LIQUID-COOLED DISTRIBUTION TRANSFORMERS

Maximum quality for maximum loads
SGB-SMIT AT A GLANCE

YEARS OF EXPERIENCE
Combined, more than 415
Basis for know-how and for know-why

EMPLOYEES
More than 2,000
take care of your project

COUNTRIES
In more than 80
satisfied customers

READY FOR YOUR MARKET
The SGB-SMIT Group manufactures transformers for applications worldwide. Sales and service centers on all continents ensure optimum processes.

Our products meet the requirements in accordance with the applicable national standards.

PRODUCTS
- large power transformers
- medium power transformers
- large liquid-cooled distribution transformers
- liquid-cooled distribution transformers
- cast resin transformers
- shunt reactors
- series reactors
- phase shifters
- Lahmeyer-Compactstationen®

Transformers from 50 kVA up to incl. 1,200 MVA in the voltage range up to 765 kV.

QUALITY MANAGEMENT
The SGB-SMIT Group is certified in accordance with:
- DIN ISO 9001
- DIN ISO 14001
- DIN ISO 50001
- OHSAS 18001

TECHNOLOGIES
Technologies for conventional and renewable energy.
POWER WHERE POWER IS NEEDED ...

OUR CORE COMPETENCE: THE IDEAL BASIS FOR POWERFUL ADVANCEMENTS.

We manufacture liquid-cooled transformers for distribution networks in accordance with DIN EN 50588. From these, we derive products that can be integrated perfectly in specific applications, e.g.:

- liquid-cooled three-phase transformers for distribution networks of power supply companies
- liquid-cooled three-phase transformers in low-loss design for decentralized energy generation
- liquid-cooled three-phase multi-winding transformers for special requirements
- liquid-cooled three-phase transformers for wind power plants
- liquid-cooled special three-phase transformers for industrial plants
- liquid-cooled single-phase transformers for railway applications
- arc suppression coils
- neutral earthing transformers
- earthing transformers
- liquid-cooled transformers with insulating fluids for special requirements, e.g. fire protection or environmental issues
- controllable local plant transformers

A feeling of reassurance: SBG not only complies with the standards regarding manufacturing quality and occupational safety but also faces up to today’s challenges when it comes to environmental issues.

Awards and certificates reflect the exacting demands we place on ourselves in terms of acting in a responsible manner.

RELIABLE QUALITY
OPERATIONAL SAFETY AND CERTIFICATION

A feeling of reassurance: SBG not only complies with the standards regarding manufacturing quality and occupational safety but also faces up to today’s challenges when it comes to environmental issues.

Awards and certificates reflect the exacting demands we place on ourselves in terms of acting in a responsible manner.

Certified transporting agencies and trucks with special bodies and load-securing equipment

ISO 9001 TÜV
ISO 14001 TÜV
OHSAS 18001

All certificates are renewed on a regular basis
OUR TOP 4

Core, winding, assembly and housing: these four components and production steps are what characterizes our liquid-cooled distribution transformers. They are our “TOP 4”.

THE CORE
QUALITY IS NO COINCIDENCE

The heart of our liquid-cooled distribution transformers: thanks to state-of-the-art production procedures and high accuracy, it beats with particular endurance and power.

This is what distinguishes cores manufactured in-house at SBG:
- cold-rolled grain-oriented metal sheets
- step-lap design
- max. filling factor

These measures reduce no-load losses and no-load currents as well as noise emission.

THE WINDING
PRECISE AND RESISTANT

Maximum resistance to:
- short-circuit load
- overvoltage peaks

The low-voltage winding:
- semi-automated winding machines
- current displacement in axial direction adjusts automatically
- reduced thrust forces
- spark-free and splatter-free cold-pressure welding of outgoing lines
- high-tensile coils thanks to thermal bonding of the prepreg to the conductor material

The high-voltage winding:
- fully or semi-automated winding machines
- lacquer- or paper-insulated winding wire
- constant winding tension
- layer insulation made of high-quality cable paper

SPECIFIC FEATURE

At SBG, the actual parameters of the texture tapes used are measured and recorded prior to core stacking.

SPECIFIC FEATURE

LV insulation meets highest safety standards due to:
- two-layer prepreg as LV insulation material
- constantly tested pressure-welded joints
ASSEMBLY AND DRYING
RELIABLE AND SOLID

Robust and short-circuit proof design of all modules indicate the value of the SBG-transformer.

Assembly of the active part
All components are assembled and mounted in a short-circuit proof manner using pressed components. This results in additional reserves and increased reliability.

Vacuum drying
Drying and oil filling under vacuum as a basis for:
- maximum impregnation of insulating materials
- solid compliance with PD specifications as a prerequisite for an extremely long service life

SPECIFIC FEATURE
At SBG, all active parts are subjected to an electrical pre-test prior to installation in the tank.

