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**Transformers**

## Who we are



**CERE** was originally set up as a Certification Entity for Renewable Energies.

**CERE** was created to be the access key on the target countries for Renewable Energies, where certification of components, full installations certificates, modeling and software validation of renewable Power Plants, were required.

The company is accredited as Testing Laboratory and Certification Body.

Our services include Testing and Certification according Safety, EMC, Grid Quality, grid connection requirements, design certification and complete installations Certificates, complementary simulations, modelling validation, electromagnetic transient analysis.

This full process includes Inspection, Testing and Certification of Components such as PV modules, Wind and PV converters, trackers, transformers, string boxes, combiner boxes, etc., and the Certification for full Power Plants according particular country, DSO or TSO requirements and / or According Client Requests

# CERE Profile

The Company is managed by Miguel Martínez. Its team has a large experience in Certification for more than 10 years, including renewable energy's components and installations for worldwide grid integration, design, safety, EMC and grid quality, among others.

During the last 6 years **CERE** has grown exponentially, diversifying its services until the actual company structure:



- Certification
- Converters
- Grid Code & safety
- Simulation
- Trackers
- Batteries
- EMC

- Electrical Vehicle Charger
- Transformers
- Medical devices
- Electric and Electronic devices
- Quality System certification

# CERE Capabilities

**CERE's** Facilities in Getafe, Madrid, Spain have the following installations:

- Test site up to 500kVA for all kind of converters and Battery testing
- Test site up to 250kVA for all kind of converters including frequency variators up to 400Hz
- Test site up to 100kVA for DC-AC converters
- Test site up to 50kVA for all kind of converters and Battery testing. The source can act as DC source and AC source and electronic loads
- Test site up to 10kVA for single phase and three phase converters
- Passive loads up to 100kVA
- Electronic loads for Antiislanding up to 500kVA
- EMC Chamber and EMC laboratory
- Safety laboratory
- Simulation laboratory including Power Factory, PSSE and MATLAB

# What's CERE Transformers department?

**CERE** Transformers is a department created to cover the demand of services for transformers inside of CERE (Certification Entity for Renewable Energies)

**CERE** Transformers was created to provide support and trust at any stage of certification and testing of transformers



Our services include Testing and Certification according Safety standards.

This process includes testing, certification and verification of transformers and their components.

# CERE's Accreditations

- **CERE** is accredited by ENAC and a2La (IAF/ILAC members) as Certification Body According ISO 17065 and Testing Laboratory according ISO 17025 for Power Generating Units. This fact ensures a deep knowledge in international requirements for components and Renewable Energies Power Plants.
- **CERE** is also CBTL and NCB for the IEC Scheme.
- MET approval for the North American market
- Sunspec approval
- SII approval for Israel
- RETIE approved certification body for PV inverters (Colombia)
- Corean Approval



CERE's Accreditation can be checked in:

<http://www.cerecertification.com/accreditations>



# Applicable Standards

**CERE** is accredited as Certification Body and Testing Laboratory for transformers according the following standards:

## Safety Standards for UL Market

Standard **UL 5085-1:2017**: Low Voltage Transformers- Part 1:  
General requirements

Standard **UL 5085-1:2017**: Low Voltage Transformers- Part 2:  
General Purpose Transformers

Standard **UL 5085-1:2017**: Low Voltage Transformers- Part 3:  
Class 2 and Class 3 Transformers





# Applicable Standards

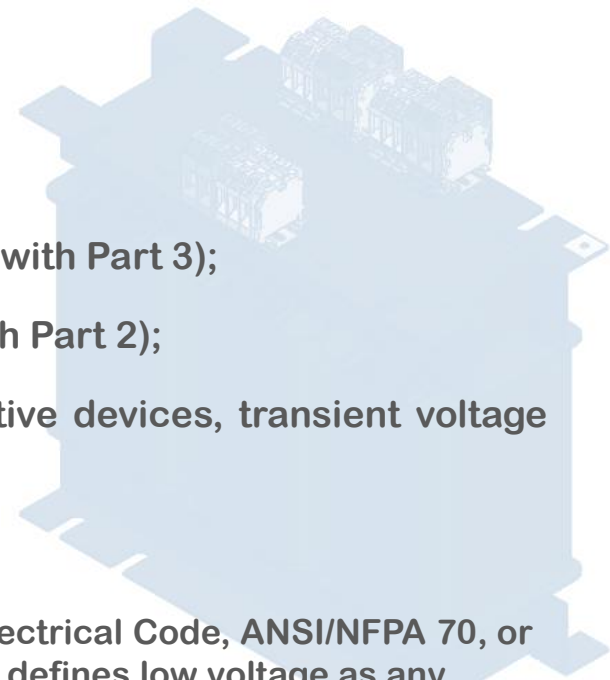
## Scope according standard 5085-1:2017

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These requirements cover the following types of transformers:

- ✓ Air-cooled transformers and reactors for general use;
- ✓ General purpose autotransformers;
- ✓ Ferroresonant transformers;
- ✓ Class 2 and Class 3 transformers (which are evaluated in accordance with Part 3);
- ✓ Cord-connected transformers (which are evaluated in accordance with Part 2);
- ✓ Transformers incorporating overcurrent or over-temperature protective devices, transient voltage surge protectors, or capacitors;
- ✓ Permanently-connected transformers.

