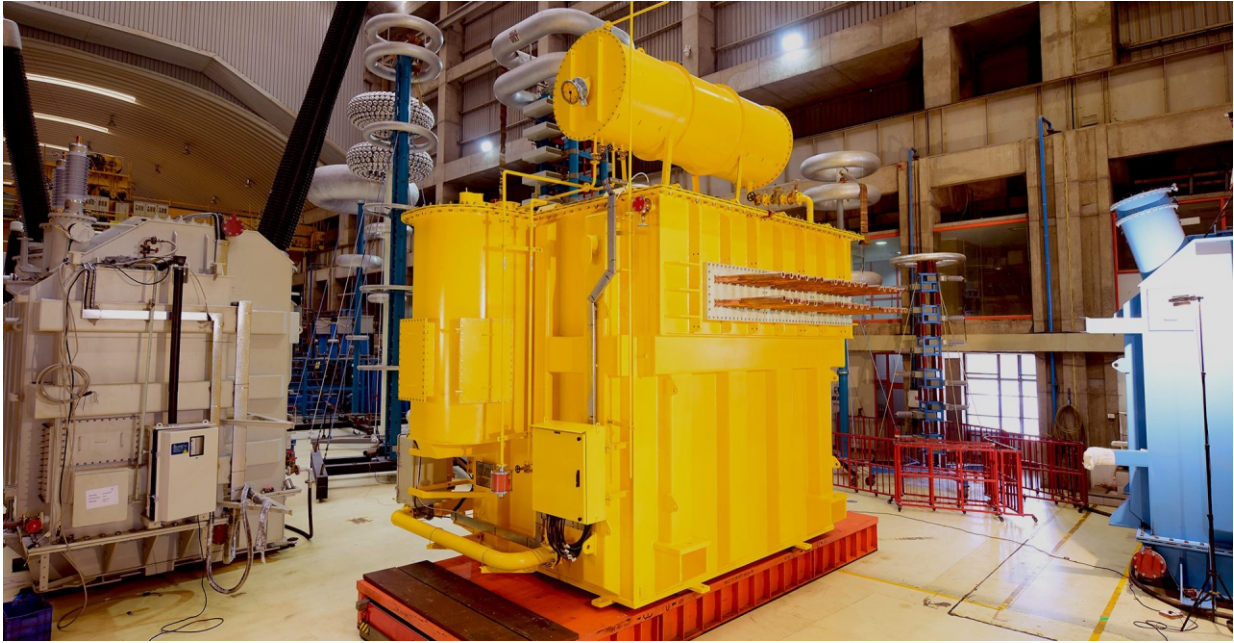


# FURNACE TRANSFORMER



MARSZ manufactures Electric Arc Furnace Transformer (EAF), Submerged Arc Furnace Transformer (SAF), Ladle Refining Furnace Transformer (LRF), Induction furnace transformers & DC Arc Furnace Transformer. Our product range covers 10 MVA and 33kV ONAN / OFWF cooling.

A high current furnace transformer is provided by having the low-voltage windings arranged in a closed delta configuration within the transformer enclosure. Bus bar terminals are mounted exterior to the enclosure for providing electrical connection with the low-voltage windings.

MARSZ Furnace transformers are used to step down from voltages between 11 and 33 kV to levels of several hundred volts only. This results in massive secondary currents. As an example a 30 MVA unit at 150 V would result in a secondary current of 115 kilo Ampere. For these high secondary currents special bushings are required to connect to the bus-bars. These bushings are specified with very specific arrangements to suit the bus-bar arrangement and cooling system. Furnace bus-bars are mostly water cooled. Due to the high secondary currents and resistive losses the furnace layout is such as to limit the bus-bar length.

The MARSZ furnace transformers are located close to the furnace itself and they are single phase units, arranged in a triangle around the furnace. This means that there is a high risk of fire, a high ambient temperature and this whole set up is located at a level associated with the third floor of the building. The location above ground level encourages single phase units due to the structural limitations of the buildings.

MARSZ Furnace transformers are very much used in a production environment. Loading of these transformers is then very close to rated values and even beyond. This demands very reliable transformers.

This in turn calls for good accessibility of the tap changer and other parts of the transformer. Large inspection covers in close proximity to the tap changer are often specified. Due to the nature of the process MARSZ furnace transformers are specified with large tapping ranges. Thirty tap positions is not uncommon. Adding to the wide tapping range is the utilisation of the tap changer. Some users require up to 800 operations of the tap changer per day. This demands high maintainability and efforts to increase the maintenance intervals. On line tap changer oil filters are thus essential. To reduce downtime further, plug-in type diverters are specified. This allows a quick changeover of the diverter switch and an overhaul in a workshop environment with more time at hand.

Another aspect of the process is the large number of short circuits that these transformers are subjected to every day. Transformers associated with open arc furnaces can be subjected to a number of short circuits per melt as the material being melted collapses across the electrodes. Bus-bar flash overs are also a fact of life on most furnace installations. To add to this peril, MARSZ furnace transformers are required to have a lower than normal impedance. This gives rise to higher over-current factors. Very robust design in terms of the transformers' ability to withstand the dynamic effects of repeated short circuits is required. Minimum impedance values for furnace transformers of the core type are in the order of 4 – 5 %. To achieve lower values, one would need a shell type transformer. Upper levels for impedance could be any value from 10 to 24 % depending on the configuration and tapping range.

## **Application in following industries :**

Chemical, Pharmaceuticals, Steel, Textile, Engineering, Plastics, Cement, Refineries, Mining, Captive Power Projects, Hydro Power Projects, Wind Mill Farms, Construction Houses, Electrical, Pharmaceutical, Electronics, Renewable Energy, Automobile Industry.