



INSTRUCTIONS

MOTOR OPERATED MECHANISM FOR AB DE-ION® CIRCUIT BREAKER TYPE KL 2 and 3 Pole 400 Frame Size

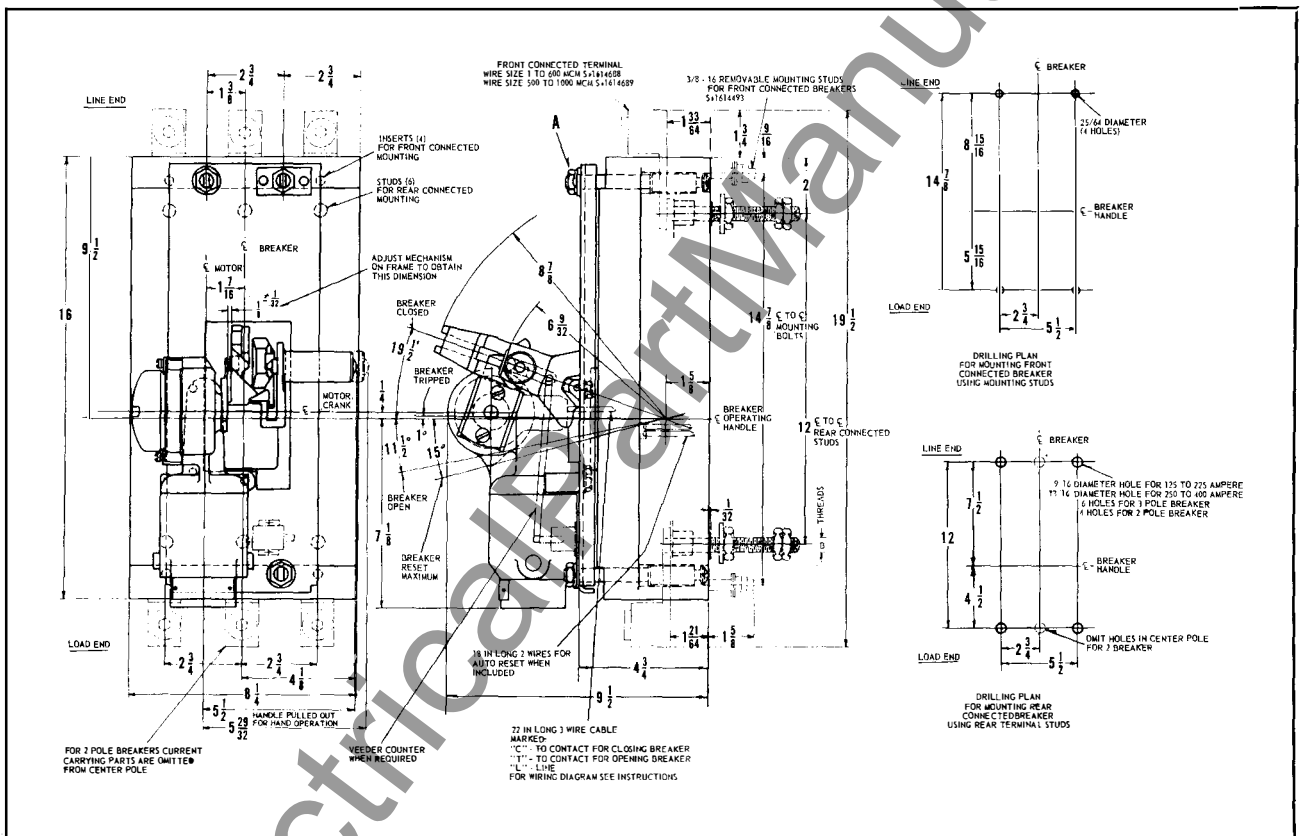


FIG. 1. Outline Drawing of Motor Operated Mechanism Mounted on Two- and Three-Pole Breaker.

THE MOTOR OPERATED MECHANISM is intended to electrically operate the breaker to either open, close, or reset positions. It is controlled by contact making devices outside the breaker and motor mechanism, and performs its function by means of a motor moving the breaker handle with the aid of a system of worm gear, crank, operating rod, and handle attachment.

