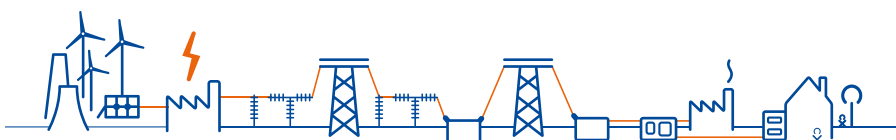


# CAST RESIN TRANSFORMERS



# SGB-SMIT AT A GLANCE

Combined, more than

# 450



## YEARS OF EXPERIENCE

Basis for know-how and  
for know-why

More than

# 3,600



## 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-immersed distribution transformers
- liquid-immersed distribution transformers
- dry type transformers
  - cast resin transformers
  - VPI transformers (conventional and compact core)
- shunt reactors
- series reactors
- phase shifters
- Lahmeyer-Compactstationen (compact substations)

Transformers from 30 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 45001



## TECHNOLOGIES

Technologies for conventional and  
renewable energy.

# ECONOMICALLY EFFICIENT AND CUSTOMER-DRIVEN

Gravity Line by SGB-SMIT comprises various models and power categories of cast resin transformers which can be used for a wide variety of standard applications while completing our standard range for generic applications in the energy distribution sector in a cost-effective way.



## THE PRINCIPLE

The Gravity Line benefits from a new, especially efficient winding system which allows us to pass on the cost advantages derived from manufacture to you directly. At the same time, thanks to features such as the completely vacuum-encapsulated high voltage winding, you can rely on the proven SGB quality and superior operation.

Gravity Line was designed according to the ECO-Design directives (acc. to EU 2009/125/CE) from regulation no. 548/2014. With Gravity Line, we offer you convincing standard solutions which excel thanks to their short lead times and immediate design availability.



### SPECIAL FEATURE

We constantly keep a complete range of transformers from Gravity Line in stock for you. Additional models can be produced and delivered at short notice.

## THE ADVANTAGES

“From design directly to manufacture:” Short routes in development, efficient production methods and standardized specifications enable us to offer you Gravity Line as an especially cost effective transformer solution. Nevertheless, individual solutions are possible here as well:

The additional heating due to operation when encountering inharmonic overloading situations was taken into consideration when designing this transformer series in regards to the thermodynamic dimensioning of the “Standard Converter Operation DIN EN 61378-1 [4.2]”. Various enclosure combinations and accessories are available to optimize your transformer specifically for its application. Upon consultation, technical adaptations of electrical and mechanical parameters and special designs are also possible. Your contact person will be pleased to explain to you all the advantages of Gravity Line!



### SPECIAL FEATURE

Despite all standardization: with Gravity Line, you will receive the specialist support you are accustomed to, from planning right through to interface clarification.

# TECHNICAL PARAMETERS AT A GLANCE



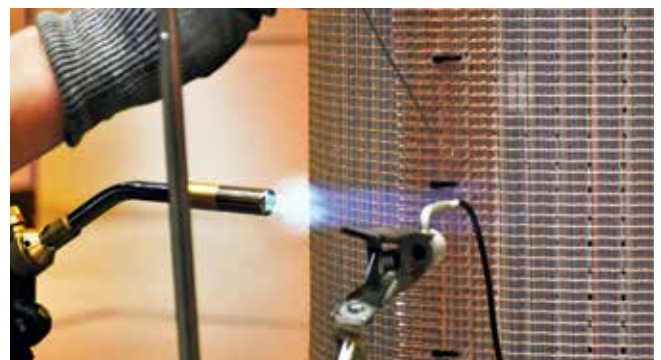
## TECHNICAL DATA

- Design acc. to DIN EN 60076-11 or 50588-1
- Transformer also designed for "converter-operation" under typical conditions acc. DIN EN 61378-1 [4.2]
- HV-winding with smooth, dirt-repellent surface, vacuum-encapsulated to form a compact cylinder (100 K)
- LV-winding "baked" together to form a compact cylindrical body (100 K)
- Surge-proof and short-circuit proof, free from partial discharge (< 5 pC)
- Insulating level F
- Flame-resistant, self-extinguishing (fire classification F1)
- Climate class C4 – valid for operation (-40°C) and storage (-50°C). C2 for transportation (-25°C)
- Environmental class E3
- Winding material: Aluminum
- High-voltage taps:
  - +/-2 x 2.5 % (can be changed over in no-load condition)
- Insulation level (LI) standard according to List 2
- Color: core in RAL 7045; windings in RAL 8017
- Suitable for operation at altitudes up to <math>\leq 1000</math> m above sea level
- Steel clamps and running gear galvanized
- Incl. the following technical equipment:
  - 1 set of castors (lockable in longitudinal and transverse direction)
  - Lifting lugs
  - Earth studs (M12)
  - HT tapings
  - Temperature sensor (PT100/3L in LV winding) routed to terminal strip
  - Second rating plate and vector group diagram
- Documentation:
  - 3D dimension drawing, vector group diagram, terminal arrangement diagram
  - Test report regarding routine tests acc. to IEC 60076-11
  - Documentation of accessories acc. to manufacturers' specifications



