|  |  |  |
| --- | --- | --- |
|  | **Core Design** |  |
| *Parameter* | *Design* 1 | *Design* 2 |
| Core diameter | 540 mm | 550 mm |
| Maximum flux density Bmax | 1.7 T | 1.7 T |
| Volts per turn | 77.78 |  |
|  | **LV Design** |  |
| LV turns | 424 | 408 |
| Current per phase LV | 318.2 A | 318.2 A |
| Number of discs | 106 | 102 |
| Turns per disc | 4 |  |
| Current density | 3 A/mm2 | 3 A/mm2 |
| Required cross sectional area | 318.2/3 = 106 mm2 | 318.2/3 = 106 mm2 |
| Actual area | 10.6\*2.5\*4 = 106 mm2 | 10.2\*2.6\*4 =106 mm2 |
| Insulation thickness on conductors | 0.7 mm | 0.7 mm |
| Insulation thickness between discs | 3 mm | 3 mm |
| Height of winding | 1520 mm |  |
| Depth of winding | 52 mm | 54 mm |
|  | **HV Design** |  |
| HV turns | 980 |  |
| Current per phase HV | 137.78 A | 137.78 A |
| Number of discs | 98 |  |
| Turns per disc | 10 | 10 |
| Current density | 3 A/mm2 | 3 A/mm2 |
| Required cross sectional area | 45.9 mm2 | 45.9 mm2 |
| Actual area | 46.2 mm2 (2.98 A/mm2) | 46.5 mm2(2.96 A/mm2) |
| Insulation thickness on conductors | 1 mm | 1 mm |
| Insulation thickness between discs | 4 mm | 4 mm |
| Height of winding | 1520 mm |  |
| Depth of winding | 65 mm |  |
|  | **Overall dimensions** |  |
| Phase to phase distance | 52 mm | 54 mm |
| Center to center distance | 970 mm |  |
| Winding to top yoke clearance | 200 mm | 200 mm |
| Winding to bottom yoke clearance | 80 mm | 80 mm |
| Window height | 1800 mm |  |
|  | **Performance parameters** |  |
| Core losses | 25.5 kW |  |
| Core weight | 16334 kg |  |
| Rc | 683.3 kΩ |  |
| xm | 112.1 kΩ |  |
| Leakage inductance | 0.158 H |  |
| RLV | 0.5076 Ω |  |
| LV losses | 51.4 kW |  |
| RHV | 3.598 Ω |  |
| HV losses | 68.3 kW |  |
| Total losses | 144 kW |  |
| LV winding weight | 2402 kg |  |
| HV winding weight | 3236 kg |  |
| Resistance of transformer per phase referred to HV winding | 2.53 Ω |  |
| Reactance of transformer per phase referred to HV winding | 49.6 Ω |  |