DESCRIPTION • INSTALLATION • MAINTENANCE

# INSTRUCTIONS

## HIGH VOLTAGE CONTACTORS

### Types AH-31 and AH-32

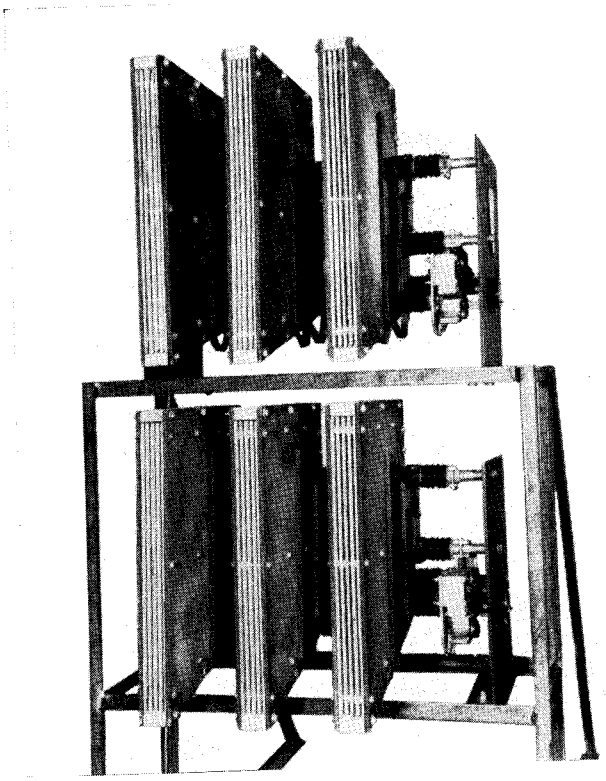

FIG. 1. Front View of a Type AH-31 Contactor with an A-C Operating Magnet

These devices are 3-pole, 200-ampere, 5000-volt a-c magnet contactors for motor starting service. Type AH-31 has an a-c operating magnet. Type AH-32 has a d-c magnet. Both are used with 2300, 4160 and 4600 volt motors. The number of turns in the magnetic blowout coils is selected according to Table No. 1 to obtain maximum effectiveness at all current ratings.

Fig. 1 shows the front view of a Type AH-31 Contactor with an a-c operating magnet. Both a-c and d-c operating coils have a continuous rating and are available for all standard voltages up to 600 volts. Two coils are used on d-c magnets. These should be connected in parallel, but opposite in polarity. (See Fig. 2).

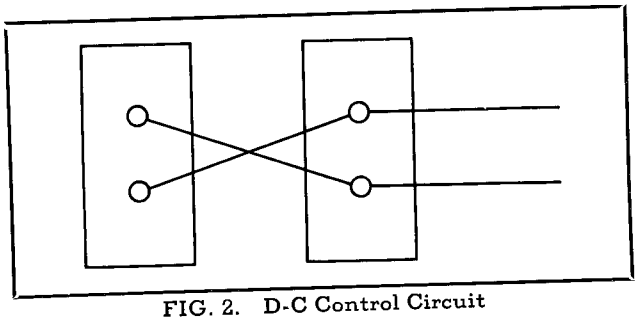

FIG. 2. D-C Control Circuit

An auxiliary switch panel having three single-pole, double-throw and one single-pole single-throw control circuit contacts is provided as illustrated in Fig. 3. These contacts are rated 5 amperes, 600 volts. Four circuits are electrically separated.

## INSTALLATION

Arc boxes are usually packed separately. Remove all packing material carefully. When lifting, fasten hooks in holes in the heavy steel end frames and use a spreader for the sling to avoid

**Table No. 1. TURNS FOR MAXIMUM HORSEPOWER**

| BLOWOUT COIL TURNS | 2200–2300 VOLTS | | | 4000–4600 VOLTS | | |
|---|---|---|---|---|---|---|
| | SYNCHRONOUS | | INDUCTION | SYNCHRONOUS | | INDUCTION |
| | 100% PF | 80% PF | | 100% PF | 80% PF | |
| 6 | 900 | 700 | 700 | 1500 | 1250 | 1250 |
| 12 | 450 | 350 | 350 | 750 | 625 | 625 |
| 15 | 250 | 200 | 200 | 400 | 350 | 350 |

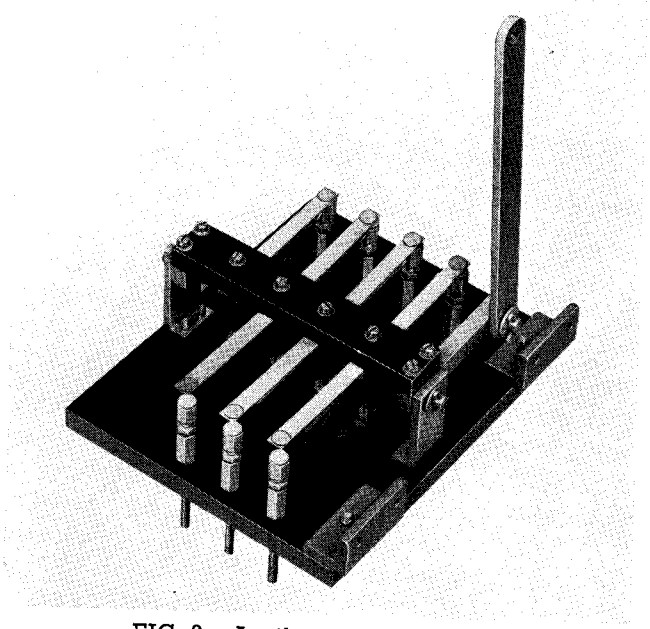

FIG. 3. Auxiliary Switch Panel

damage to contactor parts. Remove the material used to block parts from movement during shipment. Operate the contacts by hand to see that there is little friction and no interference.

