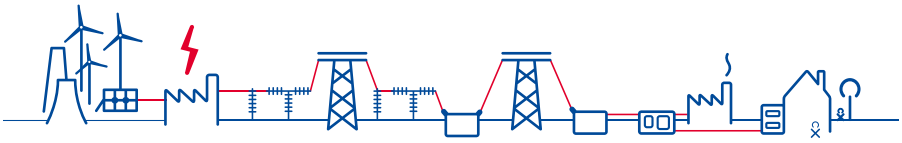
SGB-SMIT POWER MATLA

Your dedicated partner
of the SGB-SMIT Group

DISTRIBUTION TRANSFORMERS TECHNICAL PROFILE



SGB-SMIT AT A GLANCE

Combined, more than

450

YEARS OF EXPERIENCE

Basis for know-how and for know-why

More than

3,500

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.

Status: December 2018

SGB SMIT POWER MATLA
A MEMBER OF THE SGB-SMIT GROUP

SGB-SMIT POWER MATLA has over 70 years experience in successful design, manufacturing, testing, installation and commissioning of a full range of power and distribution transformers which include large power transformers of voltages up to 800MVA.

SGB-SMIT POWER MATLA

SGB-SMIT POWER MATLA (Pty) Ltd is owned by SGB-SMIT (GmbH) and Power Matla.

SGB-SMIT, is the largest independent and pure-play transformer manufacturer in the world, with headquarters in Regensburg, Germany. They are represented on 5 continents in 8 countries with plants in Germany, the Netherlands, USA, Romania, Malaysia, India, China and the Czech Republic. With transformer expertise since 1913 they produce transformers ranging from 50 kVA up to 1,200 MVA.

Power Matla (Pty) Ltd is a locally owned black empowered company with investments in various portfolios within the renewable energy, ICT, mining and power utilities markets providing good shareholder value and solid returns.

The company consists of Large Power Transformers manufacturing plant in Pretoria and Distribution Transformers plant in Cape Town and supplies a full range of transformers, from generator step-up to transmission and distribution transformers. The range includes three-phase and single-phase units, auto-transformers, arc-furnace, locomotive and traction transformers, miniature sub-stations, NECRT's as well as shunt reactors.

"CUSTOM DESIGNED"

Every SGB-SMIT POWER MATLA unit is custom-made from standardised design elements and using uniform manufacturing operations. This flexible, but well co-ordinated approach ensures the highest quality of design and construction for all our transformers and makes the best possible use of the valuable knowledge and experience gained over the years and best practices developed in our factory.

The Large Power Transformer factory in Pretoria is a well-equipped factory and is amongst the biggest and most sophisticated transformer manufacturing plants within the Southern Hemisphere and one of two large transformer manufacturers within sub-Saharan Africa.

The Distribution Transformers factory in Cape Town has been manufacturing distribution transformers and miniature substations for more than 60 years.

SMALL, MEDIUM AND LARGE POWER TRANSFORMERS ALL OVER THE WORLD

OVERVIEW

SGB-SMIT POWER MATLA is one of South Africa's largest and most experienced manufacturers of distribution transformers. Designed, tried and tested under the harshest of African conditions, our distribution transformers and miniature substations have proven themselves for more than 70 years. Our experience ensures our products are manufactured to meet the needs of local conditions, whilst meeting all major national and international standards. Our products are used in utilities, local authorities, mines, industrial plants and all major industries.

Our distribution transformer range starts at 16kVA to 5MVA transformers with primary voltages of up to 36kV and 200kVA to 2500kVA miniature substations with primary voltages of up to 36kV. We also produce neutral eathing resistors (NER's), neutral earthing compensators (NEC's) and NECRT combinations.

