A-C MAGNETIC CONTACTORS

TYPE F—SIZE 5

SECTION NO. 6108
I.L. 6100-62F5/65F5-1

FRAMES 62-F-5 (2 Poles) and 65-F-5 (3 Poles) • (300 Amps.) • NORMALLY OPEN

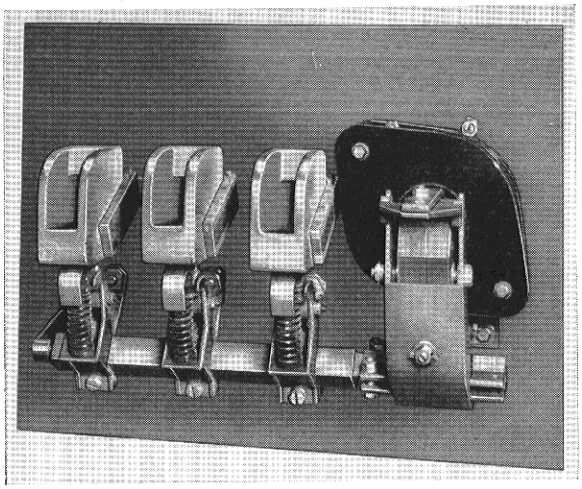

Fig. 1—Type 65-F-5 Three Pole A-c Contactor with Blow-out Coils and Arc Shield Assemblies

APPLICATION

The Types 62-F-5 and 65-F-5 Contactors are a-c magnetically operated contactors suitable for reduced or full voltage a-c motor starting and switching applications. These contactors are recommended for application to Marine Service controllers and starters.

RATING

These contactors have ampere and maximum hp ratings as tabulated in Fig. 2.

SIZE	8-HOUR OPEN RATING OF CONTACTOR AMPERES	MAXIMUM HORSEPOWER	
		220 VOLTS THREE PHASE	440 VOLTS THREE PHASE
5	300	100	200

Fig. 2—Rating Table

The operating coils are suitable for continuous duty at the rated voltage. A coil and magnet will operate the contactor satisfactorily from 85% to 110% of the rated voltage at rated frequency. These contactors are insulated for a maximum of 600 volts.

CONSTRUCTION

The Type 62-F-5 Contactor has two poles and the Type 65-F-5 Contactor has three poles. All poles are normally open and can be supplied with blow-out coil and arc shield assemblies when necessary.

These contactors are operated by means of a clapper type a-c magnet. They are for mounting on insulating panels up to two inches thick.

The armature lever is made of high grade cast metal. The floating armature is supported on the armature lever by means of a hinge pin. This arrangement permits the floating armature to be self aligning when the operating coil is energized and the contactor is closed.

The arc shields are moulded from a very durable heat resisting compound and are securely fastened to the iron pole pieces of the blow-out coil. The arc shield is hinged so that it may be easily raised by hand for inspection and renewal of the contact tips.

Fig. 3 shows the blow-out coil and contact assemblies after the arc shield has been swung out of the operating position.

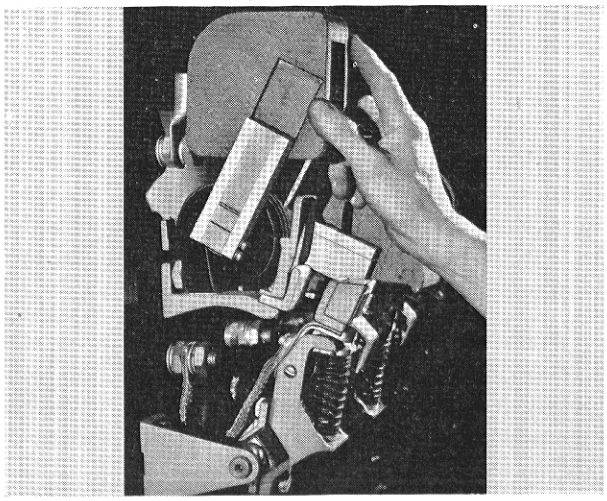

Fig. 3—View of a Type 62-F-5 Contactor with the Arc Shield Partially Removed

The contacts are made from hard drawn copper and the contact surfaces are inlaid with silver alloy.

The shunts are made from flexible braided copper cable. The moving end is directly connected to the moving contact. This assures good conductivity at a point which otherwise is subject to loosening and overheating. In case of replacement, both the shunt and moving contact must be replaced at the same time.