When mechanical interlocks are used, be sure that it is not possible to close two sets of contacts at the same time.

**Mounting.** Although spherical self-aligning ball bearings are used, care should be taken to mount the contactor on flat level supports which will not distort the assembly and cause binding in the bearings. Leave space for installation and removal of arc boxes.

**Arc Boxes.** Install these as shown in Fig. 4 by hooking over the projection at the top of the stationary arc horn and rotating them downward until stopped by striking the ears on the casting just above the stationary contact. Always connect the flexible shunt between the arc box and moving contact.

Never operate the contactor while carrying current unless the arc boxes are in place. No uninsulated metal parts should be placed closer than 6 inches from either front, top, bottom or sides of the boxes. If the surface in front of the arc boxes is insulated, a spacing of not less than 3 inches may be used provided that the insulating material extends at least 6 inches above, below, and to the side of the arc boxes.

**Blowout Coils.** While these contactors have conventional magnetic blowout coils and large laminated steel pole pieces to distribute the magnetic field where most useful in extinguishing the arc, their blowout coils do not carry current except during arcing and, therefore, do not produce heat to raise contact temperatures and do not require ventilation when enclosed. The arrangement of contacts and blowout coil is illustrated by Fig. 5.

When the contacts are closed, no current flows through the blowout coil because the end of the coil connected to the stationary arc horn is insulated by a block of fiber between the horn and stationary contact. The arc formed, when contacts open, quickly bridges this insulated gap and transfers the path of the current to the blowout coil circuit where it produces a strong blowout field to move the arc outward along the horns and upward into the arc box.

**Barriers.** Attention is called to the two small barriers attached by means of screws to the lower arc horn assembly. One of these is shown in Fig. 5. The screws for attaching the other may also be seen. These lie inside the arc box alongside of the contacts and protect the surface of the box from severe burning and splattering of contact material.

There is a small amount of erosion of material each time an arc is drawn. This gradually produces holes completely through the barrier and permits the arc to attack the side walls of the arc box. The barriers should be replaced before this occurs.

