

## ALKARGO TRANSFORMERS SLU

# Power & Inverter Transformers

Alkargo is a reference in development of products in the scope of electrical energy transformation. Alkargo has important international references and a great experience in the technological evolution of the transformer with a wide range of solutions with high reliability and quality. Alkargo is pioneer creating solutions adapted to their customers' needs, thanks to our capacities to adapt the product and the vocation of accompanying customers that characterizes Alkargo.



### Scope of supply

- Distribution, generation, power, rectifying, inverters and traction transformers, in oil up to 100 MVA and 245 kV.
- Tests in transformers, motors and generators in laboratory, with one of the best equipment in Europe.
- Diagnostics and preventive, predictive and corrective maintenance. Spare parts, retrofitting and refurbishing.

### Selected References:

- Alkargo has new facilities state of the art with new lab from HIGH VOLT and Vapor Phase Drying Autoclave HEDRICH, which functions with a quality level and very high energy efficiency.



Since **1966**

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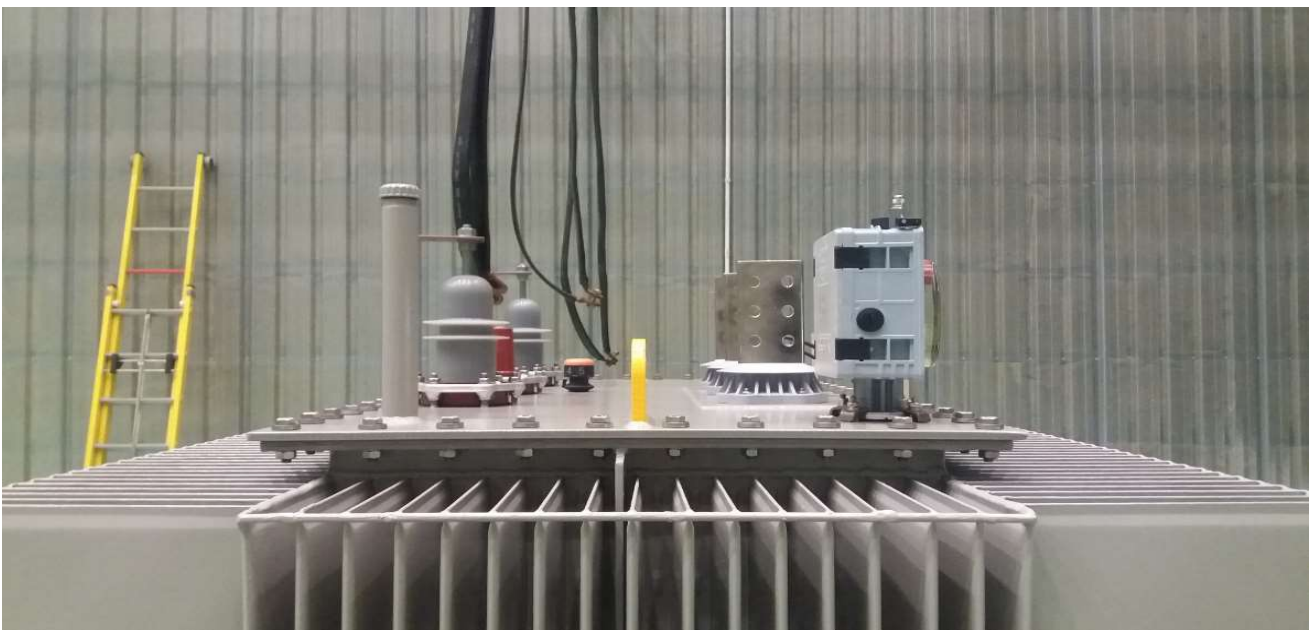
## SOLAR INVERTER TRANSFORMER

Alkargo Transformers is focused nowadays in environmentally friendly transformers and high-grade solar inverter transformers designs adapted to customers' needs and requirements.

Alkargo's range for this type of power transformers includes ratings from 1000kVA upto 7200 KVA and up to 36 and 38kV voltage class.

Inverter transformer is primarily used as a step-up transformer in Solar PV plants from the inverter output to the MV feeding network.

Transformers are designed in low maintenance cost and dimension reduction basis, so that they can be either outdoor installed, or even inside containers or in concrete rooms.

