DESCRIPTION INSTALLATION MAINTENANCE INSTRUCTIONS

SPECIAL MAGNETIC CONTACTORS, TYPE MMD

FRAME 320 DIRECT CURRENT TWO POLES MAGNET CLOSED

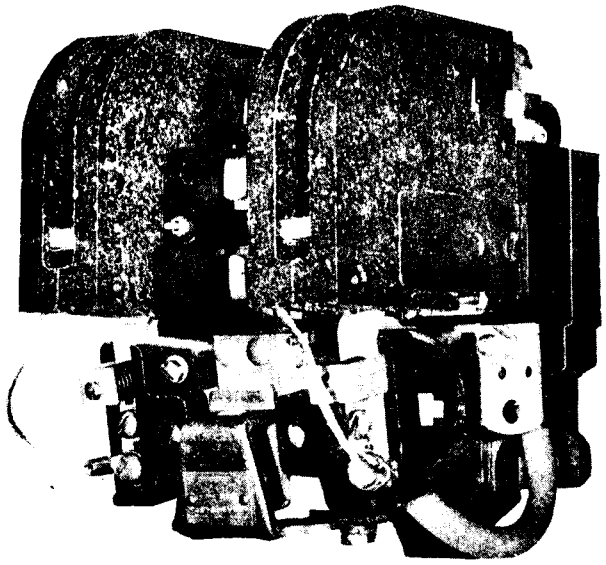

FIG.1 Type MMD-320 Front Connected Contactor.

TYPE MMD CONTACTORS are general purpose magnetically-operated contactors suitable for motor starting and switching applications.

RATING

TYPE	8 HR.	1 HR.	INTERRUPTING CAPACITY AT 600 V.
MMD-320	100A	133A	1000A

The operating coils are rated for continuous duty and will operate the contactors at 80 to 110 percent of their rated voltage.

The contactors are insulated for a maximum potential difference of 600 volts among parts.

DESCRIPTION

The contactors are of unit construction with all parts assembled on a common insulating base. The armature hinges on a knife-edge bearing which has an extremely long life and requires little maintenance.

A strong kickout spring minimizes the risk of accidental closing of the contactor under conditions of shock or tilt.

The contactor is supplied with Rostone "RCD" arc shields held in place by the customers blowout pole pieces and a spring clip, and may be removed by pulling them directly forward. An arc horn in each arc shield relieves the moving contact of excessive burning. The arc, which is drawn between the contacts when the contactor opens, moves outward under the influence of the magnetic blowout field and transfers from the moving contact to the arc horn. A flexible connection which is provided to maintain the arc horn at the same potential as the moving contact, serves also to prevent loss or misplacement of the arc shield when the latter is removed for inspection of the contacts.

The moving and stationary contacts are faced with solid silver. The moving contact is hinged on the armature in such a way that sliding or rubbing of the sur-

faces when the contacts meet is practically non existent, a provision essential to the long life of silver contacts.

A plate of non magnetic steel is secured to the underside of the armature to prevent the armature from sticking closed due to residual magnetism following the interruption of voltage to the operating coil.

Front connected contactors are held to the panel by two mounting bolts.

The contactors are suitable for mounting on any surface which will support it firmly. No additional special insulation is required.

ELECTRICAL INTERLOCKS. The contactor will accommodate a total of two type L-46 or L-66 electrical interlocks, which may be selected in any combination which does not exceed the maximum allowable quantities listed in Table No.1.

The type L-46 electrical interlock is obtainable as a normally-open or a normally-closed interlock. For more complete information refer to Instruction Leaflet 15-829-1B.

TABLE NO.1

ELECTRICAL INTERLOCK APPLICATIONS

ELECTRICAL INTERLOCK TYPE	MAXIMUM ALLOWABLE NUMBER OF INTERLOCKS TO BE APPLIED TO A CONTACTOR
L-46 Normally Open L-46 Normally Closed L-66 Normally Closed (delayed break)	2 2 2
Total number of interlocks of all the above types that can be applied to one contactor.	2

The type L-66 electrical interlock is a normally-closed, delayed-break interlock. It differs from the type L-46 normally-closed interlock in that its contacts separate late rather than early in the closing cycle of the magnet, and it should be applied only where such a delayed-break action is required. For all ordinary applications, the type L-46 interlock should be used. For more complete information refer to Instruction Leaflet 15-829-L-47-1A.

The stationary contact assembly of either type of interlock is mounted on the molded base of the contactor, occupying a space between the arc shields. The moving arm of the interlock is secured to the contactor armature by means of a single screw. Care should be taken when installing an interlock to make certain that its moving parts function freely and that the contact gaps and overtravels conform to the information given in its instruction leaflet.

The sequence in which the various switching operations occur as the contactor magnet closes is as follows: (1) the type L-46 normally-closed interlock opens; (2) the main contacts close, (3) the type L-46 normally-open interlock closes, and (4) the type L-47 normally-closed interlock opens.

A single contactor can accomodate only two of the three varities of interlocks at one time.

MECHANICAL INTERLOCK. A type M-25 mechanical interlock, Style No.494A503G03, may be employed to safeguard a pair of

contactors against the closing of one if the other is already closed. The contactors are mounted side-by-side on 6¼ inch centers.

