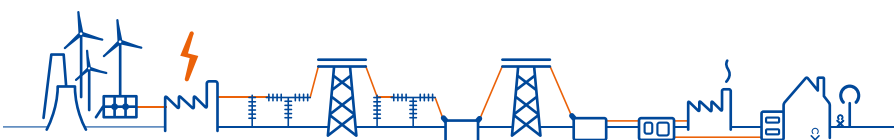


# LIQUID-COOLED DISTRIBUTION TRANSFORMERS

Maximum quality for maximum loads



# SGB-SMIT AT A GLANCE

Combined, more than

# 415



## YEARS OF EXPERIENCE

Basis for know-how and  
for know-why

More than

# 2,000



## EMPLOYEES

take care of  
your project

In more than

# 80



## COUNTRIES

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

## 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



Quality and performance



Environment



Occupational safety BGEM

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 precision, 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.

### SPECIFIC FEATURE

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



## 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

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.



## TANK & CORROSION PROTECTION

### DURABLE AND ROBUST

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



#### 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

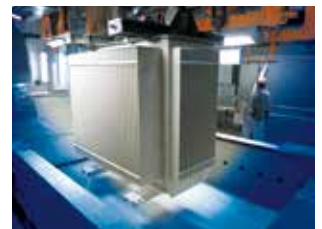
Drying and oil filling under vacuum as a basis for:

- maximum impregnation of insulating materials
- solid compliance with PD specifications as a prerequisite for an extremely long service life



#### 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 active parts are subjected to an electrical pre-test prior to installation in the tank.

### 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!



# TESTS

## “TRANSFORMERS 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.

# ACCESSORIES

Enhanced protection, facilitated monitoring and extended supervision: our transformers can be equipped with accessories and special solutions for even better integration in your application conditions.



### Protection and monitoring equipment

- temperature
- oil level
- pressure
- gas formation



### Shock hazard protection on HV and LV

- HV
  - inner cone-type bushings
  - outer cone-type bushing
- LV
  - terminals with covers
  - cable hoods



### 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]

Quantity \_\_\_\_\_

Design  Hermetic properties  Expansion tank

Type of installation  Interior  Outdoor

Rated power \_\_\_\_\_

High voltage \_\_\_\_\_

– can be changed over to \_\_\_\_\_

HV-tappings \_\_\_\_\_

Low voltage \_\_\_\_\_

Short-circuit voltage \_\_\_\_\_

No-load losses \_\_\_\_\_

Short-circuit losses \_\_\_\_\_

HV-bushings  Porcelain  Plug-in connector, type \_\_\_\_\_

LV-bushings  DIN EN50382  \_\_\_\_\_

equipped with \_\_\_\_\_

Protection/monitoring equipment \_\_\_\_\_

Corrosion protection  Paint coating  Hot-galvanized with coating paint

Specific features \_\_\_\_\_

Converter operation \_\_\_\_\_

Place, date, company \_\_\_\_\_

- ➔ Please send this form by fax to **+49 37600 83-300**
- ➔ or send an e-mail to **[sbg@sgb-smit.group](mailto: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 TRAF0 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