Maximum Flux per pole

$$\emptyset' = (0.00145 + \frac{0.003}{P})\sqrt{\frac{60P_s}{f}}$$

Where, $P = Number\ of\ poles$

$P_s = Rated\ Output\ power\ in\ horse\ power\ (hp)\ unit$

$f = frequency$

For our motor, $P_s = 325\ W = 0.4357\ hp\ , P = 4\ , f = 50\ Hz$

$$\therefore \emptyset' = \left(0.00145 + \frac{0.003}{4}\right)\sqrt{\frac{60 \times 0.4357}{50}} = 0.00159076887\ Wb$$

Winding Factor

$$N_{sl} = \frac{S_1}{Pm}$$

Where, $S_1 = Slots\ Number = 24$

$P = Pole\ number = 4$

$m = Phase = 3$

So,

$$N_{sl} = \frac{24}{4 \times 3} = 2\ slots\ per\ pole\ per\ phase$$

$$\therefore There\ are\ \frac{S_1}{P} = \frac{24}{4} = 6\ slots\ per\ pole$$

Pitch in Electrical degree, $e = 180°$

Pitch factor,

$$K_p = \sin\left(\frac{e}{2}\right) = 1$$

$$\gamma_1 = \frac{180 \times P}{S_1} = \frac{180 \times 4}{24} = 30°$$

$$K_d = \frac{\sin\left(\frac{N_{sl}\gamma_1}{2}\right)}{N_{sl}\sin\left(\frac{\gamma_1}{2}\right)} = \frac{\sin\left(\frac{2 \times 30}{2}\right)}{2 \times \sin\left(\frac{30}{2}\right)} = 0.9659$$

$$K_{\omega 1} = K_p K_d = 0.9659$$

By choosing a single current winding,

$$C_s = \frac{0.97 a V_1}{2.22 K_{\omega 1} P N_{sl} f \emptyset'} = \frac{0.97 \times 1 \times \frac{410}{\sqrt{3}}}{2.22 \times 0.9659 \times 4 \times 2 \times 50 \times 0.00159076887} \approx 156 \; conductor\ per\ slot$$

Full load current, $I_s = \frac{P_S \times 746}{\sqrt{3} \times V_L \times pf \times \eta} = \frac{0.4357 \times 746}{\sqrt{3} \times 410 \times 0.85 \times 0.77} = 0.7\ A$

For this maximum current (0.7 A) for chassis wiring

Wire Size=31 AWG

Wire Diameter=0.00893 inches