The motor operated mechanism consists of a motor, single speed reduction means, a crank, a limit switch, a centrifugal brake, a housing for mounting the parts just mentioned, an operating arm, a breaker handle attachment, and an emer-

gency handle. The speed reduction is made between the motor and the crank by a hardened steel worm coupled directly to the motor shaft and a bronze worm gear coupled to the crank shaft. The motor, gear and worm have packed ball bearings containing sufficient lubricant to last throughout the life of the apparatus. The operating rod is the mechanical link between the crank and the handle attachment. The handle attachment is fastened to the breaker handle and has a clutch which either connects the operating rod mechanically to the breaker handle, or disconnects the operating rod when the emergency handle is pulled out.

MOTOR OPERATED MECHANISM

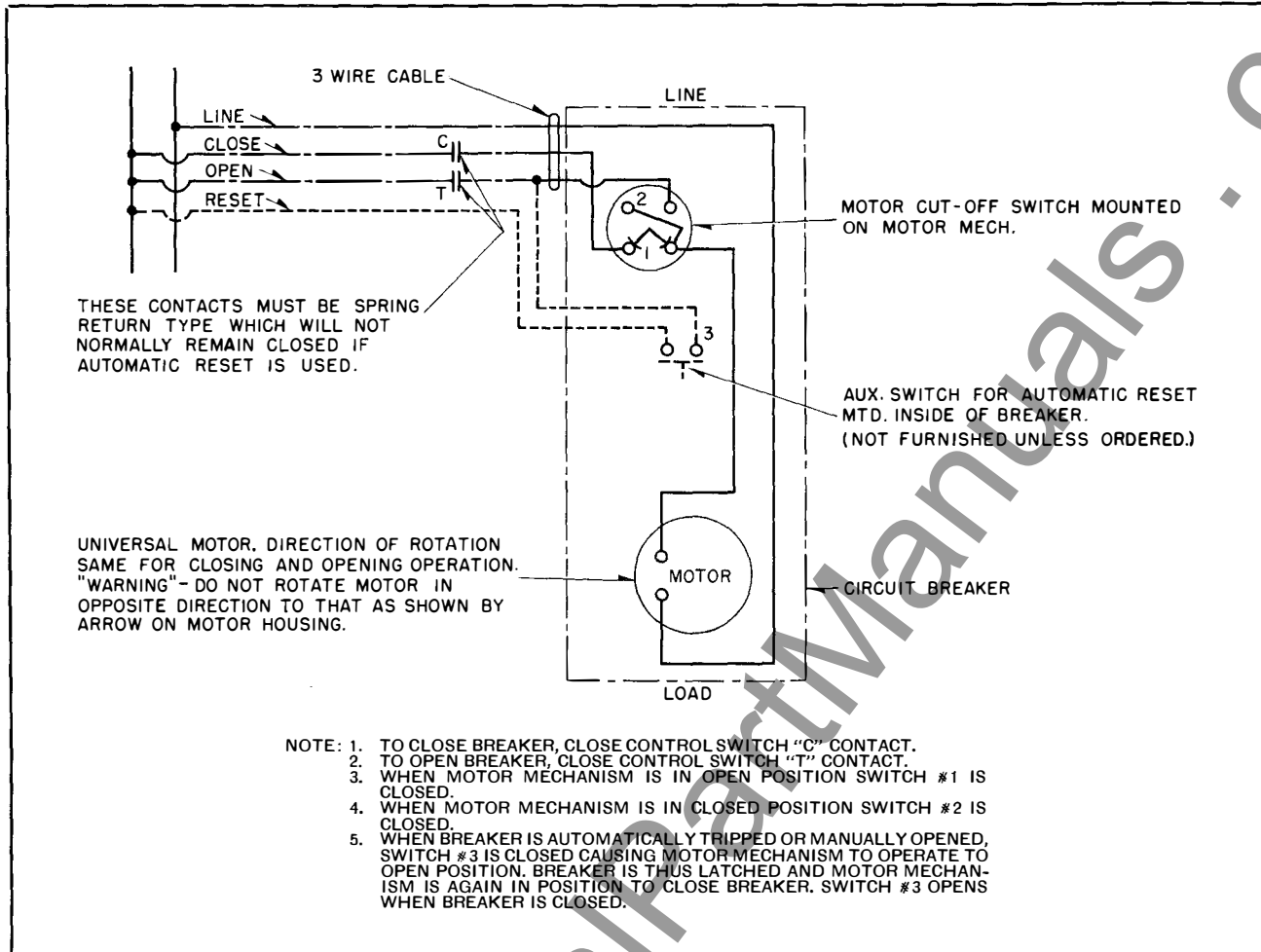


FIG. 2. Wiring Outline of Motor Operated Mechanism, with Dotted Line Circuit For Automatic Reset When Furnished.

