

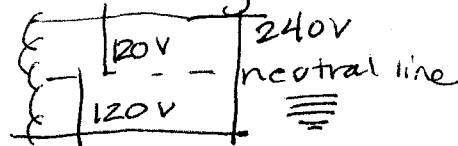
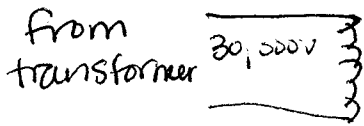
Advantages:

- distribution uses smaller cables
- amount of lost energy reduced
- disadvantage  $\rightarrow$  high voltage is unsafe

Single Phase Power: (1 $\phi$ )

- use in residential, church, dorms etc.

- generally 100-200 amps



2 legs w/ neutral  
neutral carries  
unbalanced load  
and is tied to  
the ground

Three Phase Power: (3 $\phi$ )

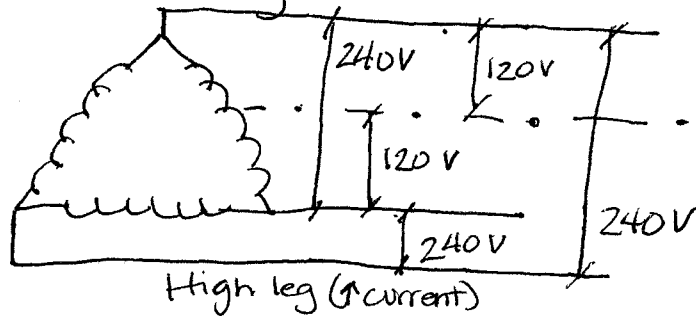
- 3 legs w/ current each at 120° out of phase

- used in industrial buildings w/ large loads

Primary



Secondary



Volts only  
broken in  
half by  
neutral

Delta-Delta

Wye Geometry for Offices & Shopping Centers

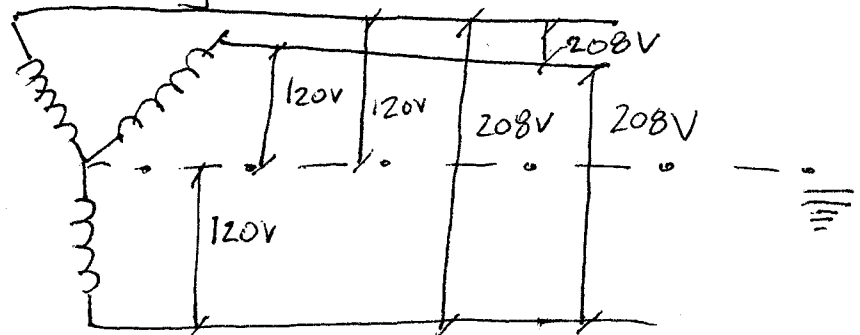
- 120/208V, 3 $\phi$  system

- 277/480V, 3 $\phi$  system, available

Primary



Secondary



Delta-Wye

Transformer Size: 240 V  
150 Amps

$$= V \times \text{Amps} \div 1,000$$

$$= 240 \times 150 \div 1,000 = 36,000 \text{ Va}$$

$$= 36 \text{ kVa}$$

Nov. 22

~~Single Phase Power:~~

3 $\phi$  Transformer ↗ only in three phase

480 V 600 Amps

$$= \text{Volts} \times \text{amps} \times \sqrt{3} \div 1,000 =$$

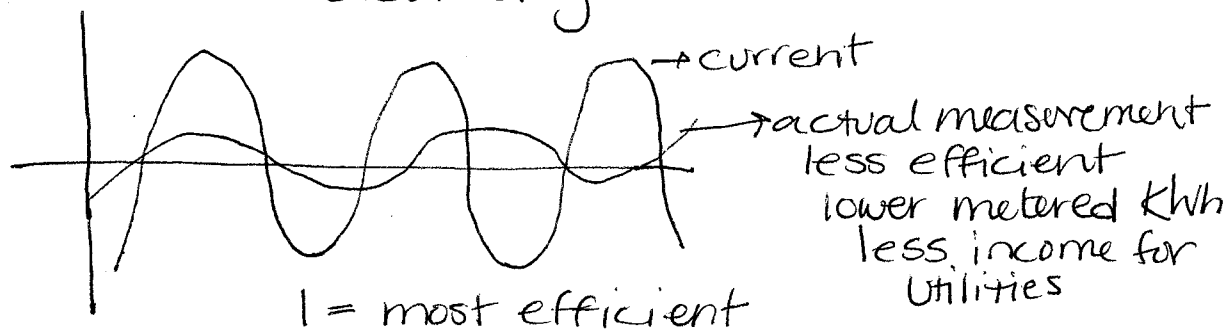
$$= (480) \times (600) \times 1.732 \div 1,000 = 498.8 \text{ kVA}$$

$$= 500 \text{ kVa}$$

Power Factor:

# used to quantify lagging current  
- buildings with low power factor use elec. less efficiently

lagging current  $\rightarrow$  coils (machinery) impeded flow of electricity

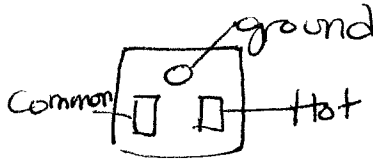


Grounding: connect system to the earth  
important for safety \*dissipate fault currents caused by lightning or equipment failure

- ① Connected by plumbing pipe left. into ground
- ② neutral line is connected to the ground at Service panel to provide a neutral potential

## Circuits

- duplex lighting
- three plug



## Ground Fault Circuit Interrupter (GFCI)

- \* Constants monitor the precise difference between the current in the conductor and the current in the neutral line
- if there is a difference then ground fault current is flowing
- prevents fire & electrocution

## Distribution Diagram:

