

INITIAL DESIGN PARAMETERS – 3 PHASE INDUCTION MACHINE

Machine parameters(RMxpert):

- Number of phases -3 phases
- Number of poles (P) - 12
- Frequency of operation (f_s) – 50 Hz
- Reference/Synchronous speed - $\frac{120 \times f_s}{P} = 500 \text{ rpm} = 8.34 \text{ rps}$
- Rated power factor – 0.7048
- Rated Power (P_{out}) - 5 kW
- Frictional losses – 7 W
- Windage losses – 213 W(stator) + 287 W (rotor)
- Stray losses – 25 W
- Efficiency – 87.61 %
- Output power – 5 kW
- Input power – 5.7 kW
- Rated Slip – 0.054
- Rated Torque – 100.996 Nm
- Total loss – 0.707 kW

Locked Rotor Parameters:

- Stator Resistance – 0.57 Ω
- Stator Reactance – 4.19 Ω
- Rotor Resistance – 1.29 Ω
- Rotor Reactance – 2.4 Ω

Stator parameters:

- Number of slots in stator core – 36
- Outer diameter – 0.327 m
- Inner diameter – 0.210 m
- Core length – 0.280 m
- Stacking factor – 0.92
- Steel type – Auto defined – M19_24G
- Slot Type – Auto defined – Type 2
- Lamination Sectors – Auto defined = 0
- Press board thickness – Auto defined = 0 mm
- Skew Width – Auto defined = 0

Stator slot parameters:

- Hs0 – 0.8
- Hs1 – 0.52
- Hs2 – 39.48
- Bs0 - 3
- Bs1 – 4.8
- Bs2 – 8.2

Parameters of Stator Windings:

- Winding layers – Single windings
- Winding type – Whole coiled
- Parallel branch - 1
- Conductors per slot - 24
- Number of strands – 4 (Auto defined)
- Wire Wrap – 0.09 (Auto defined)
- Wire size – 1.12mm (Auto defined)

Rotor Parameters:

- Stacking factor – 0.92
- Number of conductor bars – 49
- Slot type – Type 2
- Outer diameter – 0.2095 m
- Inner diameter – 0.075 m
- Core length – 0.280 m
- Steel type – M19_24G (Auto defined)
- Skew Width – 0
- Cast rotor – Yes

Rotor Slot Parameters:

- Hs0 – 0.5
- Hs01 – 0
- Hs1 – 0.66
- Hs2 – 14.34
- Bs0 – 1
- Bs1 – 3.3
- Bs2 – 3.3

Parameters of rotor windings:

- Bar conductor – cast_aluminium_75C (Auto defined)
- End length – 0 mm
- End ring width & diameter – 40mm (about 2.36 in) and 16 mm (about 0.79 in)
- End ring type conductor – cast_aluminium_75C (Auto defined)