The motor is of the series commutator type and operates on either a-c. or d-c.

The limit switch opens the motor circuit as soon as a closing, or opening, or resetting operation has been completed in response to a corresponding contact in the control circuit. This switch is of the rotary type with two segments, one for closing and one for opening or resetting. It is an integral part of the motor mechanism and it rotates in a definite relation to the position of the operating arm.

The centrifugal brake limits the speed of the motor and prevents overtravel of the motor mechanism. This brake consists of two weights spun against a brake band by the motor shaft.

Important. This motor-operated breaker has been adjusted at the factory for proper operation. Do not dismantle or change the relative position of any of the parts, since this may effect the operation and reduce the life of the apparatus.

INSPECTION

If it is necessary to remove the motor mechanism for inspection of the circuit breaker, proceed as follows: Remove the three $\frac{1}{2}$ inch nuts "A" Fig. 1, then pull off the motor mechanism and mounting plate as a unit. Remove the two $\frac{1}{4}$ inch, flathead screws that go through the handle. The operating handle assembly can now be pulled off and the circuit breaker cover removed. Assemble in the reverse order. Check the gap between the handle assembly and the crank. This should be $\frac{1}{8}$ of an inch at all positions of the crank. If the gap is not correct, loosen the two $\frac{1}{4}$ inch flat head screws that pass through the handle assembly and move the assembly toward or away from the crank as required. Then retighten the screws. The motor should be rotated manually to check the operation before electrical operation is attempted. This may be done by removing the spring clip and plate at the end of the motor housing and rotating the motor

shaft in the direction shown by the arrow. Be sure that the power supply is disconnected when this is done.

INSTALLATION

Front connected circuit breakers should be mounted by means of the four $\frac{3}{8}$ -16 studs and lock nuts supplied. These studs should be screwed as far as they will go into the four inserts in the back of the breaker base, then used to hold the unit to the mounting panel as shown in Fig. 1. Rear connected circuit breakers are mounted by means of the rear connecting studs passing through an insulating mounting panel as shown in Fig. 1. The unit is wired as shown in Fig. 2 or dotted line circuit, Fig. 2, if automatic reset is used.

The operating switch may be of the maintain contact or spring return type depending on the application. A maintain contact switch, interlocked so that only one set of contacts can be closed at one time is preferred if the automatic reset is not used. The "C" contact can not be of the maintained type if automatic reset is used because the breaker would automatically reclose if tripped by an overload and would cycle as long as the overload persisted.

OPERATION

The operating motor is a high torque motor whose direction of rotation is the same for the closing and opening operation. It is designed for intermittent operation. The unit should not be put through more than 10 complete closing and opening operations immediately following one another. The number of operations is not limited if the rate of operation is not greater than four per minute. Referring to Fig. 1, when the closing control contact is made,

the motor will rotate the crank through 180° at which time the motor cut-off switch will open that circuit to stop the motor and at the same time close a contact so that the crank will rotate through another 180° to open the breaker when the opening control contact is made. The control contact must be held through the entire closing or opening operation which requires approximately $\frac{1}{3}$ sec. for the closing operation and $\frac{1}{4}$ sec. for the opening operation. If an overload trips the breaker, the opening control contact must first be made to bring the handle to the open position to reset the breaker, then the closing control contact must be made to return the breaker to closed position.

AUTOMATIC RESET

Fig. 2 shows the method of wiring for automatic reset. An auxiliary switch connected across the opening control contact closes when the breaker contacts open. Thus, if the breaker is tripped, the motor will automatically operate to return the handle to the rest position and all that is necessary to reclose the breaker is to make the closing control contact.

It is important that the operating voltage be maintained within 10% of the nameplate marking on the motor. The unit will operate at 80% of the nameplate voltage, but the operation is slowed down and the motor will overheat.

MANUAL OPERATION

To operate the breaker by hand, pull out the knurled handle to disconnect the motor mechanism from the breaker handle. It is not necessary to replace the handle in its original position to operate electrically, as it will automatically return if the motor is operated.



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