

# GRIDCON® STATCOM – REDUCED FLICKER DURING RADIATOR PRODUCTION.



Foto: Marcel Wende, Dingelstädt

H.M. Heizkörper GmbH, headquartered in the Thuringian town of Dingelstädt, produces and sells top-quality radiators around the world. The production process for radiators requires spot welding and longitudinal seam welding, which involves multiple welding lines with rapid load changes in the millisecond range. The voltage fluctuations in the 20 kV grid caused by the currents of the highly dynamic welding process are stabilized by a GRIDCON® STATCOM from MR.

Modern production with welding machines and presses in five process lines was causing power quality problems (voltage fluctuations and flicker) for the responsible distribution network operator. A solution had to be developed as soon as possible in order to provide the necessary power quality to all connected consumers in the 20 kV grid.

During the planning phase, MR conducted extensive preliminary measurements at different load cycles. Those results were then fed into network calculations, which formed the basis for designing the dynamic compensation using power electronics. In order to calculate the necessary flicker reduction, a combination of complex simulation tools (PowerFactory,

PLECS) was needed to map STATCOM's highly dynamic control response. Furthermore, an economic feasibility study demonstrated that a centrally installed compensation system with 3 MVar of installed power would be the best solution with the most flexibility for production compared to a number of decentralized systems.

Since the system was set up in a part of the factory through which people walk and drive, the decision was made to install it in a concrete station, in particular for safety reasons. In addition to protecting people, this design also ensures that the installation's value will be retained in the long term. ▶



In the tested, factory-made system, water-cooled power electronic modules in five cabinets are connected to the 20 kV grid via a 20/0.66 kV dry-type transformer.

A particular advantage for the customer is provided by the expandable design of the installed 20 kV switchgear. By adding up to two additional switchgear panels, the station supplied by MR can be used for distribution within the internal network to supply future plant sections.

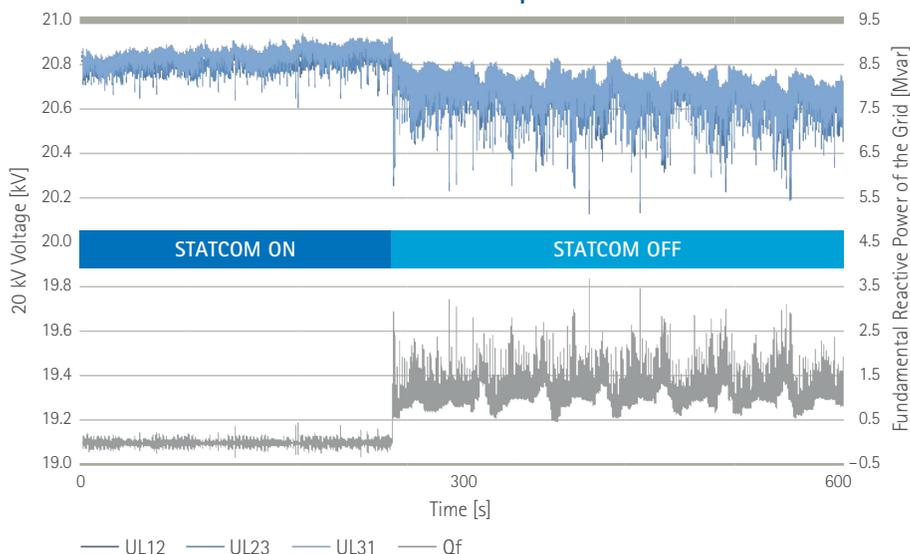
Clear voltage stabilization can even be seen with the naked eye in the voltage and reactive power curves, which are based

on measured values of 10 ms. In the statistical evaluation, this stabilization is expressed in a substantially reduced flicker strength in the 20 kV grid.

The distribution network operator's requirements for power quality are met and, as another benefit, there are no longer any additional reactive power costs.

The solution to the customer's problem was completed as a turnkey project with complete planning and supply, including the foundation, cable, and ground work. The high degree of prefabrication allowed it to be commissioned rapidly.

### 10 ms r.m.s. curve (measurement) of the 20 kV voltage with and without STATCOM in operation



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