

SMALL HYDRO DEVELOPMENT

The Second International Conference on Small Hydro Organised by "INTERNATIONAL WATER POWER & DAM CONSTRUCTION MAGAZINE" was held in Hangzhou, China. The four days conference attracted 280 delegates from 38 countries and 25 technical papers.

NEW IDEAS :

A new type of Vertical-Shaft axial-field generator developed by University of Hongkong, it is reported "could have dramatic effect on Small Hydro Plant Design." The axial-field generator has a stator and rotor in the form of coaxial discs, located side by side, in contrast to the concentric rotor and stator arrangement of conventional radial-field machines resulting in an air gap magnetic flux running parallel to the machine shaft rather than axially.

Fig 1 shows a design of a double-stator machine. Alternatively, the double stator could be sandwiched between two rotors.

The stator core laminations are formed from silicon sheet steel wound like a coiled spring. The armature teeth are sector shaped. As a result each armature tooth has a uniform Cross Section.

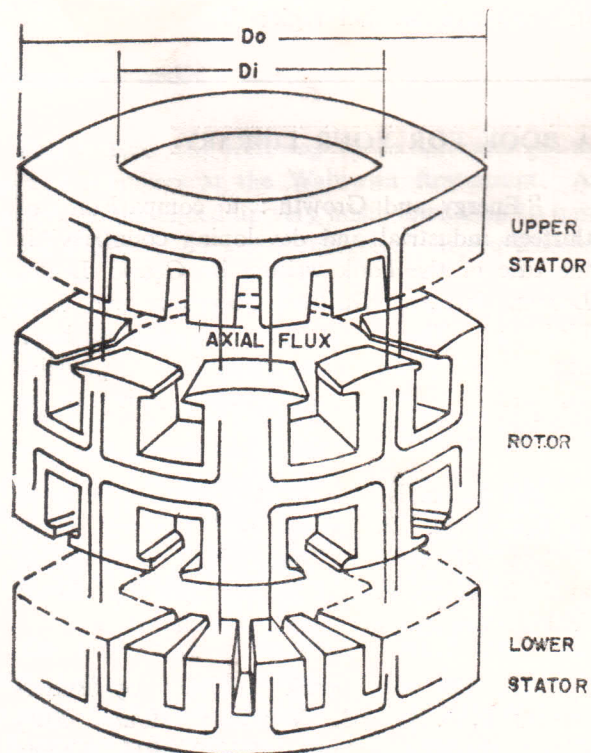


Fig. 1 Double-stator axial-field Generator, showing steel cores only

The rotor comprises a thick disc shrunk or pressed into shaft, with laminated poles secured into Sector-shaped groves in the disc surface.

Each half of the double-stator machine thus forms a separate three phase generator if, a three-phase armature winding is provided on each stator. The two sets of stator windings can be connected in series or parallel, depending on the output voltage and current required. See figures land 2.

The vertical-shaft axial field generator has the following advantages (a) Greater flywheel effect (b) machine can operate with a "floating rotor" eliminating thrust bearings (c) Power to volume ratio greater at lower speeds. (d) permits modular construction (e) adjustable air gap (f) repair work of the axial field machine is easier and not much skill is required.

A 160 KW generator is now being constructed in Southern China to examine commercial feasibility.

Other new developments that were discussed are, Refined Cross Flow Turbine, the Salford Transverse Oscillator (STO) the hydropneumatic turbine and water turbine pump.

— SHP NEWS. —

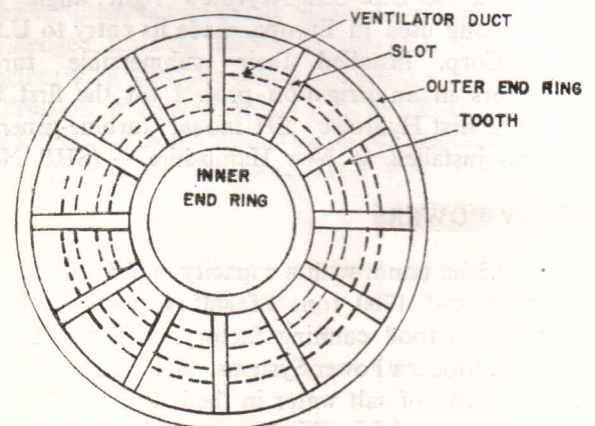


Fig. 2 stator core