INSTALLATION AND MAINTENANCE

ARC SHIELDS. The arc shields and their arc horns are essential to the performance of the contactor and these should always be in place. The flexible connections leading from the arc horns should always be securely fastened to the moving contacts. The arc shields may be removed by pulling them directly forward, allowing the magnetic blowout pole pieces (which act as their fixed supports) to guide them in their sliding movement. In replacing the arc shields, care must be taken that the guiding recesses in their sides locate themselves properly on and be gripped firmly by the supporting guides. If a pair of guides are found to be spread apart so that they no longer grip the arc box firmly, remove the arc box and spring the guides together by squeezing them with the fingers. The arc shields should be pushed back as far as they will go, until they are held securely against the molded base by the spring clip.

ARMATURE AND BEARING. The knife-edge bearing requires no maintenance other than the removal of accumulated dirt. Oil should not be used as it hastens the collection of dust.

The magnet pole face is secured to the core by means of a bolt having a head that projects forward into a hole in the armature. Care should be taken that the parts maintain proper alignment, and particularly that the bolt head be accurately centered in the armature hole. Dirt should not be allowed to accumulate.

OPERATING COIL. When a new operating coil is installed, the identification label should be examined to make certain that the voltage rating and the coil style number are correct for the application. The more commonly used coils are listed in Table No.2.

This contactor has Class H coils which operate at a temperature rise of 150 degrees C. The surface temperature of the latter coils will be higher than that of Class A coils.

The steps to be followed in removing the operating coil are:

1. Remove the arc shields by sliding them forward.

2. Loosen the two bolts securing the armature stop to the underside of the contactor frame until the armature stop can be lowered clear of the two dowel pins which locate it in position.

TABLE NO.2. OPERATING COILS

COIL VOLTS	TYPES MM-320,420 CONTACTOR COILS COIL STYLE NO.
115	1419 640
230	1419 641
550	1622 924

3. Allow the self-contained assembly comprising the armature, armature stop, moving contacts and springs to hang by the shunt.

4. Remove the bolt holding the pole face to the core of the magnet.

Printed in USA

5. Disconnect the coil leads and slide the coil forward until it is clear of the contactor.

CONTACTS. Oil or other lubricant should not be used on the silver contacts. The discoloration which results from arcing and from exposure to the atmosphere usually is not harmful to their performance, and consequently no filing or dressing is necessary.

When the contacts are new they should meet sufficiently in advance of the final sealing of the armature against the magnet pole face that a gap of approximately 5/32 inch appears between the underside of each moving contact and the upper edge of its insulating support, as indicated in Fig.2. As the contacts wear, the amount of this overtravel diminishes, and when at length it decreases to 1/32 inch, the contacts should be replaced.

A moving contact can be removed for replacement by first disconnecting its arc horn connection and its main shunt and then removing its contact spring. Each of the stationary contacts is slotted to facilitate removal, and it is necessary only to loosen the screw until the dowel projecting from the back of the contact is free of the locating hole in the stationary arc horn which serves as the contact support.

The contact gap when the contacts are new should be 9/32 to 11/32 inch, as shown in Fig.2.

If, after new contacts are installed, it is found that the overtravel and contact gap do not conform to the dimensions given: first, bend the moving contact straps to secure the proper overtravel: then measure the contact gap and, if necessary, bend the armature stop to secure the proper gap.

The contact pressures when the contacts are new should be as indicated in Table No.3.

To measure the final contact pressure, close the contactor mechanically and by means of a spring scale hooked to a loop of fine wire measure the force necessary to separate the contacts.

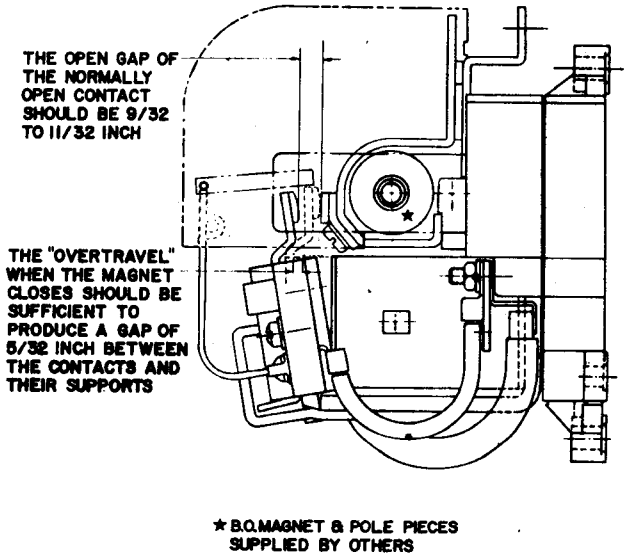

FIG.2. Sectional View of Types MMD-320 Contactors with Armature in Closed Position.

If, after new contacts are installed, the pressures are not correct, it may be necessary to replace the contact spring or to adjust the contact overtravel in the manner described previously.

Failure of the magnet to close the contactor may result from an open-circuited operating coil, from a circuit

Printed in USA

condition in which the voltage is excessively low or from the presence of friction between the parts. Failure of the contactor to open may be cause by friction or by defective kickout springs.

RENEWAL PARTS. Renewal parts may be ordered from the nearest Westinghouse Sales Office. Be sure to describe the part or parts required and give complete nameplate reading on the contactor for positive identification.

TABLE NO.3. CONTACT PRESSURES

CONTACTOR TYPE	CONTACT PRESSURE IN OUNCES	
	INITIAL	FINAL
MMD-320	9-12	22-26

Printed in USA