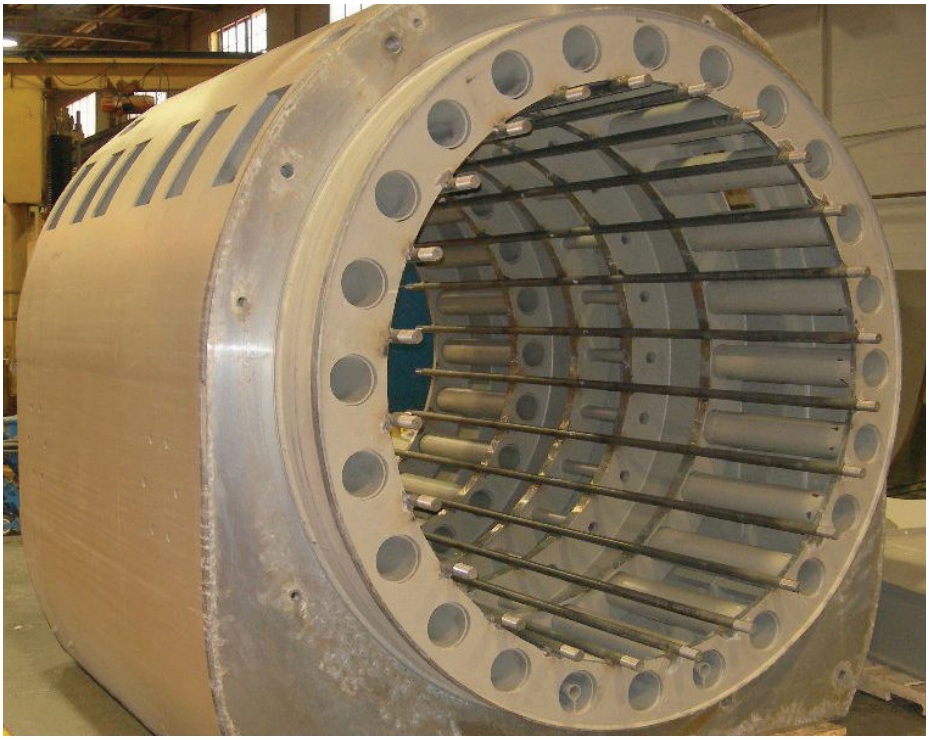
2-Pole Turbine Generators

Stator Construction

Generator stator frame construction isolates normal core generated double frequency vibration from the foundation and distributes airflow to provide uniform temperatures in the core.



Stator frame center fabrication.

Frame-TEWAC or Room Air Cooled

The stator frame is designed to provide either a totally enclosed water-air-cooled (TEWAC) or a room air cooled (RAC) housing for the generator. Air is recirculated in the TEWAC machine through air to water heat exchangers. Air is circulated in the RAC machine with intake air drawing in the ends and air discharged out the top center. The frame is fabricated from thick steel plates with all weldments specially controlled to assure integrity of structure. The cross section plates are cut on a numerically controlled machine to assure uniformity from section to section.