QUALITY, HEALTH, SAFETY & ENVIRONMENT

The distribution transformer plant located in Epping 2 (Western Cape) has a fully certified ISO 9001 quality management system, ISO 14001 environmental management system, as well as the ISO 45001 health and safety management system, ensuring stringent quality assurance programmes, in accordance with the very specific requirements is rigidly adhered to. This leads to products of the highest quality

The transformers and miniature substations carry the SABS Mark of Approval. At every stage during manufacturing, the materials and processes are inspected by suitably qualified and experienced inspectors, to ensure all required standards and manufacturing practices are adhered to.

DISTRIBUTION TRANSFORMERS

All distribution transformers manufactured within our factory in Cape Town comply with SANS 780 and/or SANS/IEC 60076.

Distribution transformer high voltage windings are made of copper and aluminium depending on customer specification. The low voltage windings are made of predominantly aluminium foil, but in certain ranges copper or aluminium foil and paper covered strip conductors are used. Diamond dot paper is used for interlayer insulation on the foil windings as this adds mechanical strength. Core and winding assemblies are clamped by means of top and bottom yoke clamps.

All distribution transformer cores are made of grain oriented, low loss magnetic cold-rolled silicon steel. Both sides of steel sheets are laminated with ceramic insulation.

DESIGNS AND MANUFACTURE

Customer drawings are prepared for tender designs and finalised on order placement. All electrical and mechanical designs undergo an internal design review process. External design reviews, by customers are also allowed for, in the design process.

The core construction is optimised for cold-rolled steel properties, so that best parameters for magnetic circuit are obtained, i.e. minimum no-load losses and small magnetising power.

DISTRIBUTION TRANSFORMERS & MINI-SUBS MADE BY SGB-SMIT POWER MATLA

SUPPLY CHAIN

SGB-SMIT POWER MATLA prides itself in our ability to leverage our global network. We also manufacture most of the transformer structural components in-house. Raw materials and components not manufactured in-house are sourced from world class suppliers. Procurement of material and components is done from a list of pre-qualified suppliers, locally and internationally, who are certified to conform with the highest standards in terms of Quality (ISO9001), Health and Safety (ISO 45001) as well as Environmental (ISO 14001) respectively.

Before a supplier is approved, their capability is assessed, by taking into consideration their technical ability; quality control system; safety, health and environmental controls; financial viability as well as other commercial factors. Supply Level Agreements are put in place with key suppliers to ensure availability of stock and continuity of supply. A number of enterprise development initiatives are considered for development of small independent business units.

SGB-SMIT POWER MATLA applies strict control of incoming raw material from pre-qualified suppliers. All incoming goods are quality-controlled and checked before they are released into the sub-assembly manufacturing lines. Where certification is required, the raw material is sent to our on-site SANAS accredited laboratory in Pretoria for material analysis, verification and certification. Any non-conforming product is rejected and returned to the supplier for rectification or replacement.

CORROSION PROTECTION

The exterior and interior surfaces of the transformer tank, cover and conservator (when fitted) are carefully degreased. Rust and millscale is removed by a process of acid pickling or shot blasting.

The exterior surfaces of inland units are thereafter given a coat of high build primer, followed by a coat of high build alkyd base full gloss enamel, giving a total dry film thickness of at least 75µm. The method of application employed is either flow coating or spray painting.

Coastal units are shot blasted and hot zinc metal sprayed prior to painting to a finish of 125µm. Alternatively, twin pack;. three coat system, as used by ESKOM, is also available.

MANUFACTURING PROCESS

The complete active part is processed in an oven to remove excessive moisture content. Following the drying cycle and within a prescribed time, pressure is applied to the windings, the unit is tanked and filled with heated, degassed and purified oil. This takes place under vacuum filling conditions.

On offer is a range of cooling methods such as ONAN and KNAN (Ester fluids).

TANKING

Hermetically sealed transformers incorporate a tank with corrugated or tube radiator fins.

The transformer tank has a sturdy design that allows for normal transportation of an oil-filled transformer without any damage resulting from vibration.

Free breathing transformers have fixed or removable panel radiators and isolating valves.

