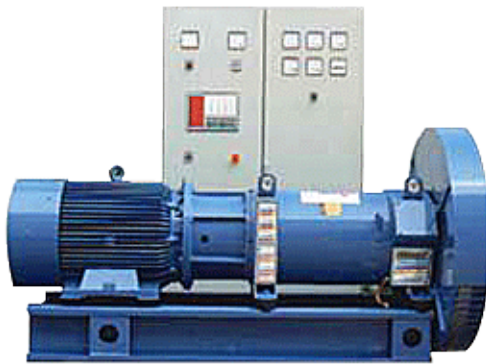


# Flywheel



Power range:  
up to 1500 kVA

- Typical system

## Advantages

- The operating life of static converter is limited by following conditions:
  - ◆ **Environmental conditions:**  
Because if climatic conditions and dust only an indoor application is possible.
  - ◆ **External ventilation**
  - ◆ **Spar parts purchasing:**  
The permanent chage of generations (already the 7th) complicates the purchasing and storage of spare parts. Spares for 2 generations in the past (app. 3 years) are often more expensive than the converter itself and makes repair works uneconomic.
  - ◆ **Extension of the system:**  
The change of generations can cause the unavailability of the same type of converter already after 2 to 3 years.

Rotating converter are in operation for mor than 30 years under most difficult conditions.

- **Maintenance:**  
Service- and maintenance works of the rotating coverter can be done by every technician. A static converter can only be maintained from a specialist from the supplier. Tthis can influence the service cost significantly.
- **MTBF-value:**  
The MTBF-Value (meantime between failure) of rotary converter is above 50.000 hrs. The MTBF of static converters is significantly lower due to the higher number of parts.
- **Spares:**  
Spares for rotary converter are available in almost every country of the world.
- **Grid loading effect:**  
When plannig static systems you have to consider, that because of current and voltage interferences caused by static converters the grid transformer has to be oversized by about 20%. Furtheron only such consumer can be connected to the transformer which are not influenced by the interferences. (Problems with UPS or diesel gen sets).

- **Efficiency:**

The efficiencies of rotary converter and static converters are almost the same. The additional losses caused by the inverter's harmonics are not included.

- **Distortion factor:**

The intensity of harmonics of rotary converters is much lower than those from static converters.

- **Suppression of radio interference:**

Suppression acc. N and K acc. VDE 0875 or MIL-standard can be fulfilled by rotary converter. Static converter already have problems with N acc. VDE 0875.

- **Input power factor:**

The power factor is automatically controlled within the range of 0.9 to 1.0 (reactive load supply) at 50% to 100% of nominal load. Static converter consume reactive load ( $\cos \phi$  0,75 - 0,85)

- **Overload:**

Rotary converter have better overload endurance than static converter.

- **Shock load response:**

By fast regulating the voltage at shock load often requests an enlargement of the system of static converter. Rotary converter have the capability to endure peak values of shock loads of 20 times nominal current (one half wave) or 3 times nominal current for several seconds.

- **Overcurrent discrimination:**

The request operating static converter systems without fuses is not possible or just under certain conditions. Current peaks up to 40x nominal current for one half wave are not seldom for static converters. To obtain a selectivity highest care is necessary when selecting fuses. The installation efforts for static converters is much higher than for rotary converters.

- **Indirect coupling (Galvanic separation):**

An indirect coupling is provided only by rotary converter.

- **Voltage peaks and EMP, NEMP:**

Electronic parts are more responsive against voltage peaks and high magnetic fields than windings are.

- **Shock:**

Shock proof systems with static converters are only limited practicable.