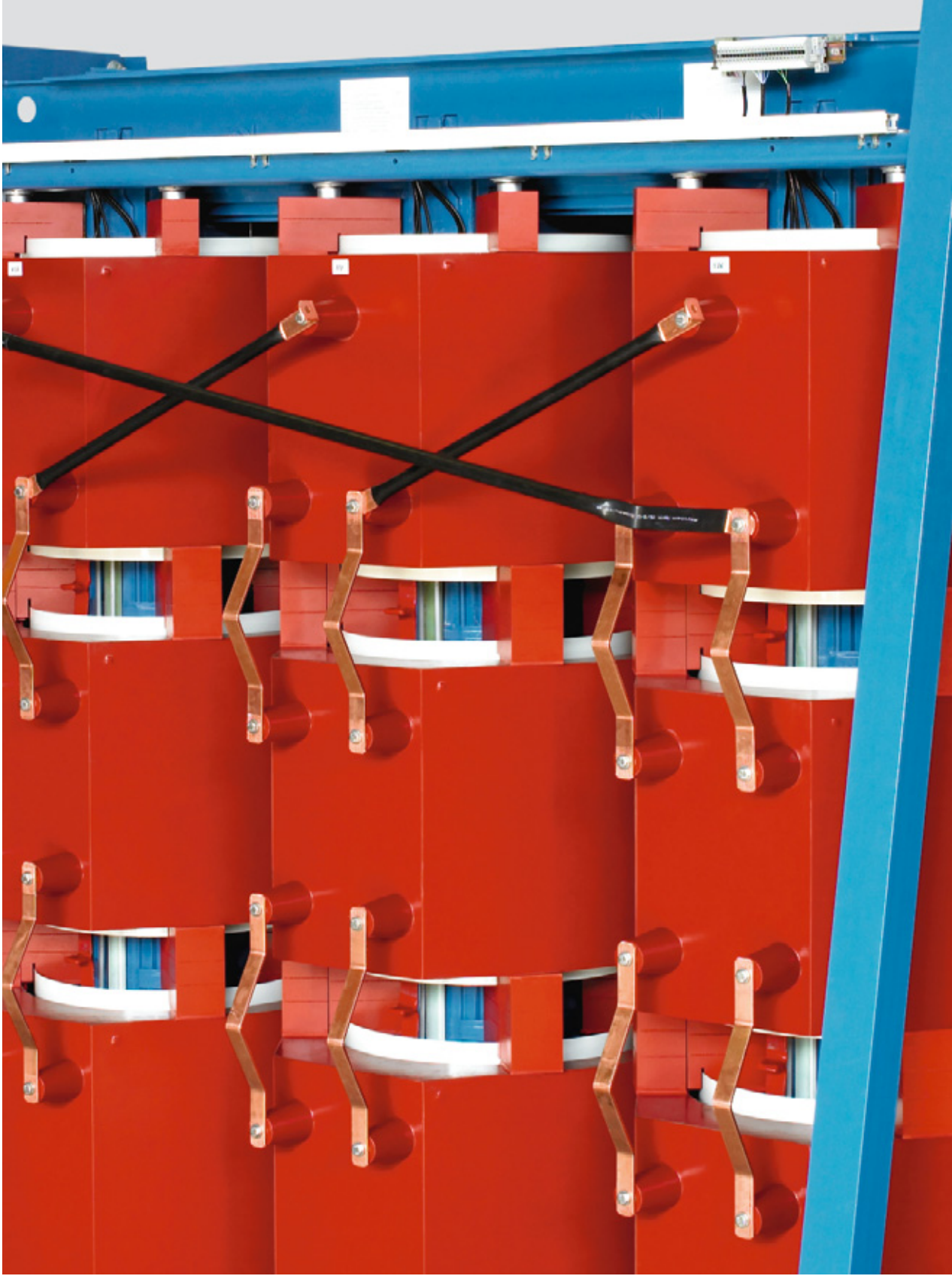


Transforming superior technology into reliable quality. Siemens Transformers.

GEAFOL converter transformers for your drive

Answers for energy.

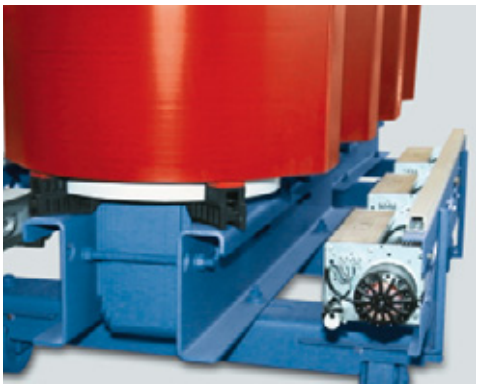
SIEMENS

GEAFOL Static Converter Transformers –

In Use Worldwide

The advantages of GEAFOL:

Wherever space is limited and there are high demands when it comes to safety and awareness of environmental aspects, the use of GEAFOL static converter transformers offers many advantages for planning and installation. That's because flexible, environmentally friendly GEAFOL technology allows transformer installation directly at the consumer load center.