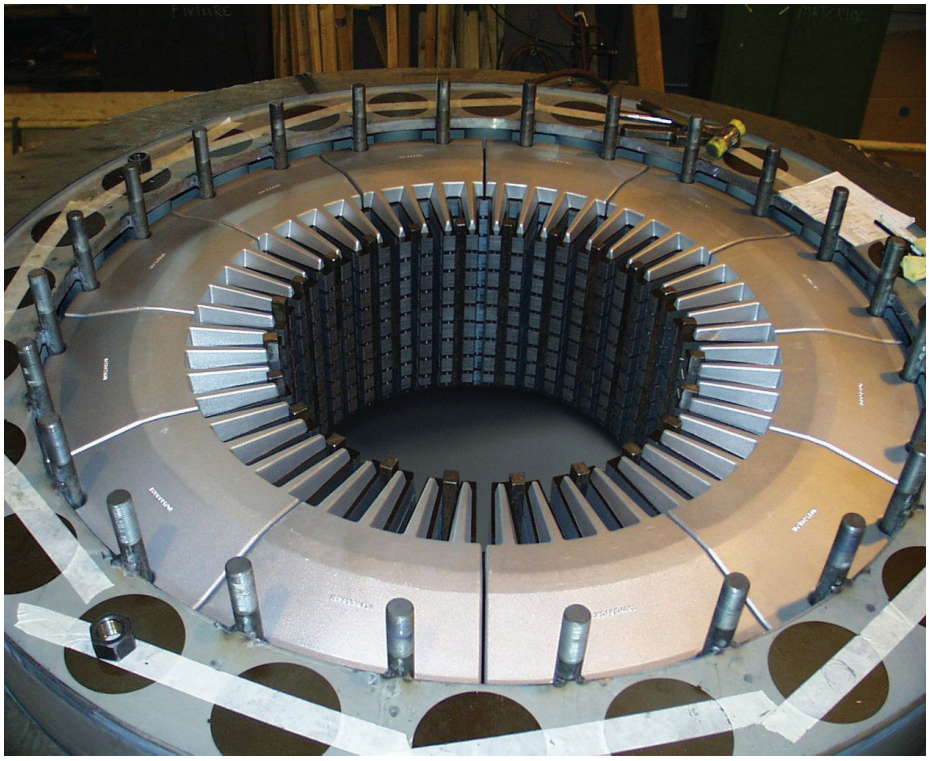
Flexible Stator Core Mounting

(Model series 2800 and larger)

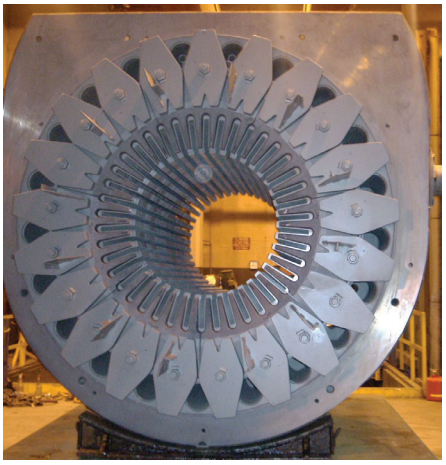
For each complete revolution of the rotor, every portion of the stator is twice subjected to the strong magnetic attraction of a rotor field pole. At 3,600 rpm this causes 120 vibrations per second, producing a characteristic low frequency hum. To absorb this vibration, and to minimize audible low frequency hum, the stator core is flexibly mounted. The flexible core mounting design is based on the thin cylinder principle, which recognizes that cylinders can provide flexibility in the radial direction and still support heavy loads in a tangential direction. The cylindrical mountings are sectioned to provide support at each end of the stator and in the center of the core. The core supports are fastened to the ends of the cylinders with steel plates. Fame plates connect the opposite end of each cylinder to the foot plate. The pulsation of the core is absorbed by the cylinders rather than being transmitted to the foundation.

Circular Studs

Large diameter circular studs are welded to the machined stator bore to give added support and act as keys for core lamination stacking. Steel wrapper plates enclose the frame and provide additional support.



Installation of stator core clamping plates on lamination stack.



Stacked stator frame ready for winding of stator coils.

End Stacks

The end sections of the stator core are stepped back from the air gap to minimize fringing flux and to reduce end iron heating when the machine is operated outside of the normal power factor range.

Stator Core

The stator core consists of high silicon electrical steel laminations that are blanked and notched simultaneously for special high quality core plated sheet steel. After the punching operation, each lamination is precision edge ground to remove burrs. The burr grinding process is controlled so accurately that the burr is removed without destroying the core plated insulation film. The lamination segments are stacked on circular studs, which extend lengthwise within the stator frame. As the stator core laminations are stacked, vent duct spacers are inserted at specific intervals to provide cooling passages in the stator core for uniform cooling. Special care is taken to assure accurate slot alignment over the length of the core.

Accurate clamping pressure is applied to both ends of the stator core through non-magnetic pressure plates. These plates and the tooth support fingers have a special concave design. When properly pressurized, they will exert a uniform pressure on the face of the stator core teeth as well as the back of the stator core.

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