## GRAVITY LINE ACC. TO ECO LEVEL 2

| SGB-Type        | Power in kVA | HV in kV | LV in kV | imp in % | Vector | P <sub>0</sub> in W | P <sub>k</sub> 120°C in W | L <sub>WA</sub> in dB | app. length in mm | app. width in mm | app. height in mm | app. weight in kg |
|-----------------|--------------|----------|----------|----------|--------|---------------------|---------------------------|-----------------------|-------------------|------------------|-------------------|-------------------|
| DTTHZ2N 100/10  | 100          | 10       | 0.4      | 4        | Dyn5   | 252                 | 1800                      | 50                    | 1060              | 670              | 1300              | 950               |
| DTTHZ2N 100/10  | 100          | 10       | 0.4      | 6        | Dyn5   | 252                 | 1800                      | 50                    | 1080              | 670              | 1300              | 1100              |
| DTTHZ2N 160/10  | 160          | 10       | 0.4      | 4        | Dyn5   | 360                 | 2600                      | 53                    | 1090              | 670              | 1400              | 1070              |
| DTTHZ2N 160/10  | 160          | 10       | 0.4      | 6        | Dyn5   | 360                 | 2600                      | 53                    | 1120              | 670              | 1300              | 900               |
| DTTHZ2N 250/10  | 250          | 10       | 0.4      | 4        | Dyn5   | 468                 | 3400                      | 56                    | 1162              | 820              | 1394              | 953               |
| DTTHZ2N 250/10  | 250          | 10       | 0.4      | 6        | Dyn5   | 468                 | 3400                      | 56                    | 1203              | 820              | 1394              | 1038              |
| DTTHZ2N 400/10  | 400          | 10       | 0.4      | 4        | Dyn5   | 675                 | 4500                      | 59                    | 1189              | 820              | 1599              | 1296              |
| DTTHZ2N 400/10  | 400          | 10       | 0.4      | 6        | Dyn5   | 675                 | 4500                      | 59                    | 1262              | 836              | 1589              | 1407              |
| DTTHZ2N 630/10  | 630          | 10       | 0.4      | 4        | Dyn5   | 990                 | 7100                      | 61                    | 1315              | 820              | 1714              | 1910              |
| DTTHZ2N 630/10  | 630          | 10       | 0.4      | 6        | Dyn5   | 990                 | 7100                      | 61                    | 1384              | 855              | 1584              | 1737              |
| DTTHZ2N 800/10  | 800          | 10       | 0.4      | 6        | Dyn5   | 1170                | 8000                      | 63                    | 1422              | 858              | 1735              | 2140              |
| DTTHZ2N 1000/10 | 1000         | 10       | 0.4      | 6        | Dyn5   | 1395                | 9000                      | 64                    | 1494              | 980              | 1742              | 2448              |
| DTTHZ2N 1250/10 | 1250         | 10       | 0.4      | 6        | Dyn5   | 1620                | 11000                     | 66                    | 1558              | 980              | 1842              | 2772              |
| DTTHZ2N 1600/10 | 1600         | 10       | 0.4      | 6        | Dyn5   | 1980                | 13000                     | 67                    | 1659              | 980              | 2024              | 3855              |
| DTTHZ2N 2000/10 | 2000         | 10       | 0.4      | 6        | Dyn5   | 2340                | 16000                     | 69                    | 1705              | 1270             | 2264              | 4548              |
| DTTHZ2N 2500/10 | 2500         | 10       | 0.4      | 6        | Dyn5   | 2790                | 19000                     | 70                    | 1883              | 1270             | 2251              | 5213              |
| DTTHZ2N 100/20  | 100          | 20       | 0.4      | 4        | Dyn5   | 252                 | 1800                      | 50                    | 1217              | 769              | 1444              | 1284              |
| DTTHZ2N 100/20  | 100          | 20       | 0.4      | 6        | Dyn5   | 252                 | 1800                      | 50                    | 1204              | 670              | 1404              | 931               |
| DTTHZ2N 160/20  | 160          | 20       | 0.4      | 4        | Dyn5   | 360                 | 2600                      | 53                    | 1157              | 755              | 1444              | 1002              |
| DTTHZ2N 160/20  | 160          | 20       | 0.4      | 6        | Dyn5   | 360                 | 2600                      | 53                    | 1217              | 765              | 1434              | 920               |
| DTTHZ2N 250/20  | 250          | 20       | 0.4      | 4        | Dyn5   | 468                 | 3400                      | 56                    | 1267              | 847              | 1474              | 1358              |
| DTTHZ2N 250/20  | 250          | 20       | 0.4      | 6        | Dyn5   | 468                 | 3400                      | 56                    | 1232              | 843              | 1454              | 1037              |
| DTTHZ2N 400/20  | 400          | 20       | 0.4      | 4        | Dyn5   | 675                 | 4500                      | 59                    | 1265              | 846              | 1644              | 1578              |
| DTTHZ2N 400/20  | 400          | 20       | 0.4      | 6        | Dyn5   | 675                 | 4500                      | 59                    | 1330              | 861              | 1654              | 1621              |
| DTTHZ2N 630/20  | 630          | 20       | 0.4      | 4        | Dyn5   | 990                 | 7100                      | 61                    | 1328              | 820              | 1644              | 1880              |
| DTTHZ2N 630/20  | 630          | 20       | 0.4      | 6        | Dyn5   | 990                 | 7100                      | 61                    | 1397              | 871              | 1634              | 1887              |
| DTTHZ2N 800/20  | 800          | 20       | 0.4      | 6        | Dyn5   | 1170                | 8000                      | 63                    | 1460              | 880              | 1745              | 2275              |
| DTTHZ2N 1000/20 | 1000         | 20       | 0.4      | 6        | Dyn5   | 1395                | 9000                      | 64                    | 1562              | 980              | 1862              | 2731              |
| DTTHZ2N 1250/20 | 1250         | 20       | 0.4      | 6        | Dyn5   | 1620                | 11000                     | 66                    | 1604              | 983              | 1922              | 3180              |
| DTTHZ2N 1600/20 | 1600         | 20       | 0.4      | 6        | Dyn5   | 1980                | 13000                     | 67                    | 1703              | 999              | 2074              | 3972              |
| DTTHZ2N 2000/20 | 2000         | 20       | 0.4      | 6        | Dyn5   | 2340                | 16000                     | 69                    | 1778              | 1270             | 2259              | 4660              |
| DTTHZ2N 2500/20 | 2500         | 20       | 0.4      | 6        | Dyn5   | 2790                | 19000                     | 70                    | 1913              | 1270             | 2261              | 5280              |



