

## Air Blast Equipment and Auxiliaries INSTRUCTIONS

**GENERAL:** Westinghouse manufactures four types of radiator air blast equipment: the hood and bank type for radiators, the cooler tube and the portable type. The control equipment for all types is the same. An occasional greasing and inspection are required after the equipment has been installed. This is explained in detail under Operation and Maintenance.

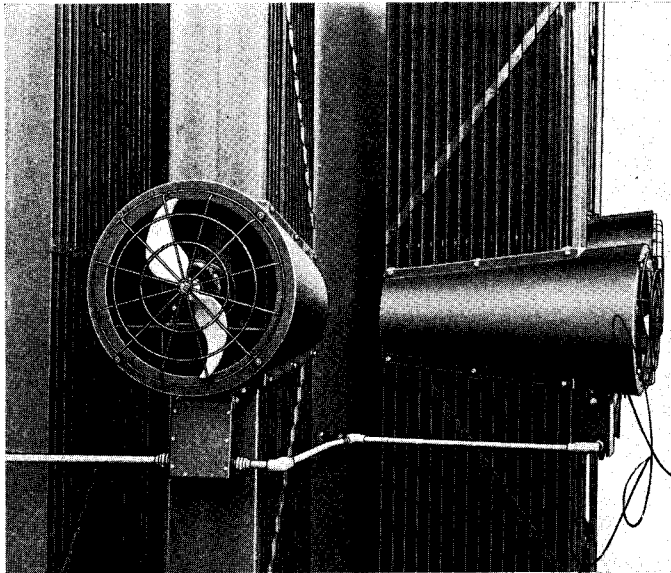


FIG. 1—HOOD TYPE RADIATOR AIR BLAST EQUIPMENT

### HOOD TYPE RADIATOR AIR BLAST EQUIPMENT

The hood type air blast equipment consists of a conical hood designed to fit over a portion of the Westinghouse radiator as shown in Fig. 1. The motor-driven fan is mounted in the outer end of each hood. The air stream from each hood is directed inward and upward through each radiator, thereby increasing the normal rate of heat dissipation.

### Bank Type Radiator Air Blast Equipment

The bank or multi-fan unit type air blast equipment consists of a number of fans mounted on the side of the first of a group of radiators. A schematic arrangement is shown by Figure 2.

The Westinghouse type radiator with its expanded cooling elements arranged in parallel rows provides a group of continuous ducts. The blast of air from the fans is directed through this duct system thereby greatly increasing the normal convection characteristics.

This type air blast equipment is applicable only to the Westinghouse radiator. The radiators must be mount-

ed in alignment in banks to provide the proper duct system.

### Tube Cooler Type Air Blast Equipment

The tube cooler type air blast equipment consists of unit fans that are mounted near the bottom of the tank and under the tubular cooling elements. The air stream is directed upward and slightly inward so that the natural convection of both the tubes and tank wall is increased.

Figure 3 shows the arrangement of this type auxiliary equipment.

### Portable Type Air Blast Equipment

The portable type air blast equipment consists of a complete fan and guard assembly mounted on a fabricated steel stand. The unit is designed for use as an auxiliary source of air blast

