



DESCRIPTION

INSTALLATION

MAINTENANCE

# INSTRUCTIONS

## Type NF—SIZE 5—A-C CONTACTORS 2-3-4-5 Pole Front or Rear Connected

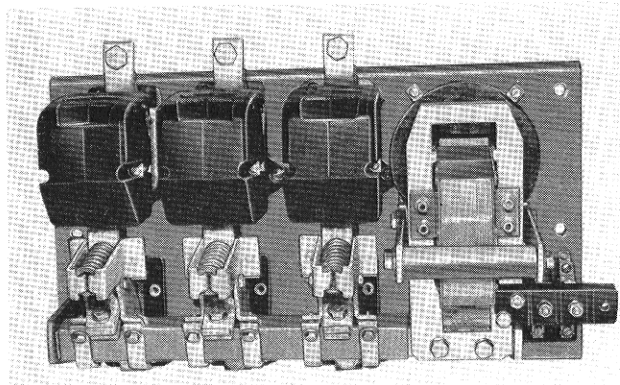


FIG. 1. Type NF-530 Front Connected Contactor

THE TYPE NF SIZE 5 CONTACTORS are unit assembled A-C contactors having all parts mounted on a steel base. The unit is suitable for mounting on either steel or insulating panels. Contactors are available in 2, 3, 4 or 5 pole, front or rear connected assemblies, with or without arc quenchers. All parts are front removable.

Table 1. Ratings

CHARACTERISTICS	OPEN	ENCLOSED
Voltage	600	600
8-Hour Rating, Amperes	300	270
1-Hour Rating, Amperes	400	360

The type NF Size 5 Contactors are insulated for a maximum of 600 volts. The operating coils are designed for continuous duty and will operate the contactors at 85% to 100% of their rated voltage.

### DESCRIPTION

The AC magnet is of a laminated "C" shape construction and mounted to the right of the contact arrangement. The moving armature engages the stationary magnet in a vertical plane parallel to the base plate and has a total travel from the opened to the sealed position of approximately 14 degrees.

The stationary magnet laminations are assembled into a precision die cast aluminum base. A permanent air gap is built into this structure to provide sufficient reluctance in the magnetic path to insure a positive drop out on de-energization. The air gap is so situated that the hammering resulting from operational impact will not decrease the amount of air gap. The operating coil surrounds the upper leg of the stationary magnet and is held in place by two bolts.

The moving armature is flexibly supported by a domed plate which makes it capable of self-alignment as it closes against the stationary magnet. An anti-bounce device straddling the armature and fastened to the stationary magnet absorbs the kinetic energy of the moving system on de-energization thereby minimizing armature bounce.

Needle bearing assemblies support the ends of the insulated shaft which mounts the moving armature and moving contact assembly. Stainless steel compression springs in the moving contact assembly supply final contact forces from 8½ to 10 lbs. with new contacts.

Each stationary contact assembly is mounted on an individual molded insulator. Conversion from front to rear connection or vice versa is easily accomplished by the addition or removal of a copper stud. The contacts, which are of copper, close with

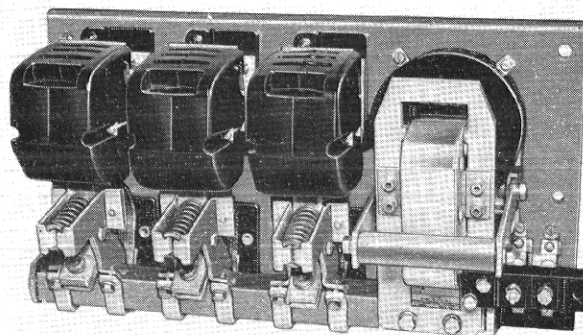


FIG. 2. Type NF-530 Rear Connected Contactor

## TYPE NF CONTACTORS

a rolling and wiping action which serves to keep the contacting surfaces clean.

The shunts are made from flexible braided copper cable. A projecting lip on the moving end lines up the shunt with the lower end of the moving contact. The fixed end of the shunt is secured to a molded insulator. Here, again conversion from front to rear connection or vice versa is accomplished readily by the addition or removal of a copper connecting stud.

**Electrical Interlocks.** The Type NF Size 5 Contactor will accommodate a total of three type L-60 electrical interlocks. Two such interlocks are shown mounted on the contactor pictured in Figure 1. The interlocks may be converted from normally-closed to normally-open circuit action or vice versa without adding parts. Instruction Leaflet I.L.-15829.

**Mechanical Interlocks.** The Type M-40 mechanical interlock is used when a pair of contactors must be mechanically protected against closing of one when the other is closed. Mechanical interlocking is possible on all pole arrangements and only when one contactor is mounted below another.

The mechanical interlock consists of a bearing bracket, operating arms and lever. An adjustment screw and locknut is provided at each end of the lever. The following procedure should be followed when adjustments are made. With the upper contactor in the fully closed position, and the lower adjusting screw resting on the lower contactor operating arm, adjust the upper adjusting screw until there is  $\frac{1}{64}$  inch clearance between it and the upper operating arm. Next, tighten the locknut. Check adjustment by opening the upper contactor and fully closing the lower contactor. The clearance specified above should prevail. Lock the adjusting screw in position by tightening locknut.

### INSTALLATION AND MAINTENANCE

**Arc Quenchers.** The arc quenchers and their hanger plates should be in place at all times that the contactor is required to interrupt a circuit.

The arc quencher is held in place by two fillister head machine screws and special washers located in recesses on each side of the arc quencher. To avoid mis-alignment stresses, the back side of the arc quencher must seat intimately against the face of the arc quencher hanger plate, before and after being fastened in place. Mis-alignment stresses could result in the fracture of the arc quencher due to the vibration encountered during contactor operation.

