ECE 215 Spring 2025

Objective 1.7:
Power Converters
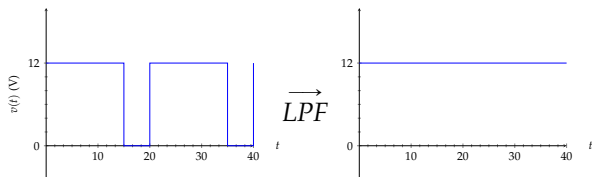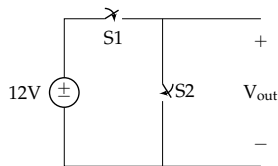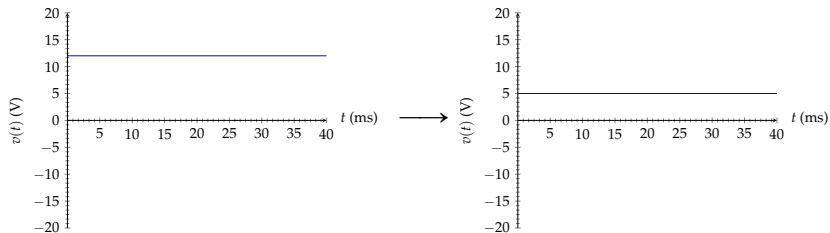
UNITED STATES

AIR FORCE
ACADEMY

Objective 1.7

I can calculate the efficiency, source voltage, and current of a power transmission system with one or more power converters.
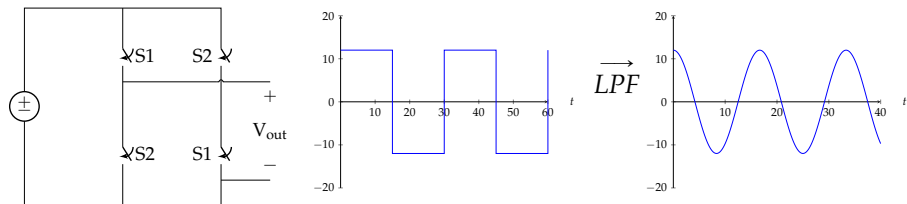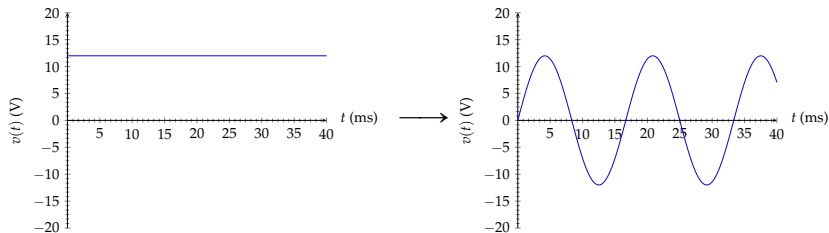
POWER CONVERSION

- Most electronic and _____ loads are _____.

- Actuation _____ are _____.

- High power motors are usually _____.

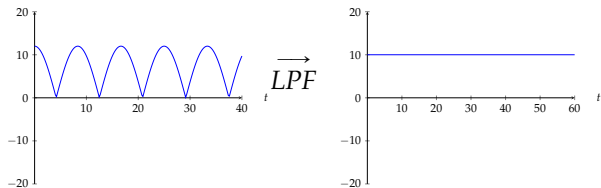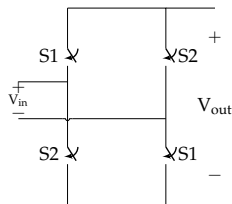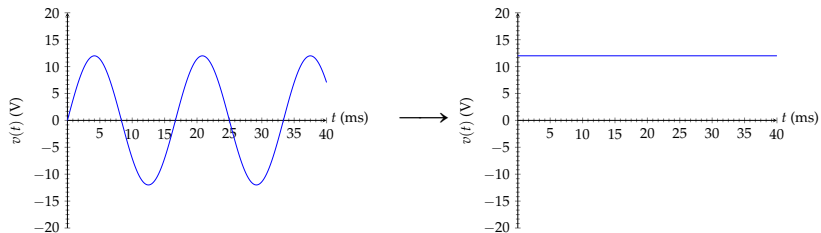- Since modern systems have both flavors of power, we need _____ that _____ from AC to DC _____.

DC-DC CONVERSION

DC-AC CONVERSION (INVERSION)

AC-DC CONVERSION (RECTIFICATION)

PROCESS FOR ANALYZING POWER CONVERTERS

- Find **real power** at the output of the converter
- Use efficiency to find **real power** at input to converter
- Use input voltage (and possibly pF) to calculate input current of converter

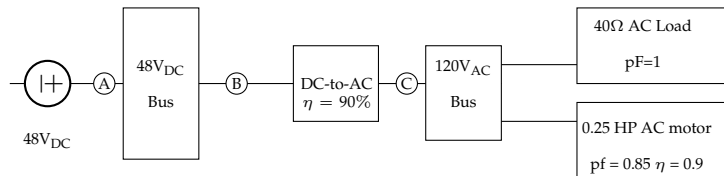# ANALYZING POWER CONVERTERS - EXAMPLE 1

Given the circuit below, determine the current at the input to the dc/dc converter and estimate a circuit breaker rating to protect the converter from abnormal operation (Breaker B).
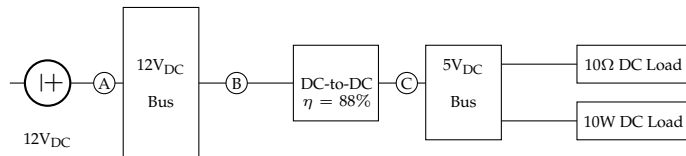
ANALYZING POWER CONVERTERS - EXAMPLE 2

Given the circuit below, determine the DC current at the input to the dc/ac inverter, then appropriately size breaker B.

ANALYZING POWER CONVERTERS - EXAMPLE 3

Given the circuit below, determine the DC current at the input to the ac/dc inverter, then appropriately size breaker B.