Up to 50% increase in the rated power by installing radial-flow fans.

For the use in the Priobskoye oil field in Western Siberia: 7.5-MVA static converter transformers in two-tier design, 35 ± 2 x 2.5%/ 2 x 2.2 kV. Designed for ambient temperatures as low as – 55°C. Certification compliant with Gost standard. The transformers are installed on a platform with pile foundation.

Static converter facilities with appropriate valves are required to transform and control electric energy for drives. Static converter transformers provide the link to the supply network.
These special transformers are particularly suitable for applications such as heavy-duty drives for steel mills, oil rigs, off-shore installations and conveyance facilities, and for the variety of uses for drives in industry. These transformers are also ideal for the power supply of DC-powered light rail systems – e.g., underground trains and trams as well as the Transrapid.
The circuit of the static converter transformer is adapted to that of the static converter. Its windings are designed to cope with the stress and the current curves generated during the operation of the static converter. The static converter transformer is subject in particular to the following influences specific to the drive and the static converter.

Heavier dynamic and thermal stress due to the rapid changes in load.
Unlike the design of standard distribution transformers, the design of static converter transformers must allow for frequent start-up loads.

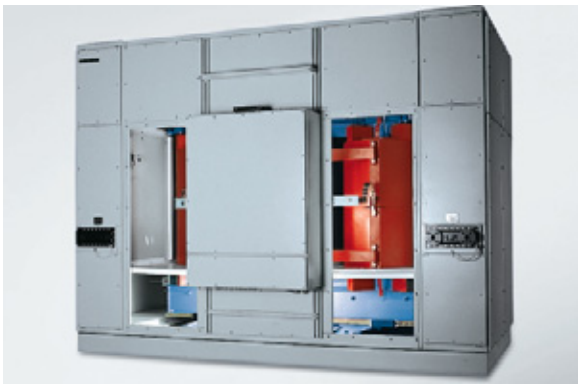
The advantages of GEAFOL® technology:
Vacuum casting of windings and the prepreg system for LV ensure reliable absorption of radial and contraction forces. The LV strip winding reduces axial short-circuit forces to a minimum. The high short-circuit withstand capability thus achieved makes the transformer insusceptible to the stress caused by frequent drive peak loads. Another positive factor is the great heat capacity and thus the high overload capability of this type of transformer.

GEAFOL –
For Highest Load Capability

4.9-MVA GEAFOL static converter transformers for a gold mine in South Africa 1700 m below ground at an air humidity of 90%.

GEAFOL technology for a cold rolling mill in Russia: 6.1-MVA static converter transformers 10 ± 2 x 5%/ 2 x 0.78 kV, switching Dy5Dd0.

GEAFOL –
Suitable for your Drive



Highly efficient cooling system for the "Grand Princess": Eight GEAFOL converter transformers supply the diesel-electric propulsion system of the "Grand Princess" with an output of 9150 kVA each.

A higher thermal load on the windings due to harmonic content in the load current.
The static converter imposes a harmonics-ridden current curve form on the transformer. The distorted stray field gives rise to higher eddy current losses (stray losses). The radial height of the conductor particularly affects the stray losses, which may be up to the fourth power.

The advantages of GEAFOL technology:
Low radial conductor heights (foil thickness) give rise to extremely low stray losses.

Thermal overloading of the core and the clamped parts caused by disturbance in the static converter.
Asymmetric pulses in the static converter generate a DC current component in the load current of the transformer. The resulting changes in flow behavior are an additional strain on the core, structural parts and windings.

The advantages of GEAFOL technology:
Harmful overheating of the core and clamping parts is detected by monitoring the temperature of the tie bolt (connecting top and bottom clamps) at the core circuit.

Higher electrical load due to steep voltage peaks.
This load increase is taken into account by appropriate insulation of the windings. In addition, the high freedom from partial discharges (up to at least double the rated voltage), which far exceeds existing standards, ensures the high reliability of the transformer during operation.

GEAFOL transformers of the static converter type for drives are available for power ratings up to 40 MVA and voltages up to U_m = 36 kV. Adapted to the circuit of the static converter, these special transformers are made primarily with Dy5 circuit, or Dy5Dd0 for two-tier design. Required phase shifts are also possible with GEAFOL technology by installing shift-tip windings. Three-tier GEAFOL transformers are preferably used in modern direct converter installations. Rated power can be raised by up to 50% by installing a radial-flow fan.

One of the largest static converter transformers built using GEAFOL technology: 12 MVA, 11 ± 2 x 2.5%/2 x 3 kV, Dy1Dd0 for driving large pumps.

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Power Transmission Division
Order No. E50001-U413-A59-V4-7600
Printed in Germany
Dispo 19201
TH 101-070060 102361 WS 07082.0

Printed on elementary chlorine-free bleached paper.

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