When replacing an arc quencher care must be taken to be sure that the special washers are placed correctly in the grooves in order to utilize the maximum groove bearing surface.

**Armature Assembly.** A periodic check of the armature assembly must be made to assure that the armature has the desired degree of freedom. It is essential that the two leaf springs are always in place between the bottom front of the bearing plate and the inside leg of the armature.

The socket head screws fastening the armature bearing plate to the armature support must be tightened at all times. The insulating plates and sleeves which are a part of this assembly must always be in place.

**Operating Coil.** Check the identification label when installing a new operating coil so that the voltage rating, frequency and coil style numbers are correct for the application.

Coils for Types NF-520 and NF-530 have been designed to operate within the temperature limits specified for NEMA Class A insulation.

Coils for the Types NF-540 and NF-550 contactors have been designed to operate at higher temperatures and are insulated to meet such service. The operator should not be alarmed to find the coils hot to the touch.

Table 2 gives a listing of the more commonly used coils.

**Table 2. Operating Coils**

COIL VOLTS	FREQ. CYCLES	NF-520 (2 Pole) NF-530 (3 Pole)	NF-540 (4 Pole) NF-550 (5 Pole)
		Style Number	Style Number
220	60	1617 648	1625 681
440	60	1617 649	1625 682
550	60	1617 650	1625 683
600	60	1617 651	1625 684
220	50	1617 652	1625 685
380	50	1617 653	1625 686
440	50	1617 654	1625 687
550	50	1617 655	1625 688
220	25	1617 654	1625 687
440	25	1617 656	1625 689
550	25	1617 657	1625 690

The following procedure should be used in removing and replacing the operating coil:

1. Remove all arc quenchers.

2. Remove armature stop bracket by removing the bolts securing the assembly to each side of the stationary magnet base. This will permit the armature and moving contact assemblies to be rotated out of the way to facilitate coil removal.

3. Drop the coil leads and slide the coil forward until it is free of the stationary magnet.

To mount the new coil reverse the procedure.

### CONTACTS

**Contact Forces.** Contact forces with new contacts should be as follows:

Initial Force—4.5 to 6.5 lbs.

Final Force—8.5 to 10.5 lbs.

Measure the contact force from a line  $1\frac{5}{16}$  inch below the moving contact tip and in a line perpendicular to the center of the stationary contact face.

Initial contact force is measured with the contacts in the open position. The force reading should be taken at the instant contact overtravel begins, that is when the contact leaves the contact stop.

Contact replacement is necessary when the overtravel has been reduced to  $\frac{5}{32}$  inch. This is represented by a gap of  $\frac{1}{16}$  inch measured at point "X", Figure 3.

Contact removal is achieved by the following procedure:

1. Remove arc quenchers.
2. Remove shunt bolt from moving contact.
3. Remove armature stop bracket.
4. Remove the knife edge bearing by taking out the two bolts securing it.
5. Remove moving contact.
6. Remove stationary contact.

To install new contacts, reverse the procedure outlined above.

**Contact Adjustment.** Make sure that the contacts touch simultaneously. Sufficient adjustment can generally be obtained by a selective tightening of the two bolts securing the shaft clamp to the moving contact bracket (Fig. 3), tightening one more than the other to produce a slight rotation of the assembly on shaft.

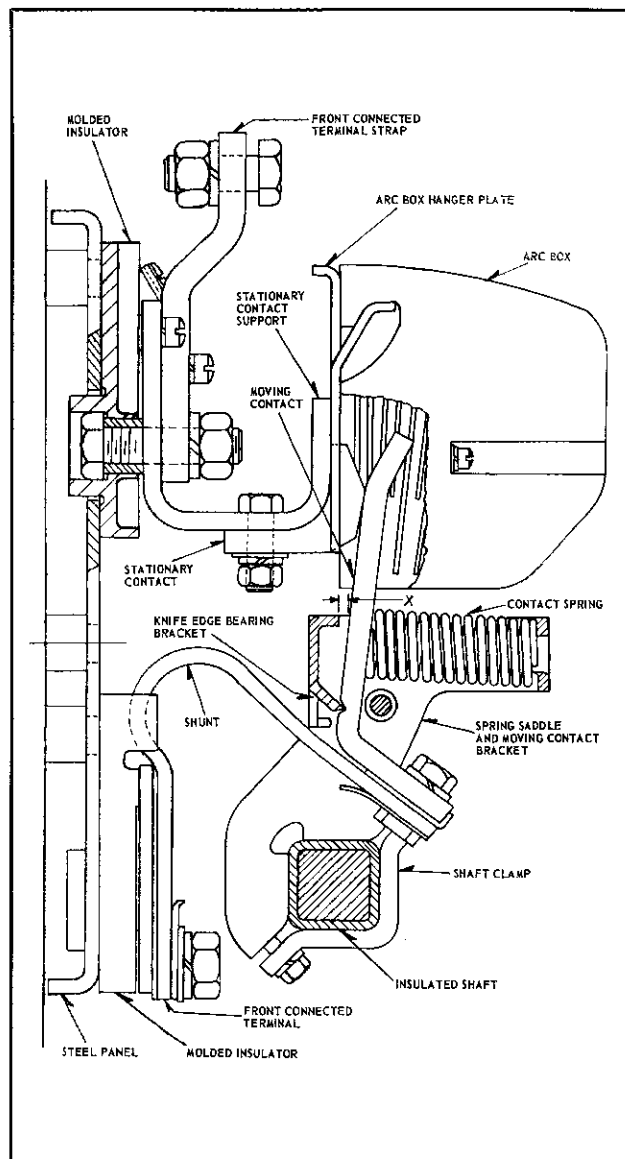


FIG. 3. Overtravel Measurement

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