

Cross-section of different parts

Air-gap cross-section = 2415.10 [mm<sup>2</sup>]

Stator tooth cross-section = 1100.00 [mm<sup>2</sup>]

Stator yoke cross-section = 1050.00 [mm<sup>2</sup>]

Flux densities in the different part of the machine when air-gap flux density is 0.70 [T]

Stator tooth flux density = 1.54 [T]

Stator yoke flux density = 1.61 [T]

Rotor yoke flux density = 0.85 [T]

Magnetic field intensities in the different part of the machine when air-gap flux density is 0.70 [T]

Air-gap Magnetic field intensity = 557042.30 [A/m]

Stator tooth Magnetic field intensity = 2475.80 [A/m]

Stator yoke Magnetic field intensity = 4338.37 [A/m]

Rotor yoke Magnetic field intensity = 82.74 [A/m]

Length of flux path in different parts of the machine

Length of flux path in rotor = 39.17 [mm]

Length of flux path in stator yoke = 53.83 [mm]

Length of flux path in stator tooth = 15.50 [mm]

Length of flux path in air-gap = 1.00 [mm]

MMF drop in different parts of the machine when air-gap flux density is 0.70 [T]

MMF drop in rotor yoke = 3.24 [A-turn]

MMF drop in stator tooth = 38.37 [A-turn]

MMF drop in stator yoke = 233.52 [A-turn]

MMF drop in air-gap = 557.04 [A-turn]

Magnet thickness = 5.50 [mm]

Magnet width = 20.00 [mm]

No load flux in the air-gap = 0.00188 [Wb]

No load flux density in the air-gap = 0.78 [T]

No load flux density in stator tooth = 1.71 [T]

No load flux density in stator yoke = 1.79 [T]

Total number of turns per phase = 60

Total number of coils in series per phase = 4

Total number of turns per coil = 15

Total number of conductors per slot = 60

Slot area = 66.7 [mm<sup>2</sup>]

Cu area = 21.8 [mm<sup>2</sup>]

Fill factor = 0.33

Maximum per phase induced voltage at no-load = 31.1 [V]

Maximum line to line induced voltage at no-load = 53.9 [V]

Maximum line to line induced voltage at 1257 [rpm] = 1158.5 [V]

Ratio of maximum line to line induced and DC link voltage at max speed of 1257 [rpm]

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= 2.9

Resistance per phase = 162.0 [mOhm]  
Reluctance of d-flux path = 5288871.1 [H<sup>-1</sup>]  
Reluctance of q-flux path = 1091846.4 [H<sup>-1</sup>]  
D-axis inductance = 1.0 [mH]  
Q-axis inductance = 4.6 [mH]  
Saliency ratio = 4.8  
l\_coil\_theoretical = 0.3  
l\_coil\_calc = 0.4  
efficiency = 91.1  
power\_factor = 0.3  
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