transforma

Distribution transformers
Up to 36 kV / 5 MVA
IEC standards

Reliable innovation.
Personal solutions.
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I. Introduction

Preface

Transfoorma

Dielectric liquid completely immersed hermetically-sealed MV / LV transformer

- Up to 36 kV / 25 kVA - 5 MVA. IEC standards

- Applications: Electric distribution networks, industry, wind farms and photovoltaic plants
- Manufactured 100% in Europe
- +170,000 units in service in +20 countries
- Application: DNS (Distribution Network Solutions for secondary distribution)

Your business and DNS applications

Segments

- Utility
- Smart Grid
- Transmission & Distribution
- Generation

- End Users
- Infrastructures
- Industrial
- Tertiary

- RES
- Wind
- Solar
- Dispatchable RES
II. Main features

Safety
• **Routine** tested according to IEC 60076-1 to all the manufactured transformers
• **Type** testing (customer agreement): temperature-rise / dielectric type tests…
• **Additional** tests (dielectric oil, tank, paint) and **special** tests requested by the customer

Reliability
• **Certification** in internationally-renowned laboratories
• **Own testing capacity:** High Power **laboratory** up to **2500 MVA**
• **Own technology**

Efficiency
• **Hermetically sealed** tank
• **Low noise** level
• **PCB** free materials

Sustainability
• **People safety** and **continuity of service**
• **Optimum** use of **materials, long life** and **robustness**
• **Reduction** in volume of **dielectric liquid, minimal losses** and **low risk of leakage**

Continuous innovation
• **Power** up to **5 MVA**
• Greater variety of **lower losses**
• **Wind** power applications: **transforma.fine**
### III. Technical details

**transforma range**

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<td>transforma.tpc</td>
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<tr>
<td><strong>Rated Voltage</strong></td>
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<td>24 / 36 kV</td>
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<td><strong>Power</strong></td>
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<td>50 – 160 kVA</td>
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<td><strong>Losses</strong></td>
<td>$D_0C_k / C_0B_k / C_0B_k / E_0D_k / A_0B_k / B_0B_k$</td>
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<td><strong>Oil</strong></td>
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- OLTC (On load tap charger)
- Containerized generators
- PV applications
- Auxiliary services in nuclear power plants
- High voltage shore connection systems
- Extended features (>36 kV, >5000 kVA....)
III. Technical details

Technical data

- **Three-phase** transformers
- **Hermetically-sealed** completely immersed in oil
- **Conventional** transformers from 25 to 5000 kVA and up to 36 kV
- **Indoor** and **outdoor** installation
- **ONAN** cooling
- Dielectric **liquids**:
  - Mineral oil
  - **Bioelectra®**: **Natural** biodegradable ester for **organic** transformers
  - Silicone

**transforma.organic**

- Transformers with **Biolectra®** natural ester
  - Developed and patented by **Ormazabal**
  - Dielectric coolant liquid obtained from vegetal oils

- **Natural ester features**:
  - **Excellent** dielectric properties
  - **High fire resistance. K class**: Fire point > 300°C
  - High **biodegradability**
  - **No ecotoxic**
  - **Long service life**: Prolongs the life of cellulosic insulations
  - **Recyclable** and **reusable**
  - Technical **characteristics** and **dimensions** of the transformer are **not affected**
III. Technical details

Non conventional

• **transforma.fine**
  - Small-sized compact transformers
  - highly resistant to high temperatures
  - mineral oil or natural biodegradable fluid (transforma.organic)
  - Adaptability to reduced spaces
  - Specific applications such as wind power generation
  - IEC standards
  - Up to 36 kV and up to 5000 kVA
  - Width ≥846 mm

• **transforma.tpc**
  - Self-protected transformers
  - mineral oil or natural biodegradable fluid (transforma.organic)
  - for indoor or on-pole uses
  - IEC & HN standards
  - mainly for rural network applications
  - Up to 36 kV and up to 630 kVA (transformer substation) / 160 kVA (pole)
III. Technical details

Non conventional

Extended range solutions

- **OLTC** (On load tap changer)
  Transformers that solve the problem of **voltage unbalance** due to **distributed generation**.
  - Up to **1000 kVA** and **24 kV**

- **Photovoltaic applications**
  **Step-up transformers** featured by the multiple energizations carried out per year and low losses.
  - Up to **4000 kVA** and **52 kV**

- **Containerized generators**
  Transformers **multi voltage** and **multi frequency** that allow the adaptation of the electrical supply coming from a **generator**.
  - Up to **5000 kVA** and **36kV**

- **High voltage shore connection systems** (HVSC)
  Transformers with a very **balanced voltage** (voltage variations <3%) for complete power solutions to **supply energy to ships in harbors**.
  - Up to **10000 kVA** and **52 kV**

- **Auxiliary services in nuclear plants**
  Transformers **specifically designed for high requisite environments**, such as auxiliary circuits in nuclear power plants.

- **Extended features**
  - Technical values: **>36 kV > 5000 kVA**
  - **Direct connection** to Ormazabal cubicles
  - Design for **ultra-compact** Ormazabal substations
  - **High temperature** transformers
IV. Design characteristics

Constructive structure

Conventional transformer general view

1. Tank and dielectric liquid
2. MV and LV windings
3. MV plug-in bushings
4. LV terminals
5. Thermometer pocket
6. Ferro magnetic core
V. References

Project References

Main countries with transforma installed:

- Spain
- France
- Germany
- Argentina
- Algeria
- Czech Republic
- Gabon
- Guinea
- Italy
- Morocco
- Nigeria
- Philippines
- Poland
- Portugal
- South Africa
- Sweden
- UK
- Uruguay
V. References

Solution Notes

End Users

- Pumping station in Luanda
  - Angola

La Palma airport
  - Spain

RES

- Renault PV plant
  - France
Thank you!
more information:
www.ormazabal.com
and
social networks

We are launching a new website
Designed for you, letting you know everything about Ormazabal

transforma downloads:

- Brochure: CA-109 / 120 / 337
- Flyer: CA-409