ac A-C/m	14500	19300	27500	33000	38500	41000	42000	44000

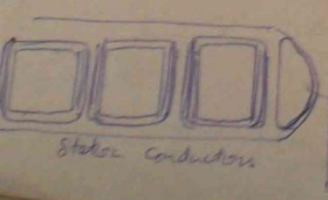
eg. 1.25 MVA, at P.f 0.8 lag, 1 mcw, 3 ϕ, 50 Hz

Slot dimensions:

A no load flux density of 1.7 to 1.8 cob/m² will be found to be huge enough for 50Hz m/cs, otherwise the tooth losses become excessive. The total flux of 57.6 m wb & a mean density of 0.875 cob/m² over the pole face is assumed. The pole arc is 0.66 × 29.8 ≈ 19.5 m & the no of teeth per pole arc $\frac{19.5}{3.31} \approx 6$. If the tooth density is not exceed 1.8 cob/m², the tooth width must not be < 2. This permits a slot width not exceed

Width (mm)	
Conductor insulation	0.7
Binding tape	0.5
Cell 2×1.75	3.5 ?
Clearance & slack	1.2
	5.9 mm

Depth	mm
Tooth lip	1.5
Wedge	4.0
Cell 2×1.75 ?	3.5
Binding tape	0.5
Conductor insulation 5×0.7 ?	3.5
Micarite separators 5×0.3 ?	1.5
Leatheroid strip	0.75
	15.25 mm



1.25 MVA, 3.3 kV rating ∴ I = 219 A

Conductors:

The assumed current density is 4 A/mm². This requires a conductor area of $\frac{219}{4} = 55\ mm^2$. $\left(\frac{1250,000}{\sqrt{3} \times 3300} / 4\right)$. Taking a slot width of say, 1.35 cm, & insulation as above of 5.9 mm total thickness, the conductor can be 13.5 − 5.9 = 7.8, say 7.5 mm × 7.5 mm. with rounded corners, giving an area of 54 mm². The five conductors require a total width of 37.5 mm, which with a total insulation, wedge & lip thickness of 15.25 mm as above, permits a slot depth of 37.5 + 15.25 = 53 mm, say The slot mouth is made 3 mm wide. Overhang: with 3 slots/pole/ph, the overhang can be arranged in two planes. With the no. of poles a even, there are no cranked coils. Resistance: From an estimate, the mean length per conductor is 54 cm in the overhang & 33.5 cm in the core or 87.5 cm. The resistance/ph at 75°C is

$$r = \frac{\rho}{0.021 \times 0.871 \times 300 / 54} = 0.102\ \Omega$$

$$N_2 = \frac{120 f}{P} \qquad T_{ph} = 150 \text{ turns}$$

$$300 = \frac{120 \times 50}{P} \qquad \text{No. of conds/ph} = 300$$

$$\therefore P = 20 \text{ poles}$$

Calculating the eddy-current loss factor,