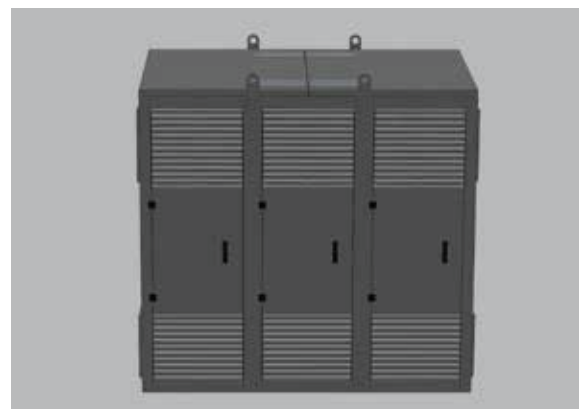
# ENCLOSURES



## Gravity Line – enclosure combination at $U_m$ 24 kV

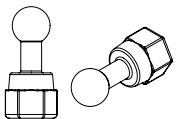
| Transformer   | Housing dimensions<br>mm | Recommended<br>housing | Weight<br>kg |
|---------------|--------------------------|------------------------|--------------|
| 400, 630, 800 | 2100 x 1200 x 2400       | 1                      | 280          |
| 1000          | 2150 x 1250 x 2500       | 2                      | 300          |
| 1250, 1600    | 2300 x 1300 x 2700       | 3                      | 380          |
| 2000, 2500    | 2500 x 1500 x 2700       | 4                      | 480          |

- Recommended transformer/housing combination between IP21 and IP33 without loss of efficiency
- Suitable for AF mode (capacity 140 %)
- Suitable for indoor / floor installation
- Professional service and expert consultation
- Enhanced degree of protection up to IP5X and poke protection on demand
- Outdoor installation and PEHLA protective housing on demand



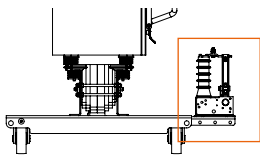
# OPTIONS

## Fixed ball points



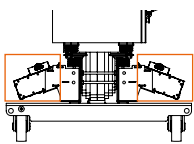
- Internal thread M12, straight model
- Fixed ball point diameter 20 mm or 25 mm
- On HV and LV side

## Earthing switch



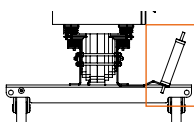
- Mounted to transformer chassis
- Actuation left-hand/right-hand at choice

## Ventilation system



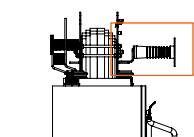
- Capacity increase up to 40%
- To cover brief power peaks

## Surge arresters



- Customer information required re. choice of model


## HV wired to post insulators



- To relieve the mechanical load on the terminals



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