TESTING

Routine tests according to SANS 780 and SANS/IEC 60076 are made on every transformer prior to despatch:

- Measurement of winding resistance
- Measurement of voltage ratio and verification of polarity and connection symbol
- Measurement of impedance voltage and load loss
- Measurement of no - load loss and no - load current
- Induced overvoltage withstand test
- Separate - source voltage withstand test
- Measurement of paint thickness
- Test for effectiveness of sealing

Type tests to SANS 780 and SANS/IEC 60076 can be undertaken on request:

- Full impulse voltage withstand test
- Full and chopped impulse voltage withstand test
- Temperature rise test
- Tank stiffness test

Special tests to SANS 780 and SANS/IEC 60076 can also be made on request.

- Short circuit withstand test (subject to limitations of SABS high current laboratory equipment)
- Measurement of audio sound level

B-Type miniature substations are complaint with internal arc classification A & B as indicated in SANS62271-202.

The transformer is tested in accordance with the requirements of SANS 780 and SANS/IEC 60076, whilst the LV panel complies with SANS 1973-1,

Low-voltage switchgear and control gear assemblies are supplied for all types of miniature substations

MINIATURE SUBSTATIONS

SGB-SMIT POWER MATLA manufactures a range of miniature substations for various applications and climatic conditions.

We design and manufacture miniature substations for inland and coastal conditions and have a „Beachfront“ design for units exposed to severe corrosive conditions close to the coast. Our inland units have enclosures and transformer tanks manufactured from mild steel and painted to a total dry film thickness of at least 75µm. Mild steel tube radiators are fitted to the units.. The coastal unit enclosure and tanks are manufactured from 3CR12 corrosion resistant steel and fitted with stainless steel tube radiators

The „Beachfront“ miniature substation‘s enclosure is manufactured from hot dip galvanised mild steel, whilst the tank is manufactured from corrosion resistant 3CR12 Steel. This unit is fitted with stainless steel tube radiators with a 3CR12 corrosion resistant steel header. This offers maximum protection for miniature substations located in highly corrosive environments

All our miniature substations carry the SABS mark.

The standard colour for miniature substations is Avocado C12 as specified in SANS 1097, but can be painted in various colours according to the customer requirements. Miniature substations are designed and custom built according to individual customer specifications and requirements.

ECONOSUB

The Econosub is typically a miniature substation where the customer requires an oil ring main unit (RMU). The housing is 1260mm in height compared to the SF6 ring main unit enclosure of 1500mm or 1700mm in height. The housing is dependent on the RMU used.

Each econo miniature substation is designed and custom made and a full range of optional accessories is available to ensure that each and every individual customer’s requirements are met.

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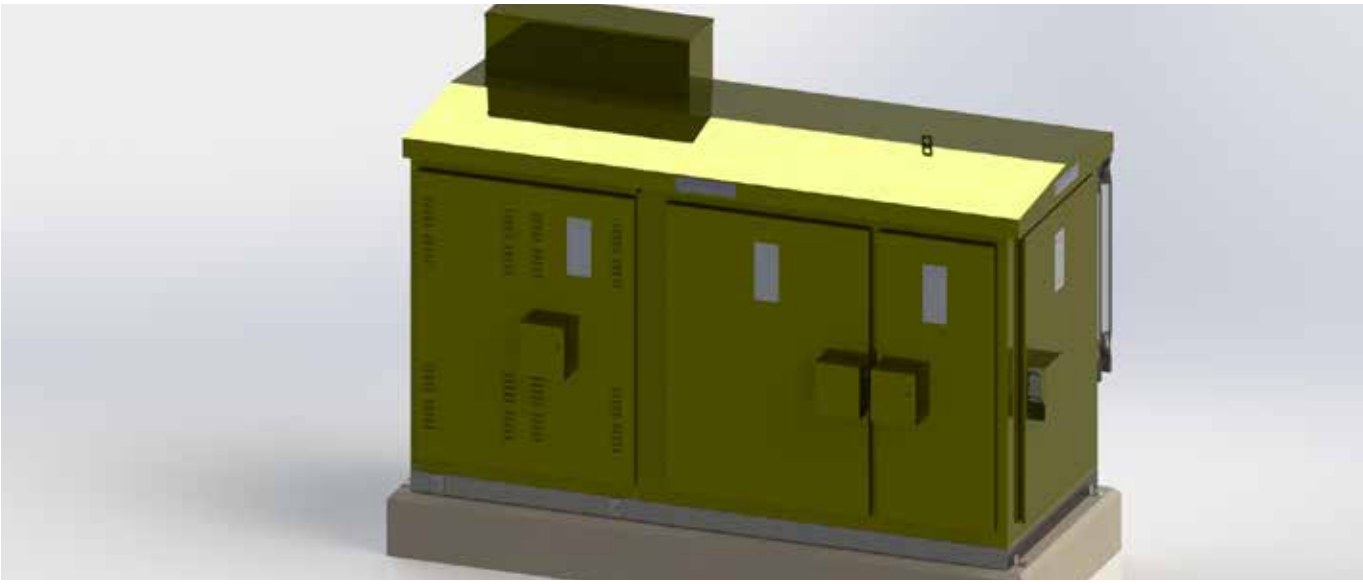


