

Farapayam Engineering Co.

Static Var Compensator (SVC)



Description of SVC

► The static var compensator (SVC) is an advanced reactive power compensating device, capable of rapidly supplying capacitive or inductive power when required. The SVC can not only improve power quality in the electric distribution system to ensure the safe and reliable operation of the system and equipment, but also create a certain economic benefit for both of the customers and the utility.



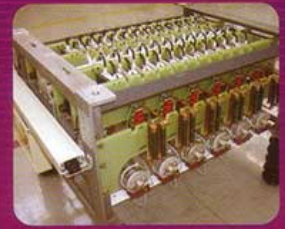
SVC applications

► The SVC has found wide applications in industries including electrical power, petrochemical, metallurgy, electrified railway, wind power, and coal mining. It supplies high quality, reliable compensating reactive power and filters harmonics for arc furnaces, rolling mills, induction furnaces, electric-driven locomotives, hoists, and wind power generators, thereby increasing the power factor, reducing the THD, alleviating voltage fluctuation and voltage flicker, and balancing currents in three phases.

Farapayam provides the following services

- Design studies at the preliminary project stage
- Production studies
- Production (in-plant inspection, tests)
- On site erection
- Commissioning and Technical support
- Customer personnel training
- Expert's reports

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Functional benefits of the Static Var Compensator

► The benefits of reactive power compensation, more constant voltage levels and reduced distortion levels are transferred to the end user as production increases, total power losses are reduced and reactive power penalties are avoided. Static Var Compensators increase the quality of power in many respects.

Flicker reduction

► Rapidly varying reactive power causes voltage fluctuations at the point of common coupling of a steel plant. The human eye perceives this frequency of voltage fluctuations as flickering lights.

Voltage stabilisation

► Electrical Arc Furnace (EAF) operations can be intensely unbalanced especially in the beginning of the melting process. The three-phase induction motors suffer due to the unbalanced voltage supply. The unbalanced voltage causes reduced efficiency, overheating, noise, torque pulses and speed pulses to motor operations.

The SVC operates in single-phase control mode, thus balancing the voltage.

Reactive power compensation

► Transmission of reactive power leads to significant voltage drops and current increases in the networks, which limits the transmission capacity of active power. Public utilities maximise their transmission line capacities by advising their customers to utilise local reactive power compensation.

The Static Var Compensator maintains the demand of reactive power within the limits set by utilities, thus avoiding penalties.

Reduction of harmonics

► Non-linear loads, like Electrical Arc Furnaces, generate harmonic currents. The harmonic currents load the network and lead to voltage distortions. Distorted voltage may cause malfunctions in sensitive computerised devices or process control equipment.

The filter circuit of the SVC system is designed to absorb harmonics generated by loads as well as by Thyristor Controlled Reactors (TCR). The total harmonic distortion (THD) and individual harmonic voltages are limited below specified levels.

The pay back time of the SVC investment ranges typically between one to two years.

Economical benefits

Energy savings

► Compensation and improving the quality of power increases the capacity of active power transmission and reduces energy consumption. Thus, the unnecessary overload of the power network can be avoided. Both your company and the environment benefit from the more efficient use of electricity and saving in the consumption of energy.

Increase in productivity

► The SVC system can keep a steel plant bus voltage practically at a constant level. This decreases the steel processing time and thus increases productivity. The SVC system also reduces production breaks and expensive restart procedures.

The arc furnace, stabilised by the SVC, also has a considerable positive effect on the consumption of electrodes, heat losses and the lifetime of the furnace's inside lining.

As the improved quality of power from the network reduces the stress on equipment, its lifespan increases, thus lowering the maintenance and replacement costs.

Benefits of the SVC:

- Increase in productivity
- Energy savings
- Reduction in consumption of electrodes
- Reduction of heat losses
- Increase lifetime of furnace inside lining



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