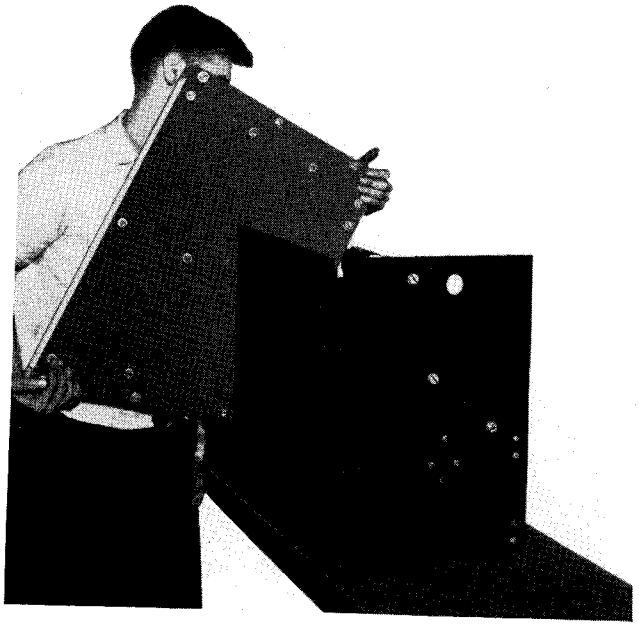

FIG. 4. Installation of Arc Chutes

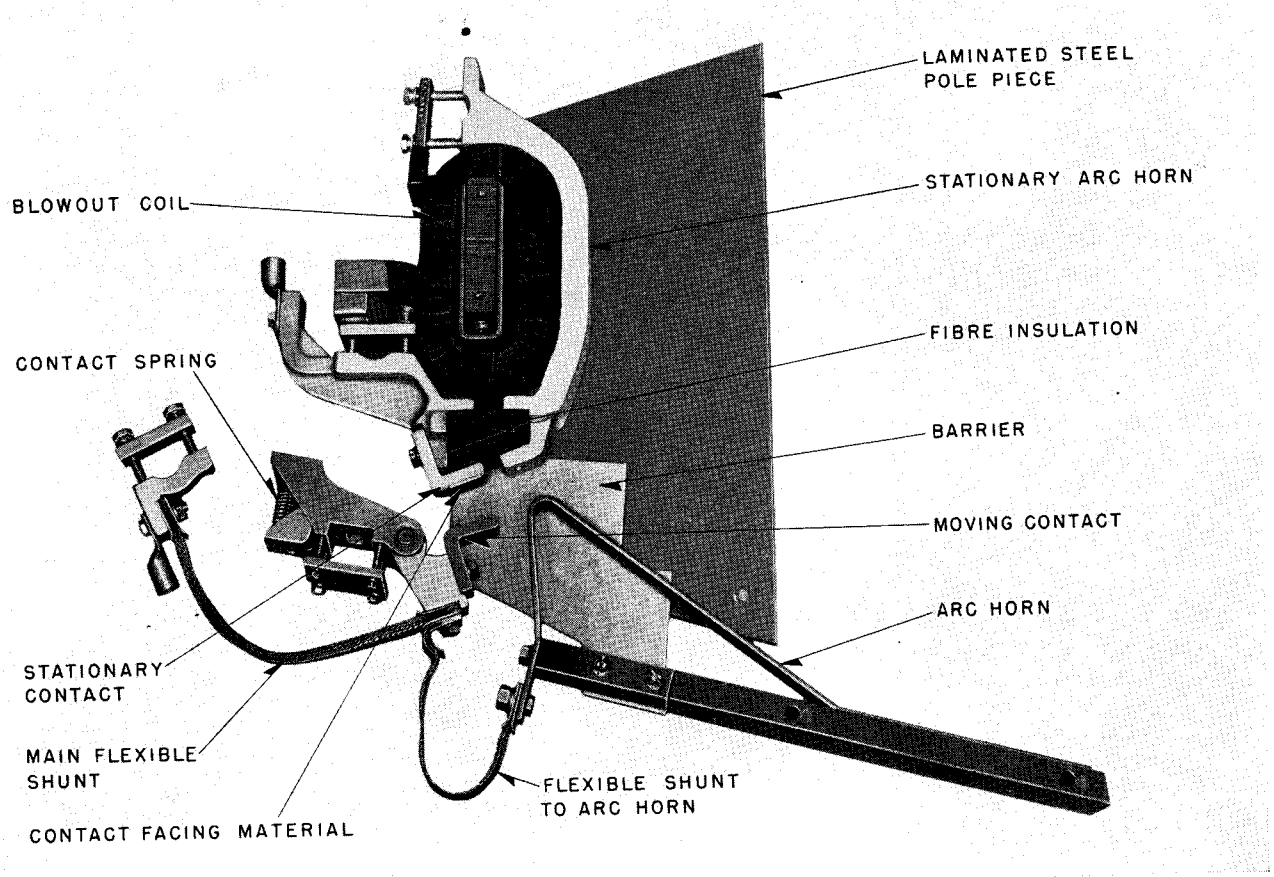


FIG. 5. Arrangement of Contacts and Blowout Coil

## MAINTENANCE

**Contacts.** Fig. 6 shows how to replace the contacts. This should be done when the special contact facing material has been burned away and the copper surface underneath is exposed. Contacts may be used until there is almost no additional contact spring compression when the contactor is closed. However, there is much greater possibility that contacts will weld, especially under fault conditions if used after the special facing material is burned away.

**Arc Boxes and Splitters.** After long use or as the result of opening heavy fault current, the inside surfaces of the arc boxes and arc splitters may become coated with a brown deposit or even with globules of contact material. When this appears serious enough to impair the insulating qualities of the boxes, they should be taken apart and cleaned off with a rough file.

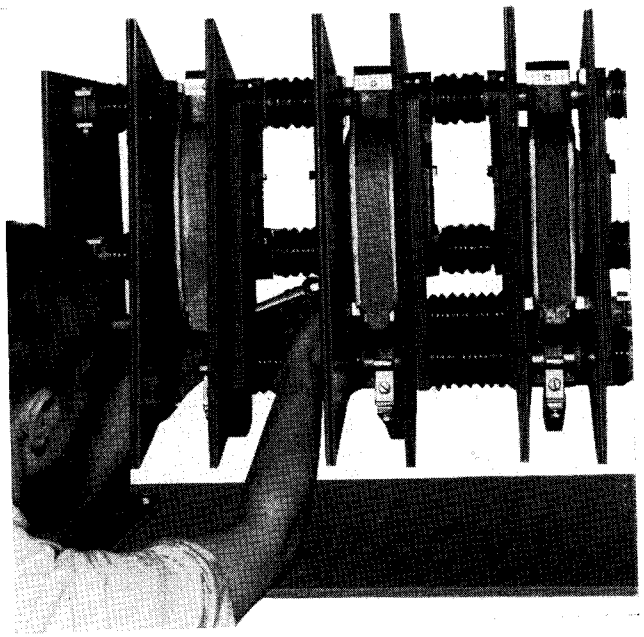

FIG. 6. Replacing Contacts

Do not paint the arc boxes with varnish or other insulating material when reassembling. See that fiber spacing collars are used to spread the splitters apart. Badly burned collars should be replaced with new ones or exchanged with less badly burned collars from the front of the boxes. If it becomes necessary to dry the arc boxes because of heavy moisture absorption, they may be baked at a temperature not to exceed 135°C. (240°F.).

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