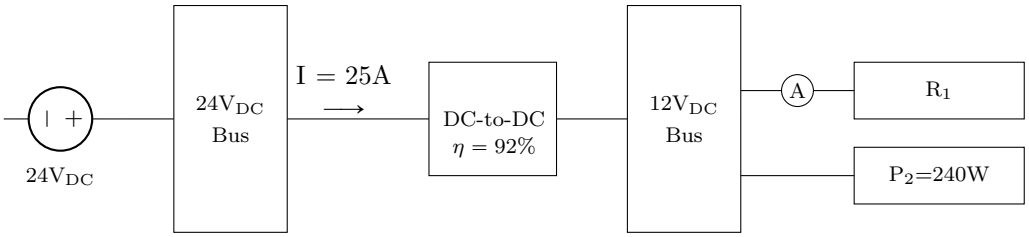
1. Analyze the following DC section of a power system.



(a) Determine the power going into the DC/DC converter.

$P_{dc/dc,\ in}$ = 600W

(b) Find the power out of the DC/DC converter.

$P_{dc/dc,out}$ = 552 W

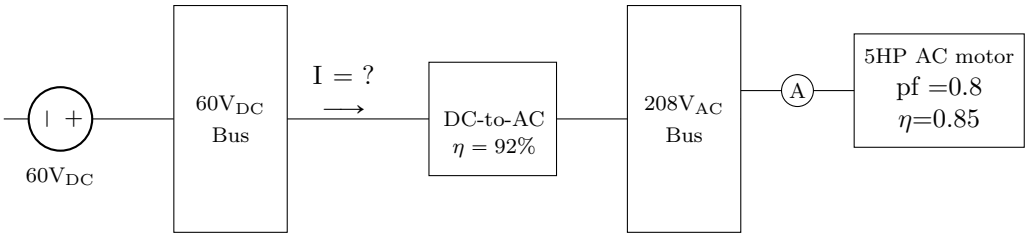
(c) Determine the value of the unknown resistance R_1 (note that it consumes part of the power from Part (b)).

R_1 = 462 mΩ

(d) What would be a reasonable circuit breaker value to protect the R_1 load?

Value = 29A

2. Analyze the following section of a power system.



(a) Assuming the motor is operating at 5HP, find the real electrical power going into the motor.

$P_{motor,\ in}$ = 4.39 kW

(b) Find the real power going into the DC/AC inverter.

$P_{DC/AC}$ = 4.77 kW

(c) Determine the DC currrent into the DC/AC inverter and suggest a suitable circuit breaker value to protect it.

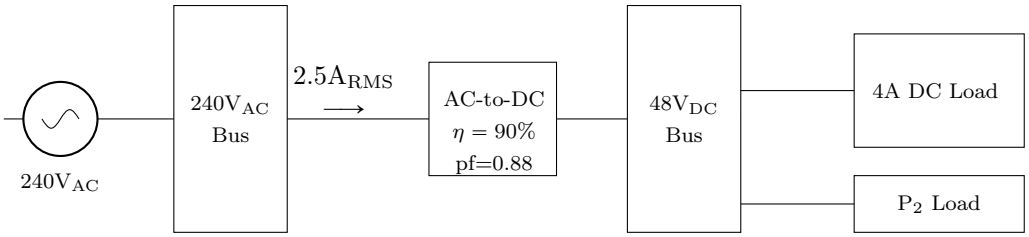
$I_{DC/AC,\ in}$ = 79.5 A

Fuse = 87.5A

(d) If we choose to allow I = 90A (and the circuit breaker rating is adjusted appropriately), how much additional real power can be added to the $208V_{AC}$ bus at this value?

P = 580 W

3. Analyze the following section of a power system.



(a) Find the apparent power into the AC/DC converter.

$S_{AC/DC}$ = 600VA

(b) Find the real power going into the AC/DC converter.

$P_{AC/DC,\ in}$ = 528W

(c) Find the real power out of the AC/DC converter.

$P_{AC/DC,\ out}$ = 475W

(d) Find the unknown power, P_2

P_2 = 283W