

Cast Resin Transformers

winderpower
power technology



Winder Power manufactures a range of air-cooled, dry type Class 220 insulated transformers, with or without enclosures, which are particularly suitable for use at high temperature and in tunnelling applications.

All transformers are produced in accordance with IEC 60076-11 standards, and in particular they meet requirements for climatic (C), environmental (E) and fire (F) classes:

Climatic class C2:

Transformer suitable for working, transport and storage with temperatures as low as -25°C.

Environmental class E2:

Transformer suitable for working in environments subject to frequent condensation or heavy pollution or a combination of both of them.

Fire class F1:

Transformers subject to a fire hazard. They present a restricted inflammability, low emission of toxic substances and opaque fumes.

The standard offer of Winder Power covers distribution cast resin transformers from 50kVA up to 3150kVA, insulation class up to 36kV with standard or reduced losses (IEC 60076-11).

TPZ3S

(Distribution transformers with standard losses).

TPZ3R

(Distribution transformers with reduced losses).

Our design and construction capacity can satisfy many diverse needs and applications, such as autotransformers, earthing transformers, reactors and earthing transformers, transformers for 6-12-18-24-36 pulse rectifier, HV-HV transformers and LV-LV transformers, three-single phase transformers, triple windings transformers, applications for traction and for testing rooms.

Why cast resin transformers?

Very reduced fire risk

Cast resin mounting materials are less inflammable and can be defined self-extinguishing. There are no special fire prevention coatings, with associated fire conditions, the calorific potential of the cast resin transformer is minimal and there are no dangerous fire gases capable of long-term damage. This advantage is especially useful in installations where safety is fundamental, for instance in hospitals, public premises, airports, subway lines, mines, oil rigs, nuclear power plants and ships.

No special cooling liquids required:

Cast resin transformers only need air for cooling. Liquid coolants of whichever chemical type cannot be released into the environment. There is therefore less maintenance of cast resin transformers, compared to liquid cooled types.

Low operation costs:

The low losses in the magnetic core and in the windings reduce the costs of operation.

Reduced maintenance:

Cast resin transformers are designed to withstand the worst climatic and

environmental conditions. Preventive maintenance consists of a few simple checks.

Advantageous capabilities of the enclosure:

Instead of transformer bays or cable housings, a simple enclosure can be used for access prevention. Enclosures can be complemented with the provision of high voltage flanges and low voltage cabinets to provide local stations.

Unrestricted installation possibilities:

The transformer is a key component in the electrical supply network, and speed of installation can be valuable. A cast resin transformer is easily accommodated, for example, no blast walls are necessary. Consequently, the planning of the installation is simplified and installation costs are saved.

Simple increased performance:

Through optimized forced ventilation there is an increase in performance of about 40%.

High short time overload capability:

The current density in the winding with cast resin transformers is considerably lower than with oil transformers. Short time load peaks, such as with wind power installations, can be

easily overcome without there being a need to plan the relevant over sizing.

High reliability:

The high technology employed in the manufacturing process of windings gives the product a high level of reliability.

Versatility and Performances:

Cast resin transformers can cope well with overloads found in most typical installations.



Magnetic Core

The magnetic core is totally produced in the factory thanks to two cutting lines and five assembly areas. For cast resin transformers, where the No-Load losses and the noise level have primary importance, the magnetic core is always made by grain oriented steel (CRGO) which is cut with "Step Lap" method. In order to avoid the risk of rust, the magnetic core is painted with an epoxy resin with F temperature class. The clamps of the core are usually painted, but under request they could be also hot or cold galvanized.



MV Windings

Medium voltage windings are carried out by automatic machines and comprise a set of electrolytic aluminium or copper tape coils. The insulation between turns is obtained through a polyester film.

One of the characteristics of cast resin transformers is that the conductors of the high voltage winding are completely encapsulated in a cast resin body with a smooth surface. This can only be carried out in moulded formers under vacuum.

The adjustment links (generally $\pm 2 \times 2,5\%$) are obtained directly at the centre of the coil.

LV Windings

The Low voltage cast resin windings are manufactured with an electrolytic aluminium or copper foil conductor together with an insulating film in class "F", and then subjected to the oven drying process.

The outlet terminals are manufactured with aluminium or copper busbars welded in an inert atmosphere and firmly locked to the frame with spacer insulators.



Accessories upon request

Additional accessories can be supplied with the transformers according to customers' requirements:

Forced cooling System:

Completely manufactured in the production hall, this kind of ventilation guarantees a correct forced circulation of the air inside every single column for three phase and single phase transformers. It has been estimated that thanks to the Ventilation system it's possible to increase up to 40%

