Motor and Phase Rotation Tester

- **Complete phase-sequence and motor-rotation testing in one instrument**
- **Ensures correct phase hookup in one easy test**
- **Rugged and portable tester**
- **Performs additional polarity and continuity checks**

DESCRIPTION

The Motor and Phase Rotation Tester permits the electrical contractor or industrial maintenance electrician to permanently connect and tape the terminals of the motor being installed, without having to first energize the motor by a temporary hookup from a power source, if available, to determine motor rotation. Therefore, the test set eliminates the need for temporary connections that can be time consuming, costly and quite hazardous, particularly where many large, high-voltage motors are involved.

Also, certain types of drives should never be rotated in the wrong direction. In such cases, the temporary hookup or trial method, having a fifty-fifty chance of being wrong, can do serious harm.

The three motor leads on the left side of the test set are for attachment to the terminals of the motor being tested for rotation determination.

Fuses are inserted in the motor A and C test leads as protection in the event the user accidentally touches these leads to an energized circuit. These standard fuses are easily removed and replaced from their panel-mounted holders.

The three lines leading to the right of the test set are for direct attachment to energized ac power systems up to 600 volts to determine the system phase sequence.

A four-position switch selects the test to be made — system phase sequence, motor rotation and transformer polarity. The selector switch connects a D-size dry cell into the circuit when the rotation of a motor or the polarity of a transformer is being checked. In the OFF position, both the meter and the battery are disconnected from all circuits.

A push switch is connected in series with the battery and opens the circuit during transformer polarity testing.

The dry cell is easily removed and replaced from its panel-mounted holder by a coin-slot access cap.

The dc zero-center ammeter indicates correct or incorrect rotation or polarity by deflecting its pointer to the right or left. A zero or null adjuster is provided for the ammeter.

APPLICATIONS

The Motor and Phase Rotation Tester provides a positive way toidentify the leads of a disconnected polyphase motor; it also identifies true phase sequence of energized 60-Hertz ac power lines up to 600 volts. Both are necessary to ensure that a motor will rotate in a prescribed direction when energized.

There are three other important uses for this unique testing device: it can determine the polarity of power and instrument transformers; it can identify phase and polarity of winding sections of multiple-winding (delta- and star-connected) motors; and it can be used as a continuity tester in checking electrical circuits.

FEATURES AND BENEFITS

- Determines rotation direction of one-, two- or three-phase motors before connection to line
- Determines phase rotation or sequence of energized power circuits
- Determines polarity of instrument and power transformers
- Determines phase/polarity of unmarked motor windings
- Identifies true phase sequence of energized ac power lines up to 600 volts (Higher voltages can be tested by interposing a step-down transformer.)

SPECIFICATIONS

Input (specify one)

50/60 Hz or 25/50/60/400 Hz

Enclosure

The test set is enclosed in an ABS high-impact plastic case that has a handle and hinged, removable lid. The deep lid provides storage space for the instruction manual and test leads.

Dimensions

9 H x 7.5 W x 7.5 D in.
(23 H x 19 W x 19 W cm)

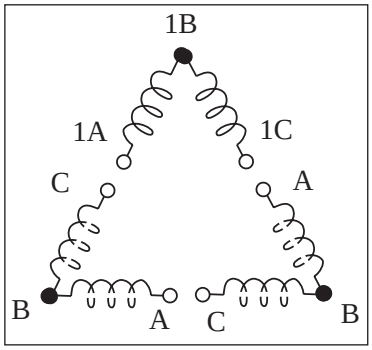
Weight

3.5 lb (1.6 kg)

Example Operation

Motor Connection for a 9-Wire, 3-Phase, Dual-Voltage, Single-Speed, Delta Connection.

In the delta-connected winding, one terminal in each group is common to two winding sections. This terminal can be identified by using the motor rotation circuit as a bridge. Connect all three MOTOR leads together. Set the selector switch to the MOTOR position. Operate the ZERO ADJ. control to bring the meter pointer to zero (center). Connect the three MOTOR leads to the three terminals of the group in any order. Observe the meter deflection. Reverse the A and B MOTOR leads. Again observe the deflection. Reverse the B and C MOTOR leads. Note the deflection. Return to the connection that gave the smallest deflection of the meter. At this point, the B MOTOR lead is connected to the common terminal. Now make a motor rotation test with the leads connected as above ; rebalance the tester if necessary, using the ZERO ADJ. control, and then turn the motor slightly in the direction in which it is desired to run. If no preferred direction is specified, turn it clockwise when viewed from the drive end. If the deflection is in the INCORRECT direction, reverse MOTOR leads A and C. When the CORRECT deflection is obtained, the terminals in the group should be marked according to the MOTOR lead markers. The number 1 should be used as a prefix to identify the group. Thus, the terminal connected to the A MOTOR lead is marked 1A. The common terminal is marked 1B, and the remaining terminal 1C. Select a second group of leads. Determine the common terminal and rotation in the same manner as described above. In tagging these terminals, the prefix number is temporarily omitted. The terminals are tagged A, B, C. If done properly, B will mark the common lead. At this stage, the identification of terminals has reached the point shown in the figure. It remains to be determined whether this second group belongs in the 2 or 3 position. This can be determined by an induced voltage test that indicates whether coil A-B or coil B-C is in phase with coil 1B-1C. By continuing to apply similar steps, the entire configuration can be determined. Similarly, appropriate modifications of the general procedure can be employed to determine other types of winding configurations.



First section identified in a 9-Wire, 3-Delta Motor

ORDERING INFORMATION

Item (Qty)	Cat. No.
Motor and Phase Rotation Tester	
50/60 Hz	560060
25/50/60/400 Hz	560400
Included Accessories	
Attached test leads	
Line, 6 ft [1.8 m]	
Motor, 4 ft [1.2 m]	
Fuses, standard 250 V, 3 A	
Instruction manual	AVTM56-Jb