

CSP Power Transformers

GENERAL INFORMATION

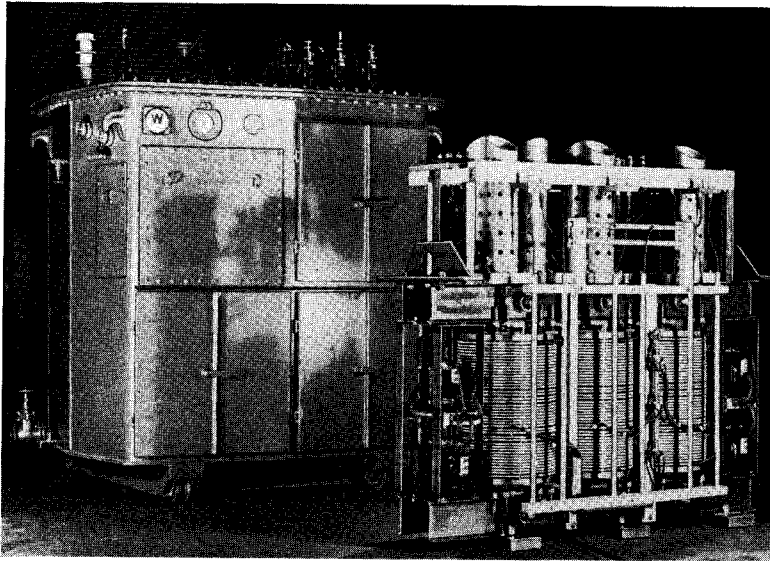


FIG. 1—TYPICAL CSP POWER TRANSFORMER

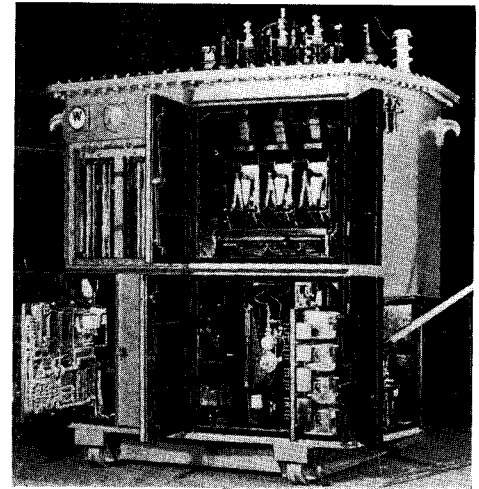


FIG. 2—CSP POWER TRANSFORMER, COVER REMOVED

GENERAL

The above Fig. 1 shows a completely assembled "CSP" power transformer and also shows the component parts of the assembly. The external view at the left shows the unit as it would appear when in service. At the right the transformer is shown with the inspection doors open and the control panels swung out. The tap changer is shown at the upper left and its control equipment directly below it, the air switch is shown on the upper right with its operating mechanism and control equipment directly below it, the lightning arresters are on the cover, and the inertaire equipment is in the center at the back of the air switch control compartment. The view of the core and coils is from the high voltage side and shows the protective link barriers supported at the top by the terminal board and setting on the core, the current transformers on the shelves at each end of the main transformer, and the no load tap changer mounted vertically between the second and third coil. The preventive auto-transformer, series transformer and auxiliary transformers are part of this assembly but in this view are not visible as they are hidden by the main transformer.

SHIPMENT

In general, the CSP power transformer is shipped completely assembled. All relays are blocked to prevent damage to the moving parts from shipping shocks. The inertaire equipment is assembled except that the pipes from the breathing regulator to the tank are disconnected and the ends plugged. When shipping clearances so demand, the lightning arresters and bushings are removed and shipped separately.

INSTALLATION

Because "CSP" power transformers are shipped completely assembled, the work of installation is reduced to a minimum. The following operations are necessary:

1. Examine the entire unit carefully for any damage resulting from shipment.
2. If bushings or lightning arresters were shipped separately, install them on the transformer.
3. Remove the plugs from the inertaire pipes if inertaire equipment is used and drain out any oil which may have slopped into the pipes during shipment. If the bushings

were shipped assembled on the cover, the transformer will have a positive pressure of inertaire so that when the plugs are removed to drain the oil, the gas will flow outward. Connect the tube from the breathing regulator as quickly as possible before the outward flow of gas stops so that air will not get into the tank. Then open the valves on the nitrogen tank and the valve on the breathing regulator. This puts the inertaire in service.

4. If the transformer was shipped with the bushings removed, the inertaire equipment should be connected as described above, but then instead of opening the valves, the gas space should be blown out as described in the inertaire section of this instruction book.
5. Install the glass cover over the tap changer position indicator, making sure that one maximum indicating hand is on each side of the position pointer.
6. Operate the tap changer, by the hand crank, over its entire range to make sure there is no binding.

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7. Operate the air switch by hand to see that it latches, closed, and trips freely.
8. Remove all blocking from the relays.
9. Operate the tap changer from the manual control switch. Also operate it by automatic control by manually closing the contacts of the primary relay.
10. Operate the air switch from the manual control switch. If a testing outfit is available for checking the current trip coils, trip the air switch from the test blocks by means of the test set and let it reclose from the reclosing relay.
11. Connect the lines to the bushings. If the transformer is being connected to a network, before closing the air switch, move the tap changer to the position where the transformer voltage equals the network voltage.
12. For detailed information on the individual parts, see the sections of this instruction book describing those parts.

MAINTENANCE

The "CSP" power transformer is designed to reduce maintenance to a minimum. It should be inspected periodically at least once a year and any defects should be corrected. The following points should be especially noted at the time of the inspection.

1. The "deion" chambers of the air switch should be removed and examined to make sure no copper particles are stuck in the grid stack.
2. The air switch contacts should be examined, and replaced if badly burned.
3. Drain the oil from the tap changer, remove the front inspection plate and examine the contacts. Replace any which are badly burned.
4. Tighten the brake in the tap changer operating mechanism so that the tap changer stops exactly centered on position.
5. Inspect the relay contacts and dress burned contacts with a fine file.
6. Put a drop of oil, Westinghouse S# 1101752, on the clutch shaft

between the faces of the clutch on the TK relays.

In addition to the above, the inertaire equipment should be inspected often to see that the nitrogen supply is maintained. A new cylinder should be installed whenever the pressure drops to 200 lbs. per square inch.

Details of the maintenance of the individual parts are described under the sections covering the parts.

RENEWAL PARTS

The renewal parts are described in detail under the sections covering the component parts of the "CSP" power transformer. It is recommended that a spare set of inspection plate gaskets be carried in stock for use at the time of the annual inspection. It is also recommended that a spare set of tap changer transfer switch contacts and a set of air switch contacts be stocked for use if necessary at the annual inspections.

Other renewal parts described in the individual sections may be carried if desired but are not normally required.

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