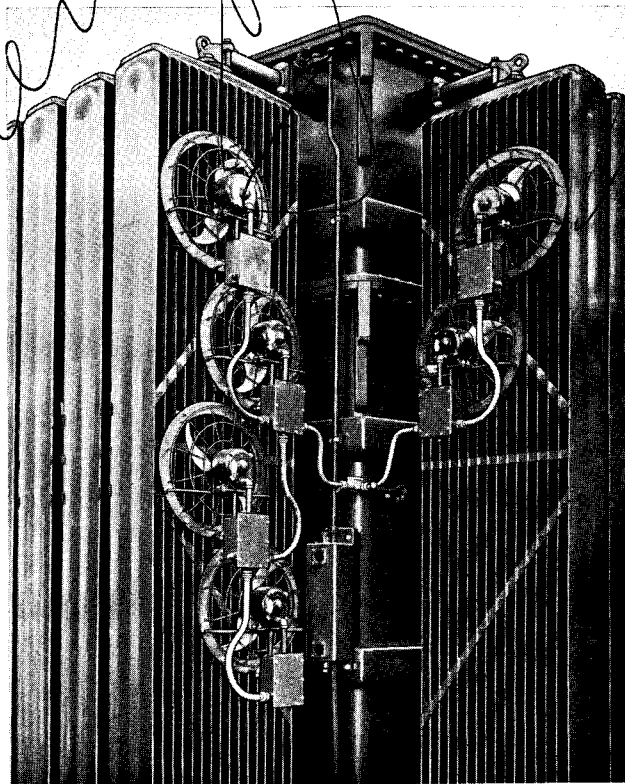


FIG. 2—BANK TYPE RADIATOR AIR BLAST EQUIPMENT

## Multi-Fan Unit Air Blast Equipment—Continued

### INSTRUCTIONS—Continued

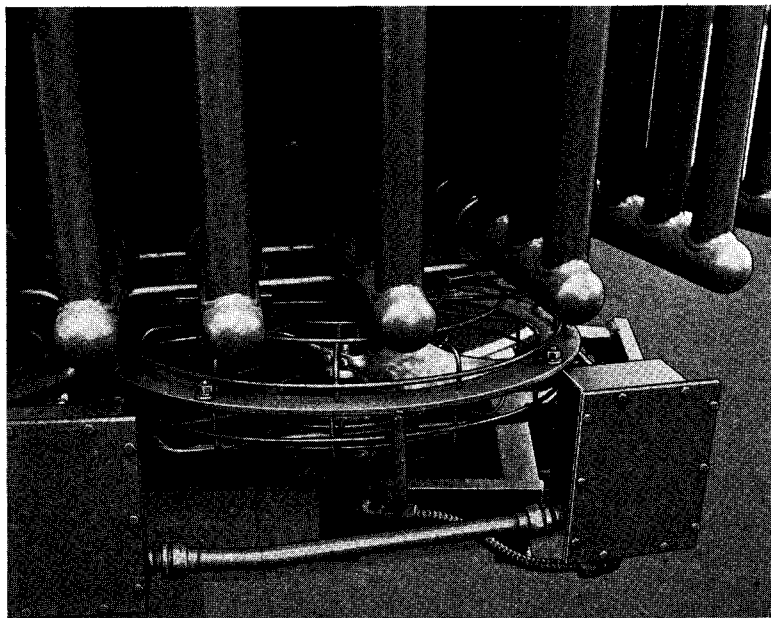


FIG. 3—TUBE COOLER TYPE AIR BLAST EQUIPMENT

equipment for miscellaneous types of apparatus. It may be used with effect for any type of radiator or cooling system that normally depends upon natural convection for heat dissipation.

The air stream may be directed at any angle from downward to upward by adjusting the fan mounting. Figure 4 shows this type of equipment.

The unit may be placed in service as a temporary or permanent installation for either indoor or outdoor use. Standard automatic or manual control is available for Westinghouse transformer application.

### INSTALLATION

It is usually necessary to remove radiators for shipment due to railroad clearance limitations. Before the radiators are assembled on the transformer, a careful study of the outline and the actual job should be made. The outline shows the proper height for the location of hoods and banked fans. Banked fans are usually shipped properly located and attached to one or more radiators, depending upon the number of banks.

Mount the radiators and cooling fans, the control cabinet, conduit and connections as shown on the outline drawing. Place the control thermostat bulb in the cover as shown in Figure 5.

The power connections to the panel are to be made as shown on the air blast

wiring diagram, a copy of which is included in the complete Transformer Instruction Book.

### Control Panel

The air blast control panel is located in a weatherproof cabinet which is attached to the tank wall.

There are two types of panels:

**Type A**—for small power, CSP and unit substation transformers where not over six single phase fans are operated from a panel, refer to Figure 6.

The apparatus on this panel consists of a de-ion type AB line breaker, the control thermostat which carries the motor current, flip-on switch and terminals.

**Type B**—for large power transformers where more than six single phase or where three phase fans are connected to a panel. Refer to Figure 7. The de-ion AB breaker, type DN contactor, control thermostat, flip-on switches and terminals are mounted on the panel.

