SIMETAL^{CIS} PQ

Controlling system perturbations in steelworks – for a clean and stable voltage

With SIMETAL^{CIS} PQ ("Power Quality"), Siemens offers complete concepts for the quality of the power supply in the metals industry that allow for the special interactions between process and power supply system. The solutions are based on the detailed knowledge of your processes that we have accumulated from the over 106 SVC (Static Var Compensation) systems delivered to steelworks with a total output of 6.800 Mvar.

Your Challenge

As the largest consumers of electricity in steelworks, electric arc furnaces are a major cause of system perturbations. These take many forms including, for instance, voltage distortions due to harmonics, voltage variations caused by large, abrupt changes in active and reactive power, as well as flicker and voltage unbalances.

Power supply companies usually set limits for system perturbations of this kind, as they can seriously impair the quality of the voltage supply for other customers connected at the same PCC (Point-of-common coupling). Penalties are imposed if the threshold values are exceeded, and in extreme cases the entire steelworks may be disconnected from the supply. Even in production itself, system perturbations due to electric arc furnaces can cause increased stressing or even malfunctioning of connected operating equipment.

Our Solution

SIMETAL^{CIS} PQ is an end-to-end solution focused on all aspects of your plant and the overall supply system. Our key function is to correctly assess and take into account the system perturbations caused by your plant in conjunction with the network configuration.

Depending on the individual constellation between plant and supply system, we can provide you with a custom-tailored SVC with the best possible price/performance ratio.

SIMETAL^{CIS} PQ ensures a clean, stable voltage, for "green field" projects or plant modernizations alike. Our fine-tuned range of services guarantees you a high-performance solution over the entire life cycle.

More power for the furnace and for a clean bar – design and function of the SVC

The SVC system is connected directly to the furnace bus-bar and consists of

- a set of filter circuits
- a thyristor-controlled reactor (TCR)
- a combined system for control, regulation, protection and signaling.

The filter circuits are tuned to specific harmonics. At the fundamental frequency (50 Hz) they act in the same way as capacitors. This improves the power factor with a corresponding saving of energy and the capacity of transmission components can also be used more effectively.

The TCR consists of a 3-phase thyristor valve with series-connected reactors. Each phase of the TCR is individually controlled so that the total reactive power from electric furnace and TCR is approximately equivalent to the capacitance of the filter circuits at all times. The consequences: more power is fed into the electric furnace with correspondingly shorter power-on and tap-to-tap time.

The control and interlocking system, the result of our many years of experience – prevents incorrect operation and provides reliable protection for the plant. A highly developed control algorithm reduces the flicker generated by the electric furnace.

90 % fewer components – maximum operating reliability through innovative LTT technology

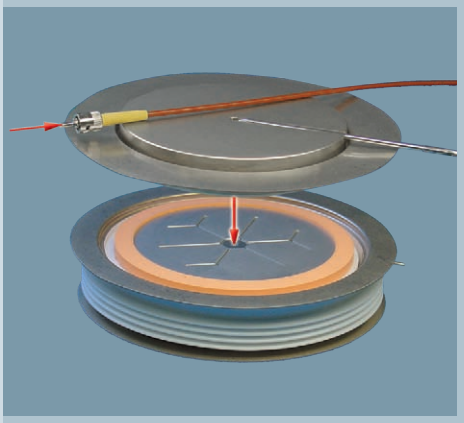
Siemens is the only supplier of thyristors with direct light triggering (LTT Light Triggered Thyristor) and integrated thyristor protection in the world. This cuts by about 90% the number of components normally used in a thyristor module, resulting in an unprecedented level of operating reliability.

The arrangement of the LTTs in a specially designed horizontal thyristor stack enables thyristors to be exchanged in less than 10 minutes.

Quiet and compact – with the optional TCR iron-core reactor

The TCR reactors are also available in the form of iron-core reactors – again only from Siemens. This option provides a good solution when space is at a premium and in difficult environmental conditions, and offers a number of advantages over conventional solutions:

- compact construction
- quieter working
- fewer losses
- freedom from maintenance
- no magneting field develops outside the tank



Good reasons for SIMETAL^{CIS} PQ

- **Improved energy supply** to the electric furnace for shorter power-on and tap-to-tap times, reduced electrode consumption and higher productivity
- **Compliance with the limit values** of the power supply company, so no penalties or production restrictions
- **Unprecedented operating reliability** and availability thanks to LTT technology
- **Also suitable for use in restricted spaces** and under harshest environmental conditions, due to the TCR iron-core choke
- **Amortization usually within a few years**

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Order No.: E10001-M6-A5-V1-7600 Printed in Germany Dispo No.: 216 16 K No.: 28107 GB 080882 02090.0