These transformers are intended to be used in accordance with the National Electrical Code, ANSI/NFPA 70, or CSA C22.1, the Canadian Electrical Code, Part I. The Canadian Electrical Code defines low voltage as any voltage from 31 to 750 V inclusive and high voltage as any voltage above 750 V. The National Electrical Code, ANSI/NFPA 70, defines low voltage as any voltage up to 600 V, nominal. Therefore, low voltage transformers intended for use in Canada may be rated above 600 V up to 750 V. Low voltage transformers intended for use in the United States are rated up to 600 V. Where information in clauses and tables in this standard reference voltage ranges, the limit of 600 V applies in the United States, while the limit of 750 V applies in Canada.





# Applicable Standards

## Scope according standard 5085-1:2017

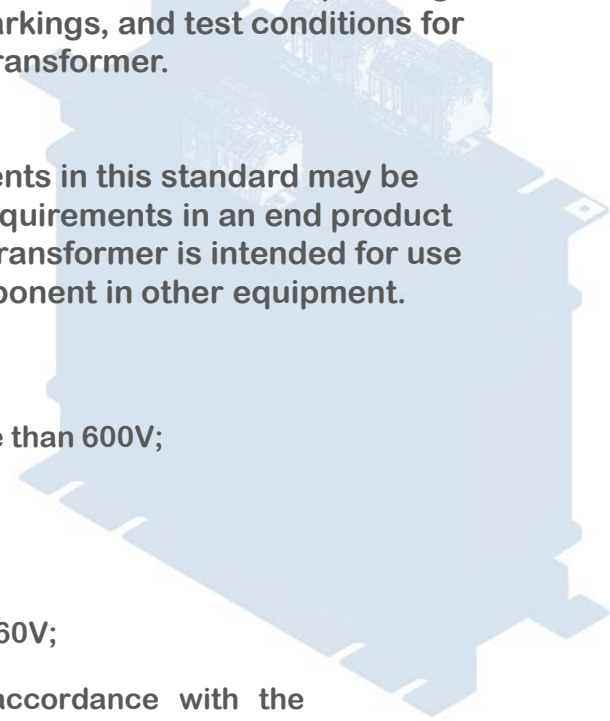
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The standard **does not cover** the following transformers:

- ✓ Direct plug-in types;
- ✓ Neon; Toy; Ignition; Distribution;
- ✓ Liquid-immersed; High intensity lighting;
- ✓ Variable voltage (Variac);
- ✓ Low voltage landscape; Swimming pool and spa;
- ✓ Fluorescent lamp types;
- ✓ Transformers for welders;
- ✓ Transformers intended for use in the United States with a nominal primary rating of more than 600V;
- ✓ Transformers incorporating rectifying or waveshaping circuitry;
- ✓ Transformers for use with radio- and television-type appliances;
- ✓ Transformers intended for use in the United States having overvoltage taps rated over 660V;
- ✓ Autotransformers used in industrial control equipment, which are evaluated in accordance with the requirements of the Standard for Industrial Control Equipment, UL 508, or CSA C22.2 No. 14, Industrial Control Equipment;
- ✓ Other special types of transformers covered in requirements for other electrical devices or appliances.

Part 1, as well as Part 2 and Part 3, establish the characteristics, construction, operating conditions, markings, and test conditions for each type of transformer.

The requirements in this standard may be modified by requirements in an end product standard if a transformer is intended for use only as a component in other equipment.



# Applicable Standards

## Scope according standard 5085-2:2017

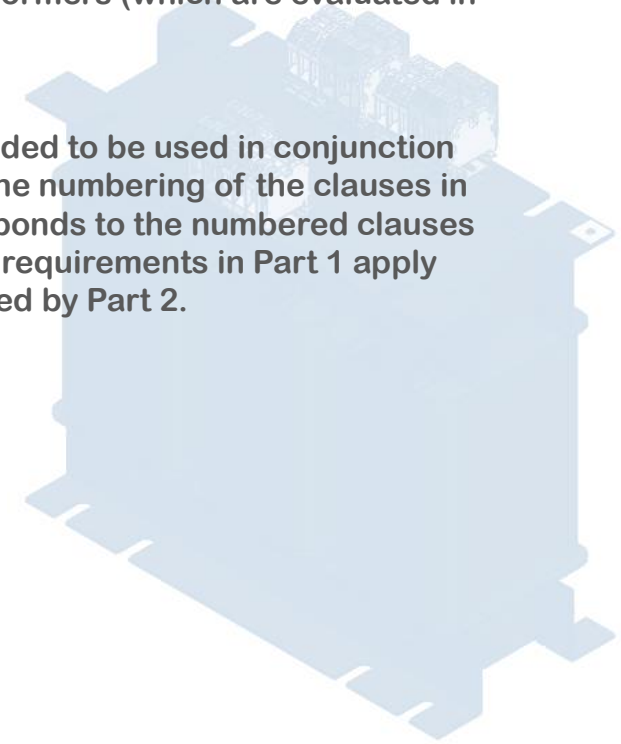
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These requirements cover the following types of transformers:

- ✓ Air-cooled transformers and reactors for general use;
- ✓ Autotransformers;
- ✓ Ferroresonant transformers;
- ✓ Cord-connected transformers;
- ✓ Transformers incorporating overcurrent or over-temperature protective devices, transient voltage surge protectors, or capacitors;

These requirements **do not cover** Class 2 and Class 3 transformers (which are evaluated in Part 3).

Part 2 is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 2 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 2.



# Applicable Standards

## Scope according standard 5085-3:2017

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As noted in Low Voltage Transformers – Part 1: General Requirements, UL 5085-1, or CSA C22.2 No. 66.1, Low Voltage Transformers – Part 1: General Requirements, the requirements in Part 3 cover Class 2 transformers for use with Class 2 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical Code, Part I, CSA C22.1. They are intended for connection to essentially sinusoidal supply sources.

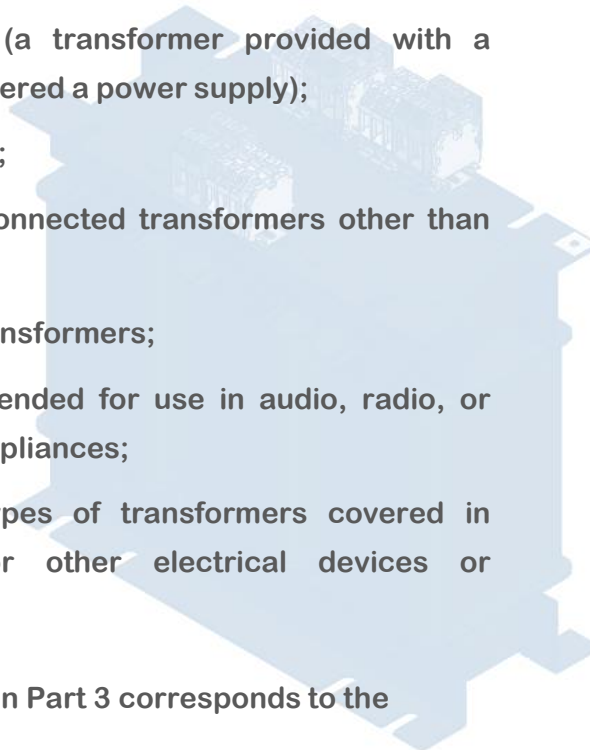
**Advisory Note:** For transformers intended for use in the United States, these requirements also cover Class 3 transformers for use with Class 3 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, unless otherwise specified in this standard. See Annex D for Class 3 requirements.

This part is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 3 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 3.

A Class 2 transformer that includes a separate current-limiting impedance such as a resistor or a positive temperature coefficient device (PTC) is covered by these requirements.

A Class 2 transformer that includes a resonance regulating circuit is covered by these requirements.

The requirements of Part 3 **do not cover:**

- ✓ Power supplies (a transformer provided with a rectifier is considered a power supply);
  - ✓ Toy transformers;
  - ✓ Cord and plug connected transformers other than Class 3;
  - ✓ Direct plug-in Transformers;
  - ✓ Transformers intended for use in audio, radio, or television type appliances;
  - ✓ Other special types of transformers covered in requirements for other electrical devices or appliances.
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# Applicable Standards

**CERE** Transformers has a wide expertise in the field of testing.

Some of the most important projects carried out recently are located in Spain.



The offered testing includes\*:

- ✓ Overload Test (at 200% rated load)
- ✓ Bonding Conductor Test (Earth current test)
- ✓ Spacings and Insulation
- ✓ Mechanical Assembly
- ✓ Temperature (Heating) Test
- ✓ Electric Test (Dielectrics withstand and Induced Potential)

(\* among other test required in the certificates)

# Applicable Standards

## CERE transformers testing

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- ✓ Enclosure Tests
- ✓ Impedance Test
- ✓ Lifting or Mounting Means Test
- ✓ Strain Relief Test
- ✓ Leakage Current Test
- ✓ Power Input Test
- ✓ Short Circuit Test on Transformers with Output Receptacles
- ✓ Maximum Output Power Test on Transformers with Output Receptacles
- ✓ Corrosion resistance
- ✓ Switches, Protective Devices, and Wiring Devices
- ✓ Cord-Connected Transformers
- ✓ Pullout, Bending, and Twisting Tests
- ✓ Insulating Barriers Test
- ✓ Maximum Output Power and Short Circuit Tests for Line Cord-Connected Transformers
- ✓ etc

## Contact us



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