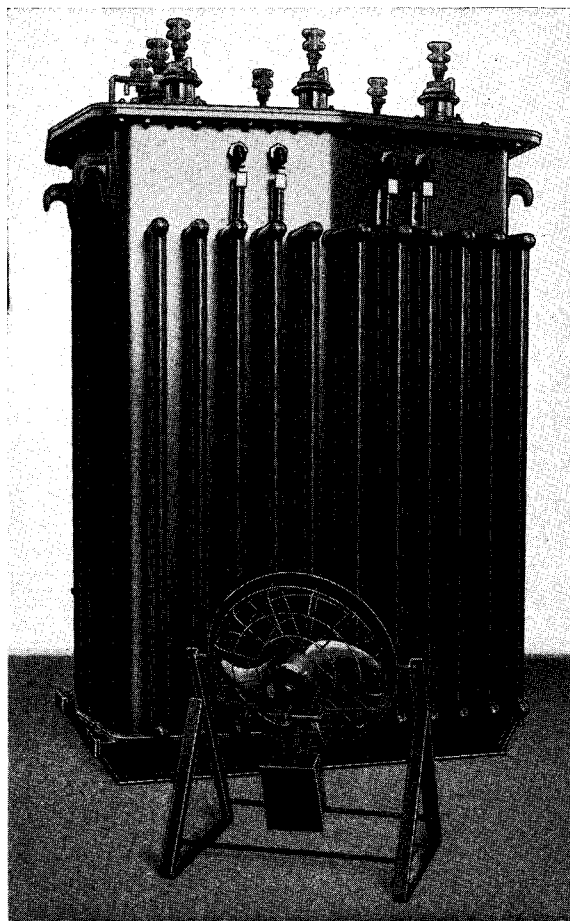


FIG. 4—PORTABLE TYPE AIR BLAST EQUIPMENT

## Multi-Fan Unit Air Blast Equipment—Continued

## INSTRUCTIONS—Continued

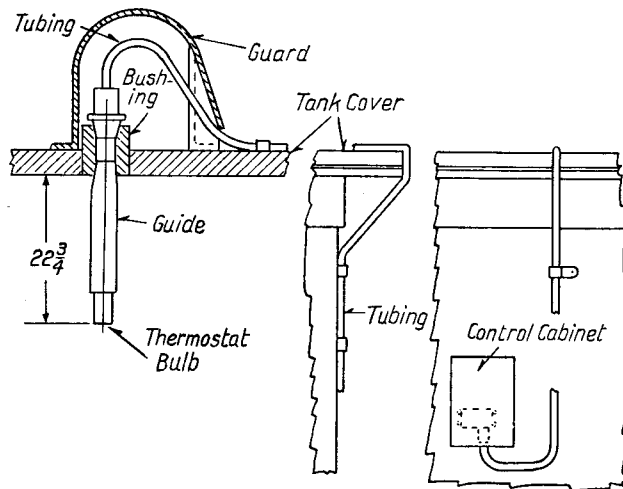


FIG. 5—THERMOSTAT CONTROL READY FOR OPERATION

**Function of the Parts**

The thermal trip AB breaker provides short circuit protection and a means of de-energizing the panel for inspection and fan maintenance.

The type DN contactor serves to interrupt the fan load. It is actuated by a magnetic solenoid connected to the thermostat control circuit.

The control circuit is composed of the solenoid coil, the thermostat contacts and manually operated flip-on switches. The circuit is energized from the load side of the panel power circuit. The manually operated flip-on switches provide a means of starting or stopping the fans independently of the position of the thermostat contacts.

There are independent auxiliary circuits for lamp or alarm indicator connections available at terminals on the panel.

**Control Thermostat****Hot Oil Type**

The bulb of the thermostat projects into the hot oil through a fitting on the transformer cover. The sealed tube between bulb and instrument is protected by flexible armor tubing.

Temperature changes at the bulb are transmitted as pressure changes to the instrument. The instrument mechanism is adjusted and calibrated to operate within a range of 50°C to 100°C. The unit is shipped with a range setting to close contacts at 60°C.

This setting may be changed to accommodate the requirements of the actual loading or seasonal conditions. The adjustment is made by a small knurled wheel at the right end of the thermostat housing.

A second adjustment provides variation of the differential between the temperature of closing and opening of the thermostat contacts. The spread of this differential may be varied between approximate limits of 3 to 25°C. The unit is set at 10°C differential before it leaves the factory. Field adjustments

may be made to meet particular operating conditions. The adjustment is changed by a knob on the upper left surface of the instrument. Turning the knob counter-clockwise increases the spread of the differential. Frequent starting and stopping of the fans indicates that the spread of differential has been set too low.

**Hottest Spot Type**

This type is the same as the Hot Oil Type, except that the thermostat bulb is imbedded in an auxiliary heating coil. Current proportional to the load on the power transformer is supplied to the heating coil from a current transformer. The heating coil and current transformer are designed to include compensation for duplicating the Hottest Spot winding temperature.

The gradient and temperature range settings of the thermostat may be varied slightly to match local conditions. The unit is shipped with the gradient and range set for 10 and 75 degrees Centigrade, respectively.

**Manual Control**

The equipment used for manual control is similar to that used for the automatic control except that the thermostat is not provided.

