



TAI DRY-TYPE **MANUAL**

GENERAL INSTRUCTIONS

A - Introduction

The instructions in this manual have been prepared for users of our products, aiming at guiding them as to necessary ***precautions*** and ***procedures*** for achieving a great performance of such products.

The recommendations hereby mentioned, are in compliance with the items of the ABNT-7037 standard, to which they apply.

Dry-type transformers for indoor installation: Consider items A, B, C, D, E, F, G, H and comments.

Dry-type transformers for outdoor installation
Consider items A, C, E, H and I.

B – General Considerations

Dry-type transformers for indoor installation are projected so that they are not affected by humidity when energized, as the heat produced by its own losses is enough to keep its insulation dry.

Transformers must be transported without wheels, being fully supported by the base.

C - Receiving

Whenever possible, the transformer must be unloaded directly on its permanent base. Before unloading it, a preliminary inspection must be performed by a specialized team on the transformer, thus verifying its external conditions, accessories and components, regarding any deformities and the condition of the paint. We must be immediately notified should any abnormalities arise.

All the unloading and transportation service of the transformer must be conducted by a *specialized crew*, in compliance to the *security* standards and making use of the appropriate points of support. The handling must be performed in a planned and cautious way, and any rough movements and sudden stops are to be avoided.



D - Storage

Whenever it is necessary to store the transformer, this must be conducted in a sheltered, dry and closed space.

- . Avoid direct contact with the ground
- . Avoid penetration of humidity
- . Avoid opening of entrance of dust
- . Avoid corrosive gases nearby
- . Keep the temperature uniform (heated if possible).

The condensation of humidity must be prevented or considerably reduced with the insertion of electric heating resistors (small heaters) around the transformer.

E - Installation

The transformer must be installed on an appropriate, level and resistant foundation. When the transformer has wheels, rails should be considered for the foundation. For moving, use the hooks or lugs for suspension / dragging that are meant for this purpose, being especially cautious not to touch the edges and flanges of the transformer.

F - Maintenance

- . Every 12 months in clean and dry environments.
- . Every 3 months in polluted environments (dust)

With the transformer *de-energized*, it's possible to open the protection case and check it, carefully following the instructions below:

- . Check the condition of the paint (remove the occasional points of oxidation, by stripping and applying the paint).
- . Remove the accumulations of dust, preferably with a vacuum or dry compressed air or even dry nitrogen gas.
- . When using compressed air or nitrogen gas, it must be dry and clean, apply relatively low pressure (approx. 2 atmospheres).
- . The panel supports, the terminals, insulators and the entire insulating surface, must be cleaned with dry and clean cloths.
- . Never use water, solvent or detergents, because they damage the insulation.



G - Precautions

Never open the protection case with the transformer energized

Avoid:

- a)** – Installations with leaks;
- b)** – Installations with water infiltration;
- c)** – Installations with the possibility of flooding;
- d)** – Polluted installations (refer to atmosphere).

Provide:

- a)** appropriate protection regarding the accidental entrance of water through open windows;
- b)** appropriate protection regarding the condensation of humidity in water or steam piping;
- c)** appropriate protection regarding the use of water in the surrounding areas;
- d)** appropriate protection regarding the deposition of impurities (dust);
- e)** appropriate ventilation for proper cooling (refer to cooling);
- f)** heating around the transformer, when it's disconnected.

H - Protection

Special attention should be given when choosing lightning rods and the *grounding* system. A thermometer or over temperature relay is advisable.

I – Outdoor installation

This item refers only to dry-type transformers for outdoor installation.

- . Avoid storage in direct contact with the ground;
- . Never open the case with the transformer *energized*;
- . Never leave the viewing covers open, to avoid the penetration of humidity
- . Conduct periodic cleaning of the case's external surface, because good heat dissipation depends on it;
- . Appropriate ventilation for proper cooling;
- . Avoid installation close to hot surfaces.



General Comments

1 - Cooling

For proper cooling of the transformer, it is essential to have proper ventilation. When installed in closed spaces, there should be enough ventilation so that the current air temperature doesn't exceed a maximum of 40°C and an average of 30°C.

The values planned for projects with maximum ratings are based on a daily average of 30°C.

The amount of air current must have the approximate value of 3 m per minute, per kW of losses from the transformer.

The effective area will have at least 1 m² per input and output opening, for each 100 kVA of transformer capacity, disregarding the area occupied for protection, grids or blinds.

A minimum of 50 cm distance must be kept between the transformer and walls that might obstruct the free circulation of air.

2 - Atmosphere

Dry-type transformers for indoor installation should not be used in atmospheres contaminated by coal dust or airborne metallic dust, as these impurities are deposited on the insulations, thus causing discharges and arcs, damaging it entirely.

Such accumulation must be extracted through a cleaning whose regularity will depend on environmental conditions.

Special attention should be paid in regards to the signs of *overheating* and *escape* routes in the insulating surfaces, which occur through carbonizations.

This type of transformer should not be installed in environments with unusual releases of *chemical gases* either

In polluted environments, the air being filtered reduces the maintenance services.