OPERATION

When an a-c voltage that is within the operating limits is applied to the magnet coil, the moving armature will be attracted toward the stationary part of the magnet. The moving contacts will touch the stationary contacts before the armature is fully sealed and will complete a circuit from the top connection stud through the blow-out coil, the stationary contact, the moving contact, and the shunt to the lower connection stud. The contact overtravel which is produced by the additional armature travel from the contact touch position to the armature fully sealed position assures adequate contact pressure as the contacts wear.

When the armature is in the fully open position, the operating coil current for this particular magnet is approximately six times the current that the coil draws when the armature is in the fully sealed position. The coil impedance increases as the armature closes. The magnet should be inspected periodically to make certain that the armature fully seals or the coil winding may overheat.

When the contactor is required to interrupt a circuit, the contact poles should be equipped with blow-out coils and arc shields. The load current flowing through the blow-out coils will create a magnetic field in the region of the contacts which will assist in interrupting the arc when the contacts are opened.

When the operating coil is de-energized, the force produced by the contact springs and the weight of the armature will quickly open the armature and contacts to interrupt the circuit.

INSTALLATION—MAINTENANCE—REPLACEMENT OF PARTS

1. **GENERAL**—General instructions and suggestions for installation and maintenance can be found in Instruction Leaflet 6100-1. All current carrying connections should be kept as clean and tight as possible.

2. **CLEANING**—It is not advisable to clean the contactor with an oily rag or waste. A film of oil will collect particles, which will decrease the creepage insulation and may cause an arc between adjacent parts of opposite polarity.

3. **ARC SHIELD**—The arc shield should always be down so that the arc is broken within the field of the blow-out coil; otherwise, the shield will not give satisfactory results.

4. **OPERATING COIL**—The coil may be removed by taking out the main shaft which allows the armature to be lowered, disconnecting the terminal leads, and removing the screws which hold the coil in place.

5. **CONTACTS—SPRING PRESSURE**—Oil or other lubricants should not be used on the contacts. The contacts normally wear to give the best contact surfaces without any attention. The roughened appearance of the contacts is no indication that good contact is not being obtained. The contacts should be replaced when the maximum safe use has been reached in order that the contact pressure will not fall below the safe minimum value. The contact pressure for these contacts, measured at the heel of the contacts, should be between 11 and 12 pounds. To measure the final contact pressure, close the contactor mechanically, place a thin piece of paper between the contacts, then measure the pounds pull necessary to separate the contacts by means of a hook spring balance attached to the head of the screw which holds the moving contact in place. Read the pounds pull required at the instant the paper can be moved. In case the contact pressure is below the minimum value, after the contacts have been replaced, additional insulating washers should be added under the spring. Low spring pressure should be guarded against to avoid excessive heating of the contacts. Excessive heating increases the contact resistance which may cause arcing at or welding of the contacts together.

6. **NOISY MAGNET OPERATION**—A-c magnets normally produce a low magnetic hum. If the contactor becomes excessively noisy, an immediate examination may prevent serious damage. The armature should be first checked for proper sealing. Any obstruction between the armature and stationary part of the magnet may prevent the armature from properly sealing; this condition would cause the magnet to chatter and may in time overheat the operating coil. The armature lever may become distorted through rough use, which will not allow the floating armature to seat squarely. Check this by placing a sheet of paper between the two pole faces and closing the contactor magnetically.

This will leave an impression of the high points. Full contact is not actually necessary, but should be over a large portion of the pole face surfaces.

The coil voltage should be checked to make certain that it is within the limits of the rated value. A broken shading coil will also cause chattering. The contact pressure should be checked to make certain that it is not too high, as an excessive pressure would prevent the armature from being held in the sealed position.

7. CONTACT GAP—The contact gap is the distance between the stationary and moving contacts when the moving contact is in the fully open position. The gap, measured at the heel of the contacts, should be approximately ¾ inch when the armature is in the fully open position and the contacts are new. If the contact gap is excessive, the armature may not pick up on the minimum voltage for which the operating coil has been designed.

8. FAILURE TO OPERATE—Failure of the armature to close may be caused by the coil circuit being open, power failure or low voltage, or mechanical interference. Failure of the armature to open may be caused by the coil circuit being closed, mechanical interference, or broken contact springs.

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