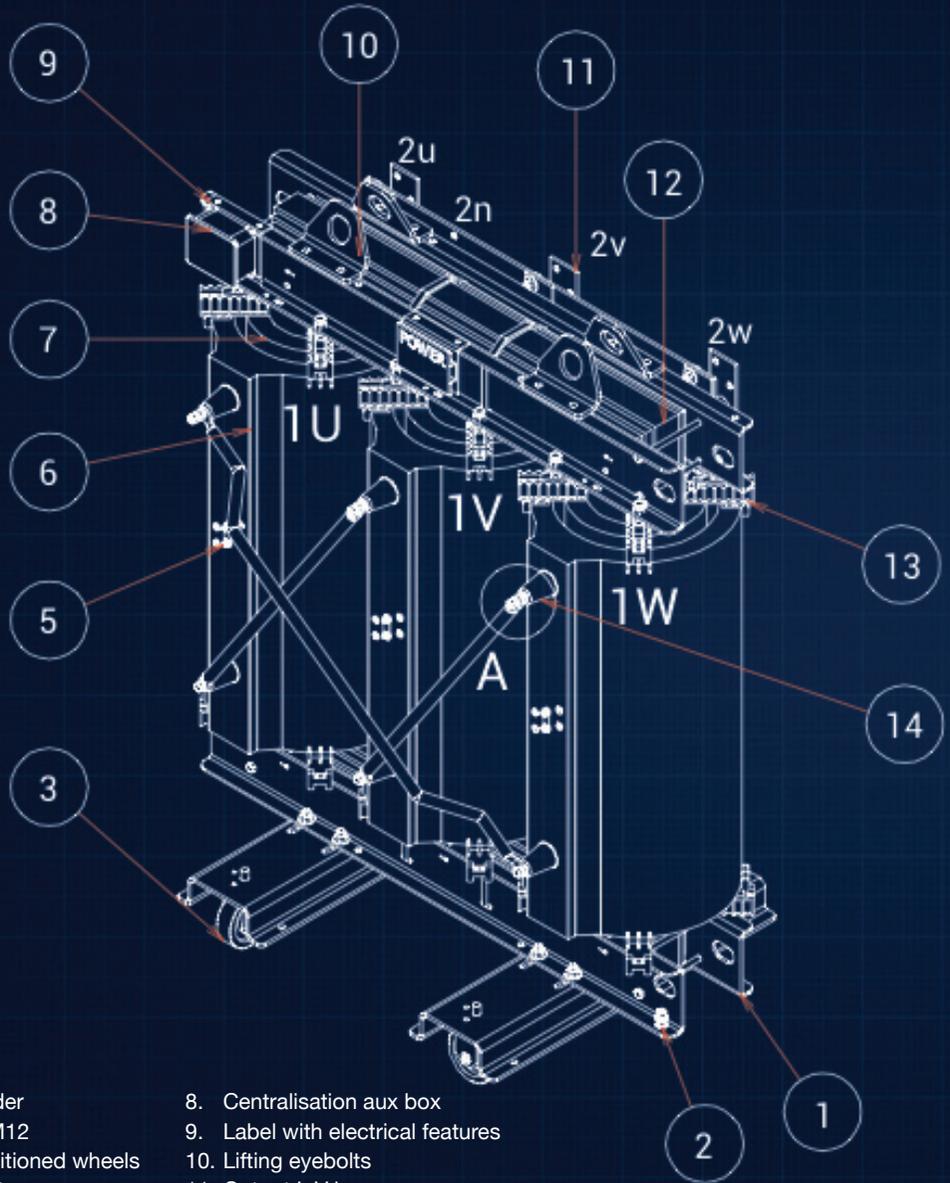
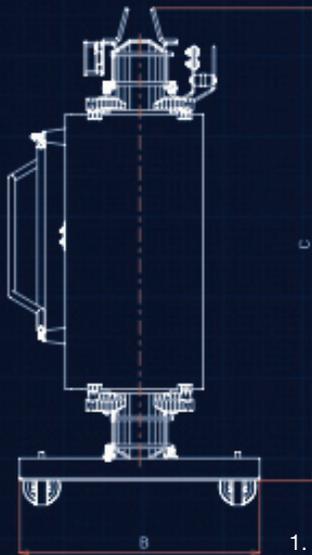
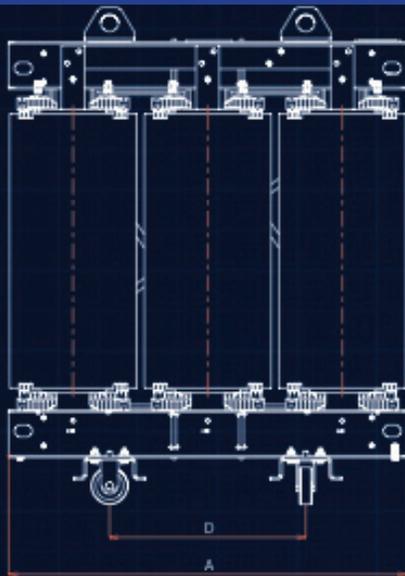
of the power of the transformer (for a short period). Together with the Forced cooling system is suggested the use of PWR12. It's a device specially developed for the control of electric motors, particularly those fitted to the ventilation systems, able to diagnose motor faults by valuating changes in current drawn by the same.

Anti-vibration Pads for transformers wheels:

It's an intelligent, compact and cheap device

with the function of reducing vibrations and noise of the transformers. Where transformers are located in a noise sensitive area, such as hospitals, offices, apartments or buildings, the pads manufactured by Winder Power could be the correct solution against these problems. There are two kinds of anti-vibration pads suitable for standard wheel sizes fitted to the distribution transformers.





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|---------------------------------|-----------------------------------|
| 1. Lamination holder | 8. Centralisation aux box |
| 2. Earth tapping M12 | 9. Label with electrical features |
| 3. Orthogonal positioned wheels | 10. Lifting eyebolts |
| 4. Transfer eyebolts | 11. Output L.V bars |
| 5. Regulation tappings for M.V | 12. Magnetic core |
| 6. M.V windings | 13. Winding pressure plugs |
| 7. L.V windings | 14. Input M.V terminals |

Standard accessories

Standard accessories supplied with all transformers are:

- N.3 PT100 probes for windings temperature
- N.4 lifting eyebolts
- N.4 bidirectional wheels
- N.2 earthing link
- N.1 identification plate
- Tapping terminal board on MV side

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