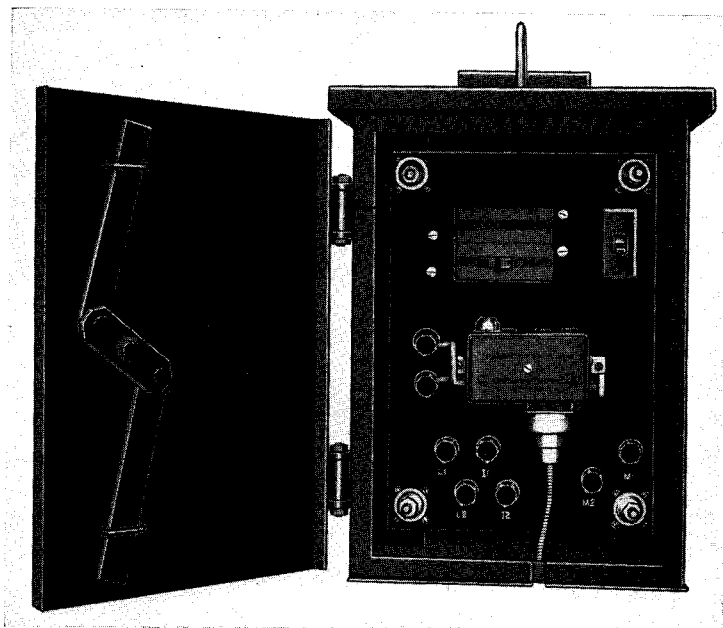


FIG. 6—TYPE A CONTROL PANEL

## Multi-Fan Unit Air Blast Equipment—Continued

## INSTRUCTIONS—Continued

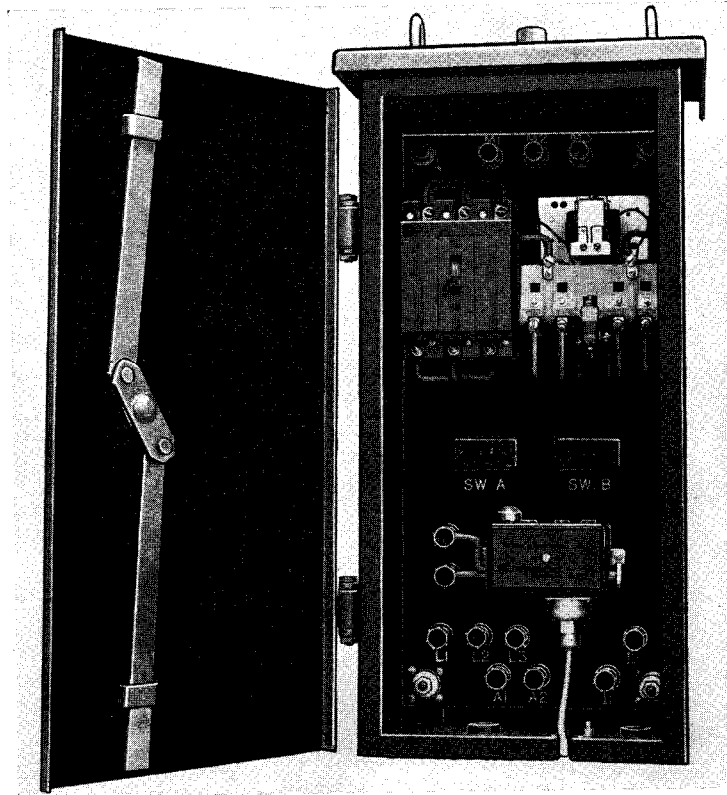


FIG. 7—TYPE B CONTROL PANEL

**GREASING**

The motors are of the ball bearing type. They are designed to operate for long periods of time without greasing. Over-greasing a ball bearing assembly is an invitation for trouble. It is recommended that the threaded plug at each bearing hub be removed at about two-year intervals. Fill the plug hole with grease, press in firmly with the thumb and replace the plug. A high

grade grease of the consistency of alomite lubricant should be used.

**PAINTING**

Good practice dictates that apparatus should be kept protected with paint. The entire air blast equipment, except the propeller, should be painted at regular intervals.

**INSPECTION**

A regular, thorough inspection should

be made of the equipment to insure the best service.

**RENEWAL PARTS**

If for any reason renewal parts are required, transmit the description of the particular part and the transformer serial number to the nearest District Office or Service Shop of the Westinghouse Electric Corporation or directly to the Corporation's Sharon Works, Sharon, Pa.

**Westinghouse Electric Corporation**  
Sharon, Pa.