TANK & CORROSION PROTECTION
DURABLE AND ROBUST

Most exacting criteria regarding permanent leak-tightness and corrosion resistance.

The tank and cover
- corrugated tank manufactured in-house
- state-of-the-art corrugation plant processes steel-sheet of deep-drawing quality
- after being welded via the welding robot, the tank is tested for leak-tightness

Corrosion protection
- environmentally friendly, hydro-based coating system for various corrosion protection requirements
- coating with paint via immersion process (standard RAL 7033)
- in addition, the tank is hot-galvanized for enhanced corrosion protection

SPECIFIC FEATURE
At SBG, all tanks manufactured in-house are subjected to a fourfold leakage test in accordance with factory-specific standards. This ensures oil-proofness over the transformer’s entire service life!
"TRANSMFORMERS SHOULD BE SEEN AND NOT HEARD"

Reducing transformers’ noise emissions is becoming increasingly important. This is why, in addition to standard design (DIN EN 50588), SBG-transformers are also available with reduced loss and noise levels.

Alongside the selection of the appropriate induction and core material, the method of dovetailing legs and yokes in “step-lap” design has a positive impact on the transformers’ noise emissions and losses.

Routine tests in accordance with DIN VDE 0532

- test with applied voltage (winding test)
- test with induced voltage (turn test)
- measurement of winding resistances
- measurement of transformer ratio and determination of vector group
- measurement of short-circuit voltage and short-circuit losses
- measurement of no-load currents and no-load losses

Type tests and special tests in accordance with DIN VDE 0532

- temperature rise test
- impulse short-circuit test
- noise measurement
- partial discharge measurement

Fault withstand capability

Proof is furnished within the scope of type tests performed by renowned test laboratories.

Protection and monitoring equipment

- temperature
- oil level
- pressure
- gas formation

Special solutions for especially challenging applications

- flat-bar connection system
- electromagnetic compatibility (EMC)
- for converter operation
- for vibration-resistant designs
- integrating application conditions regarding climatic conditions and installation altitudes
# REQUEST FORM

Request information for liquid-cooled transformers in accordance with DIN EN 50588.

To be able to define your transformer requirements, please provide us with the following information.

(Please delete as appropriate)

<table>
<thead>
<tr>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design</th>
<th>Type of installation</th>
<th>Rated power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hermetic properties</td>
<td>Interior</td>
<td></td>
</tr>
<tr>
<td>Expansion tank</td>
<td>Outdoor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High voltage</th>
<th>Low voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>– can be changed over to</td>
<td></td>
</tr>
<tr>
<td>HV-tappings</td>
<td></td>
</tr>
<tr>
<td>Low voltage</td>
<td></td>
</tr>
<tr>
<td>Short-circuit voltage</td>
<td></td>
</tr>
<tr>
<td>No-load losses</td>
<td></td>
</tr>
<tr>
<td>Short-circuit losses</td>
<td></td>
</tr>
<tr>
<td>HV-bushings</td>
<td>LV-bushings</td>
</tr>
<tr>
<td>Porcelain</td>
<td>DIN EN50382</td>
</tr>
<tr>
<td>Plug-in connector, type</td>
<td></td>
</tr>
<tr>
<td>equipped with</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection/monitoring equipment</th>
<th>Corrosion protection</th>
<th>Specific features</th>
<th>Converter operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paint coating</td>
<td>Hot-galvanized with coating paint</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Place, date, company

Please send this form by fax to +49 37600 83-300
or send an e-mail to sbg@sgb-smit.group
Your direct line to Sales and Development: +49 37600 83-0
CONTACT

STARKSTROM-GERÄTEBAU GMBH
Regensburg • Germany
Phone +49 941 7841-0

Sächsisch-Bayerische Starkstrom-Gerätebau GmbH
Neumark • Germany
Phone +49 37600 83-0

ROYAL SMIT TRANSFORMERS B.V.
Nijmegen • The Netherlands
Phone +31 24 3568-911

Smit Transformer Service
Nijmegen • The Netherlands
Phone +31 24 3568-626

RETRASIB S.A.
Sibiu • Romania
Phone +40 269 253-269

SGB Czech Trafo S.R.O.
Frydek-Mistek • Czech Republic
Phone +420 731 601363

SMIT Transformer Sales Inc.
Summerville, SC • USA
Phone +1 843 871-3434

SGB-USA Inc.
Louisville, OH • USA
Phone +1 330 871-2444

OTC Services Inc.
Louisville, OH • USA
Phone +1 330 871-2444

SGB My SDN. BHD.
Nilai • Malaysia
Phone +60 6 799 4014

SGB Transformers India Pvt. Ltd.
Chennai • India
Phone +91 44 45536147

SGB China
Yancheng • P.R. China
Phone +86 515 88392600

www.sgb-smit.com