











Innovative Solutions in Compensation





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SVC SYSTEM



As Grup ARGE Energy and Control Systems, we produce complete and permanent solutions to reactive energy problems in enterprises with our innovative and intelligent products, and thus, together with the fact that enterprises get rid of paying reactive energy costs, we also contribute to reducing production and distribution infrastructure costs.

With the successful experience we have achieved with Smart SVC compensation systems, which were first introduced in 2009, we continue to be a leader in the sector by offering solutions and services in the fields of energy measurement, energy monitoring and management.

*New Generation Compensation System "Static Var Compensation System" was first developed by Grup R&D in 2009 and started to be used in LV systems in the sector.

What is Compensation?

Ideally, there is no phase difference between voltage and current. As a result of the effect caused by inductive or capacitive loads, the phase of the current signal shifts by a maximum of ± 90 degrees relative to the voltage signal. The process that corrects the phase shift between the voltage and current signal caused by inductive and capacitive effects and keeps it constant close to the ideal (0 degrees) is called compensation.

What is the SVC System?

The Smart SVC system is a new system developed in response to the fact that classical compensation systems made with capacitor stages cannot fully respond to today's enterprises where capacitive characteristic loads and rapidly changing reactive loads are widespread.

The system consists of Smart SVC Relay that can activate both capacitors and shunt reactors, Shunt Reactors and Thyristor Driver that activates these shunt reactors.

What are the Advantages of the SVC System?

- You do not need to use a large number of monophase steps (capacitor/reactor, contactor, fuse, etc.).
- Compensation maintenance period is extended and maintenance costs are reduced.
- Since switching is done with thyristors, the response can be generated in 20ms.
- Shunt reactors (inductive coils) can be activated at the desired power for each phase and the reactive need of the system can be fully met.



General Features

RKR S12 / S18 Relays compensate each phase of the operation independently of each other, while measuring and displaying currents, phase-neutral and phase-phase voltages, frequencies, active and reactive powers, current/voltage harmonics, angle differences between current and voltage and many similar line quantities of 3 phases. In addition, it measures and records active and reactive energies in both directions. Demand and peak values for these measured quantities are also recorded in the SVC Reactive Power Control Relay and displayed on the device. Many necessary adjustments related to the device (Current Transformer Value, Measurement and Busbar Voltages, Response Times, etc. dozens of parameter values) can be made via the menu. Thanks to the communication feature, all read parameters can be monitored remotely via the standard Modbus protocol and settings can be made for writable ones.



Technical Features

- ▶ Ergonomic design with 48mm depth
- Personalized screensaver in waiting mode
- Bidirectional compensation
- ▶ Harmonic measurement between 1-63
- 0.5 mA Measurement accuracy
- Ability to operate in the absence of phase
- Automatic current-voltage matching at installation

- > SVC steps with 10000 steps resolution
- Installation and compensation option with single current transformer
- AC/DC supply control, settings and warnings for grouped step partners
- Real time clock
- > Measurement and warning of approximate panel temperature
- Rich event/warning/error codes with date and time signatures
- Turkish and English language support



OUR COMPENSATION SOLUTIONS

1. Classical Compensation



have capacitive reactances. Compensation contactors are used for the switching process of capacitors and shunt reactors in the classical compensation system.

factor by balancing the reactive power of inductive loads, since they



2. Compensation with Driver (SVC)



SVC Reactive Relayo-Current Transformerso NH Fuse with Load Break Compensation Contactoro SVC Load Drive o-Three Phase Capacitoro-Monophase Shunt Reactoro-

Compensation system with driver is a new system developed in response to the fact that classical compensation systems with capacitor steps cannot fully respond to today's enterprises where capacitive characteristic loads and rapidly changing reactive loads are becoming widespread. The system consists of an SVC compatible relay that can activate both capacitors and shunt reactors, shunt reactors and a thyristor driver that activates these shunt reactors.





3. Harmonic Filtered Compensation

Smart Relay
 Current Transformers
 NH Fuse with Load Break
 Compensation Contactor
 Three Phase Harmonic Filter
 Three Phase Capacitor



Harmonic filter compensation is used to reduce harmonic voltage disturbances caused by harmonic currents and to correct harmonic problems in the power system. It is widely used in industrial plants and large-scale commercial facilities.

In this method, harmonic filters are used in addition to compensation equipment. Harmonic filters absorb or block harmonic currents and prevent the spread of harmonic voltage distortions. In this way, it reduces the negative effects of harmonics on the system by preventing resonance in the first place and compensation is performed more effectively.

4. Thyristor Compensation



- Thyristor Output Smart Relay
 Current Transformers
 NH Fuse with Load Break
 Static Contactor
- -o Three Phase Harmonic Filter
- -o Three Phase Capacitor



Since the load change is very fast in enterprises with fast loads (spot welding, crane, etc.), power contactors cannot respond quickly enough to the reactive need. For this reason, static contactors are used instead of power contactors in enterprises with fast loads. Capacitive static contactors prevent high switching currents by switching at the moment when the capacitor voltage and bus voltage are equalized. In addition, it ensures that the reactive needs of fast loads are met by switching very quickly without waiting for the capacitor discharge time.



OUR COMPENSATION SOLUTIONS

5. MV-Referenced Compensation



In enterprises where the meter is at medium voltage, the measurement and response sensitivity of the compensation system designed for high powers is insufficient at low power consumption. The phase imbalance observed in the idle transformer causes both inductive and capacitive distortion of the reactive energy on the medium voltage side. In addition, long lines between the meter and the transformer cause capacitive effect. For these reasons, it is important to receive the current information from the medium voltage side and to use the SVC system in terms of measurement and response accuracy.







OUR COMPENSATION SOLUTIONS

6. Compensation in GES Systems



The meters in solar power generation facilities keep the active, inductive and capacitive index values separately while generating energy during the day and consuming energy at night. Therefore, when designing the compensation system in solar power generation facilities, attention should be paid separately to both the production of energy during the day and the consumption of energy at night. Grup Arge Reactive Power Compensation Relays follow the flow direction of energy bilaterally and continuously and make the moves required by the system quickly with the steps connected to it. In Solar Power Plants; when electricity is not generated, the consumption and power transformers that occur due to internal needs lead to reactive energy consumption. Low active consumption due to the equipment used results in exceeding the reactive energy limit. The reactive energy generated is compensated by using Smart SPP Relays and Smart SVC system and the problem is solved.









"Innovative Solutions in Compensation and Energy Efficiency."

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