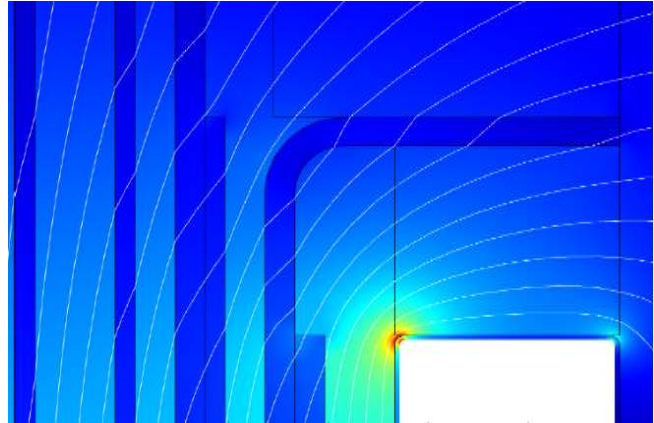
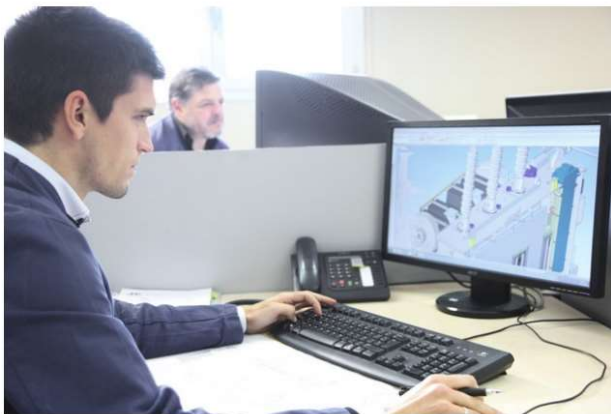


### Technical Features

Power rating	1,000 upto 7,200 kVA
Voltage rating	≤ 36 kV (IEC) and ≤ 38 kV (ANSI)
Frequency	50 or 60 Hz
Oil type	Mineral / Ester
Cooling type	ONAN
Tank type	Hermetic type
LV -output windings connected to inverters load	Up to 3 LV sides
Connection Group	Dy11; Dy11y11 ; Dy11y11y11 or Dy1
Protections	DGPT2 / Pressure relief / pt100
Standards	IEC 60076 / ANSI C57 / EU548-2014 ECO design
Harmonics	Acc IEC61387 and FEM
Conditions	Indoor / outdoor

Transformers for solar inverters could operate at fundamental frequency of an alternating system. AC waveforms produced by the inverter are generally sinusoidal, however a waveform of voltage to ground has a pulsed nature (2 to 3 kHz), and some harmonics and spikes are also present. The inverter transformer needs to be designed to work with the pulse voltage shape of the inverter.

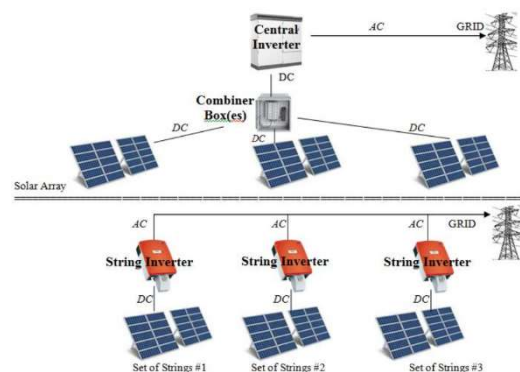
FEM is used in some special cases in order to mitigate possible overheating due to losses increase caused by harmonics disturbance.



In these transformers of the DPV Power generation systems, it is recommended to install electrostatic ground shield between the primary and the secondary windings. The main advantage is that the electrostatic ground shield minimizes the possible transfer of the high frequency voltage disturbances (harmonics, pulsations that are created in the voltage inverting process) from the primary (LV) winding to the secondary (HV) winding and the power system. The electrostatic shield is also filtering the voltage gradient of the pulsed primary (LV) voltage.

It is also recommended to include DETC with range of +/- 5% of the nominal HV winding voltage.

Solar inverter transformers could be designed for one or more outputs connected to inverters and for String or Central inverters, depending on customers solution.



## Experiences

Alkargo transformers is one of the world's leading companies in the field of renewable energy with a strong regional and all over the world presence.

In recent years, Alkargo has developed transformers for Solar and wind application with an estimated size of more than 1000MW, developed for worldwide leading inverter & turbine manufacturers, Distribution network operators and EPCs worldwide. A complete list of references is available on request.



## Our mission

Alkargo Transformers is at the forefront of the energy transition and business sustainability thanks to a strategy, whose priorities are the development of more efficient designs, cost optimised transformers and reduced losses developments for higher efficiencies.

Permanent R&D strategy is implemented, with consultancies at high level, and implementation of tools such as FEM, Tests analysis, prototype developments etc, to improve results and efficiency by a team of designers with more than 15 years' experience in mean term, with transformers and electric machines development.



It is our mission to provide complete solutions in the transformer sector beyond strict compliance with the requirements: legal, regulatory and specific customer requirements. We face this challenge with a mentality that encourages us to continuously exceed our limits and go ahead of our clients' needs, optimizing the management of our internal processes.