

BAB IV

PEMBAHASAN DAN PERHITUNGAN

4.1 Spesifikasi Motor

Single Phase Motor

Type : JY2A-4 1HP

Rpm : 1400 Rpm Cont Class E

110/220V-14,54/7,27 A

Made In China

4.2 Perbandingan Kecepatan Pulley

$$\frac{n_m}{n_p} = \frac{d_p}{d_m}$$

Dimana, n_m = kecepatan motor (rpm)

n_p = kecepatan poros (rpm)

d_p = diameter *pully* motor (mm)

d_m = diameter *pully* poros (mm)

Diketahui :

$$\text{Diameter pully motor} = 60 \text{ mm}$$

$$\text{Diameter pully Poros (driven)} = 250 \text{ mm}$$

$$\text{Kecepatan Motor (Rpm)} = 1400 \text{ Rpm}$$

Maka kecepatan putaran puli (*driven*) pada poros adalah sebagai berikut :

$$\frac{n_m}{n_p} = \frac{d_m}{d_p}$$

$$\frac{1400}{n_p} = \frac{250 \text{ mm}}{60 \text{ mm}} = 4,1$$

$$\frac{1400 \text{ rpm}}{n_p} = 4,1$$

$$n_p = \frac{1400 \text{ rpm}}{4,1}$$

$$n_p = 341 \text{ rpm}$$

4.3 Menghitung Arus (Ampere) Motor

$$P = V \cdot I \cdot \cos \varphi \quad I = \frac{P}{V \cdot \cos \varphi}$$

$$P = V \cdot I \cdot \cos \varphi$$

$$= 1 \text{ HP} = 745 \text{ Watt}$$

$$I = 745 / (220 \times 0,88) = 3,84 \text{ Ampere}$$

4.4 Menghitung Daya Motor

$$P = \sqrt{3} \cdot V \cdot I \cdot \cos \varphi \qquad I = \frac{P}{\sqrt{3} \cdot V \cdot \cos \varphi}$$

$$\begin{aligned} P &= \sqrt{3} \cdot V \cdot I \cdot \cos \varphi \\ &= 1,73 \times 220 \times 3,84 \times 0,88 \\ &= 1286 \text{ Watt} \\ &= \mathbf{1,3 \text{ kW}} \end{aligned}$$

4.5 Menghitung Daya Output Motor

$$P_{\text{output}} = \sqrt{3} \cdot V \cdot I \cdot \text{eff} \cdot \cos \varphi$$

$$P_{\text{Output}} = 1,73 \times 220 \times 3,84 \times 0,8 \times 0,88$$

$$= 1028 \text{ Watt} = 1 \text{ kW}$$

$$= \mathbf{1,3 \text{ HP}}$$

4.6 Menghitung Efisiensi Daya Motor

$$\eta = \frac{P \text{ output}}{P} \times 100$$

$$= 1028 / 1286 \times 100\% = \mathbf{80\%}$$



4.7 Kecepatan Potong

NO	NAMA BAHAN	WAKTU POTONG	KECEPATAN
1.	Hollow Aluminium 40x40mm	15"	341 rpm
2.	Besi Siku 50x50mm (Mild Steel)	28"	341 rpm
3.	Round Bar 12mm (Mild Steel)	22"	341 rpm
4.	Besi Pejal Teralis 10x10mm (Mild Steel)	20"	341 rpm