HIGH RISK MINI-SUBSTATIONS

High risk miniature substations manufactured by SGB-SMIT POWER MATLA are identical to the standard miniature substations with the below-mentioned differences:

- The MV and LV miniature substation doors are flush mounted.
- The miniature substation enclosure is manufactured from 6mm Mild Steel.
- All doors are reinforced using additional steel strength members diagonally welded from corner to corner on the inside of the door.
- All doors are fitted with heavy duty hinges.
- A four point locking mechanism (top-centre, bottom-centre, left-centre and right centre) is operated using bars, and is fitted with a heavy duty door handle.

SGB-SMIT POWER MATLA is one of only two suppliers approved by ESKOM to supply this high risk unit.

The high risk miniature substation is designed to reduce vandalism and prevent access to live chambers, which could cause serious injuries or result in fatalities.

Each high risk miniature substation is designed and custom made with a full range of optional accessories available to ensure that we meet every individual customer's requirements.

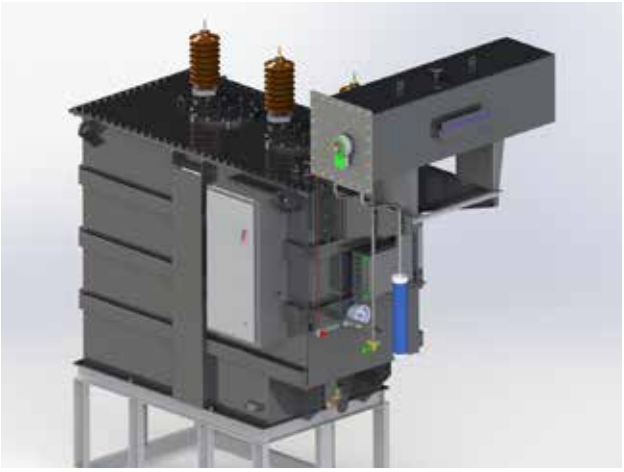
COMBINED NEUTRAL EARTHING RESISTORS

SGB-SMIT POWER MATLA manufactures a range of NER's, LNER's, NECRT's and/or combinations thereof.

Neutral earthing resistors (NERs) are one of the most common types of earthing systems in medium-voltage AC distribution networks. Also called neutral grounding resistors, they limit the current that would flow through the neutral point of a transformer or generator in the event of an earth fault. Short circuits between phase and earth can result in irreversible damage to networks and equipment.

Earthing resistors limit the fault current that arises between phase and earth as a result of short circuits and minimise further damage to switchgear, generators or transformers beyond what has already been caused by the fault itself.

Liquid neutral earthing resistors (LNER's) of voltages up to 36kV and neutral earthing resistors and (Combination Unit) (NECRT) are supplied from our Distribution Transformer factory in Cape Town.



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