_{in} = \frac{R_1}{R_1 + R_s} V_{DC} \quad V_{DC} = 3.0V$$

$$0 \leq U_{in} \leq V_{DC}$$

$$0 \leq I_s \leq \frac{V_{DC}}{R_s}$$

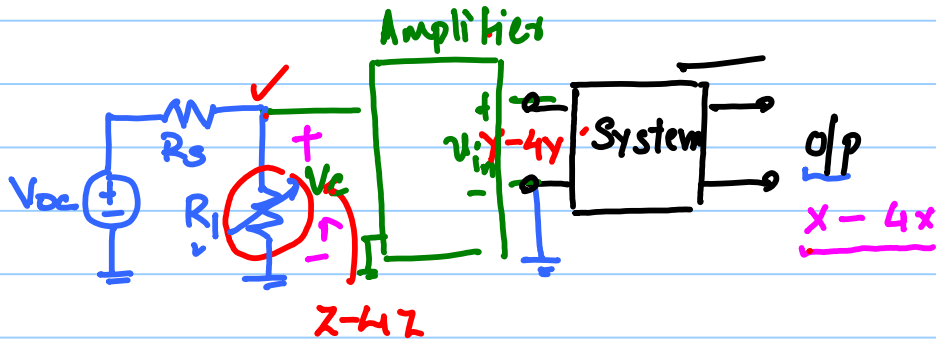
$$0 \leq R_1 < \infty$$

$Z = 4Z$
 $X = 0.25$
 $4Z = 1.0V$

#1 V_{DC} limits the controllable voltage.

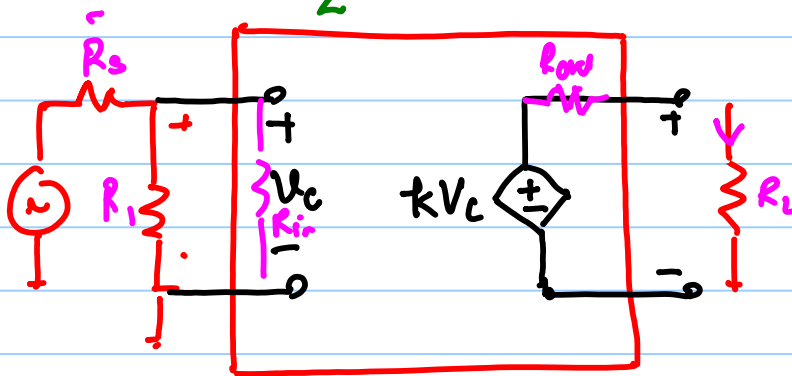
#2 Large variation in R_1

#3 Power consumed = $\frac{V_{DC}^2}{R_s + R_1}$



$$Z \rightarrow Y$$

$$\frac{Y}{Z} = \text{Gain}$$



voltage Controlled Voltage Source (VCVS)