



MV Transformers for
distribution network solutions

transforma.organic

Transformers with natural
biodegradable dielectric liquid

Up to 36 kV 5 MVA

IEC Standards

Reliable innovation. Personal solutions.

Preface

Ormazabal designs, develops, tests, manufactures and supplies medium voltage (MV) distribution transformers (TRs) for decades.

organic transformers with natural biodegradable dielectric are the newest member of **Ormazabal's** wide range of electrical distribution TRs, that are available with a power range from 25 to 5000 kVA, and insulation levels up to 36 kV.

Our commitment to innovation results in type tested products at the internationally recognized laboratories fulfilling the most demanding international requirements. Our customer oriented approach and new technologies allow us to develop more sustainable, more reliable and safer products with higher quality.

In 2010, **organic** type MV distribution transformers (TRs) were developed by using a natural biodegradable ester(*) as dielectric liquid, to provide a safer, and a more ecological alternative with better losses compared to dry type transformers.

Today more than 162 000 nos. MV distribution transformers (TRs) of **Ormazabal** have been installed in the electrical distribution networks of utilities, industrial plants, wind farms and PV solar plants of more than 20 countries.

⦿ (*) Natural ester is a refrigerant dielectric liquid obtained from the vegetable oil. Its formula does not contain any antioxidant additives.

Safety

- » Higher fire resistance compared to conventional TRs
 - High flash point (> 300 °C)
 - High fire point (> 350 °C)
- » Equipped with a K class liquid acc. to IEC 61100.
- » Zero toxicity against aquatic organism

Reliability

- » Excellent dielectric properties with high water content
 - Higher water saturation point
 - High breakdown voltage levels with a high water content.
- » 100 % routine tested at the factory

Standards

IEC 61100 IEC 60076-2
IEC 60076-1 IEC 62770
IEC 60076-3

Efficiency

- » Lower losses compared to dry TRs
- » Identical electrical characteristics as of conventional oil TRs
- » Identical dimensions as of conventional oil TRs
- » Porcelain or epoxy bushing selection for MV connections
- » Customized LV connections (client specification)
- » Long service life thanks to higher water retention capacity of the dielectric liquid

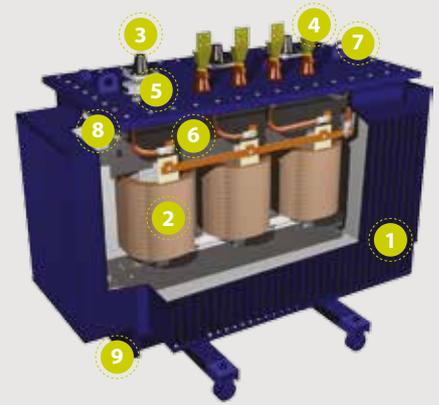
Sustainability

- » Lower noise (10-15 dB less than dry TRs)
- » Usage of not ecotoxic dielectric liquid
- » Recyclable and reusable dielectric liquid
- » High biodegradability

Continuous innovation

- » **organic** TRs for each power and voltage level.

Design



- 1 Tank and dielectric liquid
- 2 MV and LV wirings
- 3 MV plug-in bushings
- 4 Low voltage (LV) terminals
- 5 Thermometer pocket
- 6 Ferro magnetic core
- 7 Lifting eyes
- 8 Latching eyes
- 9 Pulling eyes

Technical data

General

Rated values 7.2 - 12 - 17.5 - 24 - 36 kV
25 - 5000 kVA
50 Hz

Use up to 1000 m* altitude

Ambient T_a: Standard - 5 °C to + 40 °C*

| | Noise | Losses | Environmental impact |
|----------------|-------|--------|----------------------|
| organic | ↓ | ↓ | ↓ |
| Dry | ↑ | ↑ | ↑ |

| | Biodegradability | Fire resistance (fire point temp.) |
|------------------------------------------|------------------|------------------------------------|
| organic range | > 99 % | > 350 °C |
| Mineral oil range (common values) | < 50 % | < 160 °C |

⦿ (*) Other conditions under consultation



Advantages of **organic** TRs compared to Dry TRs:

- » Better losses level: Dry TRs have considerably higher no-load and load losses (This difference can increase annual operation losses about 50 %)
- » Lower noise: Dry TRs have a much higher noise level. (The difference in acoustic power can reach around 10 to 15 dB)
- » Overloadability
- » Higher life expectancy
- » Higher robustness against vibrations, environmental conditions and transient phenomena in electrical network
- » Less space requirement, (Since **organic** TRs do not require a safety perimeter)
- » Better installation options for outdoor applications
- » Lower environmental impact at the end of its service life

