

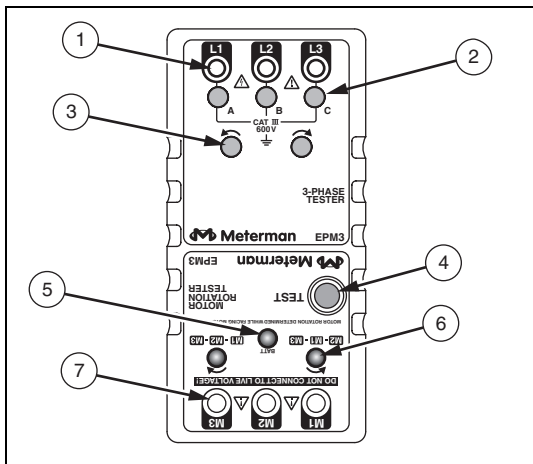


EPM3

Phase Sequence and Motor Rotation Tester

Users Manual





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②	Open phase indicators
③	Phase rotation indicators
④	Motor tester power switch
⑤	Motor tester power indicator
⑥	Motor rotation indicators
⑦	Motor rotation input terminals

EPM3 Phase Sequence and Motor Rotation Tester

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


Safety Information

The EPM3 Phase Sequence and Motor Rotation Tester conforms to CSA 22.2 -1010-1 and EN61010-1, CAT III 600 V.

To ensure safe operation and usage of this instrument, follow instructions in this manual. Failure to observe Warnings may result in SEVERE injury or death.

- It is recommended for use in distribution level and fixed installations, as well as lesser installations, and not for primary supply lines, overhead lines and cable systems.
- Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself. Never apply more than 600 V ac rms between the test lead and earth ground.
- Inspect the tester, test leads and accessories before each use. Do not use any damaged part.
- Never ground yourself when taking measurements. Do not touch exposed circuit elements or test probe tips.
- Do not operate the tester in an explosive atmosphere.
- Exercise extreme caution when: measuring voltage >20 V // current >10 mA // AC power line with inductive loads // AC power line during electrical storms // current, when the fuse blows in a circuit with open circuit voltage >600 V.
- Never replace a fuse with one of a different rating.
- Remove test leads before opening the case.
- Do not use in a manner not specified or the protection afforded by the instrument may be impaired.

Symbols Used in this Manual

	Dangerous Voltage		Refer to the manual
	Double insulated		Alternating Current
	Direct Current		Earth Ground
	Complies with EU directives		Canadian Standards Association
	Complies with TÜV		

The tester provides three functions in one unit, including open phase, phase sequence and motor rotation indication. This tester is ideal for installing conveyor lines, pump systems and interconnected drivers.

The EPM3 is two measurement devices. One half measures the phase sequence of a 3-wire system using the power of the system under test. Using lamp indicators, it will indicate the 3-phase sequence or it will indicate an open phase situation. The other half of the EPM3 measures 3-phase motor rotation on an unpowered motor using the EPM3's internal 9 volt battery. The unit will indicate whether the motor shaft has clockwise or counter-clockwise rotation.

Features:

- Identifies 3-phase sequence and open phase check
- Motor shaft rotation
- Battery operated
- Meets EN61010 safety requirements
- Supplied with three CAT III rated large alligator clips and color coded test leads






Read all Safety Information before using this tester.

Making Measurements

3-Phase Rotation Test



This instrument only indicates that voltage is present, not the voltage level. Verify the actual voltage with a multimeter. Using the wrong voltage can damage a motor.

1. Connect the three color coded test leads to the 3-phase input terminals, L1 (Red) - L2 (Green) - L3 (Blue) also know as A-B-C or R-S-T. See Figure 1.
2. Connect the three color coded alligator clips to the terminals of a 3-phase power source. The connection order is optional. **Use extreme caution in this high voltage situation.**
3. Confirm that all three lights below the test lead inputs on the EPM3 are ON. If one or more of the three lights is OFF, there is an open phase condition. Correct the power source problems before proceeding (See Open Phase Test later in this manual). If the Open Phase tests are good, the EPM3 is defective. Repair or replace the EPM3 before proceeding.
4. If all three lamps are ON, check the phase rotation indication for the rotation direction, clockwise () or counter-clockwise () indicator.
5. If the counter clockwise lamp is ON, reverse the connections of any two of the three alligator clips for clockwise rotation. **Use extreme caution in this high voltage situation.**
6. The phase sequence is correct for clockwise () rotation when the clockwise lamp is ON and the power source terminals are connected by the RED, GREEN, and BLUE alligator clips to L1, L2, and L3. Remove power and label the power source wires.

Open Phase Test

⚠⚠ Caution

The multimeter used for this test should be properly rated for the circuit under test.



1. Connect a multimeter (set to VAC and the voltage range expected) V input to the phase wire in question and the COM input to neutral or ground to check the phase voltage. **Use extreme caution in this high voltage situation.**
2. Verify that the two other phases are working properly and that the 3-phase to phase voltages are correct. If a problem is found, correct the problem before returning to the 3-phase rotation test.

Motor Rotation Test

This test can be used to verify the shaft rotation and the M1-M2-M3 connections or to determine the M1-M2-M3 connections on a motor that is not marked.

⚠⚠ Warning

Make all connections with circuits unpowered. If the clockwise or counterclockwise RED indicator is ON before rotating the motor shaft, voltage is present. Stop measuring. Remove the test leads and turn off the external power.

1. Use a multimeter to verify that no voltage is present on the motor windings.
2. Connect the color coded test leads to the three motor input terminals M1- M2- M3. Press the power button (See Figure 2). The green indicator light will be ON.
3. Facing the motor shaft, hand rotate the motor shaft clockwise.
4. If the clockwise indicator () is ON, the M1-M2-M3 connections are correct for clockwise rotation.
5. If the counterclockwise () indicator is ON, the M1-M2-M3 connections are correct for counterclockwise rotation.
6. If the motor rotation direction is wrong, reverse any two of the M1-M2-M3 connections and repeat the test.

After 3-phase rotation and motor phasing are verified:

1. Turn off power at the source.
2. Connect the previously identified power wire L1 to motor wire M1. Repeat the connections for L2 to M2 and L3 to M3. See Figure 3.
3. Inspect the connections for electrical safety.

The motor will rotate in the desired direction when power is applied.

Maintenance

If the EPM3 appears to operate incorrectly, check the following items:

1. Review the operating instructions to ensure the meter is being used correctly.
2. Inspect and test the continuity of the test leads.
3. Make sure the battery is in good condition. Replace a low battery immediately.
4. Check the condition of the fuses.

⚠️⚠️ WARNING

To avoid electrical shock, remove the test leads from the EPM3 and the test circuit before accessing the battery or the fuse.

Battery and Fuse Replacement

To access these parts, you must first remove the rear cover of the EPM3. The rear cover is held in place with two screws. After removing the screws, you can easily remove and replace the battery or a fuse. To replace a fuse, pry it from the retaining clips using a small screwdriver. See Figure 4.

Use the following replacement parts:

Battery: 9 V NEDA 1604, IEC 6F22

Phase Sequence Fuse: Fast Blow 200 mA/600 V (Meterman FP900)

Motor Rotation Fuse: Fast Blow 100 mA/250 V (Littel Fuse 216.100)

Cleaning and Storage

Periodically wipe the case with a damp cloth and detergent. Do not use abrasives or solvents. Remove the battery if the tester is not in use for periods longer than 60 days.

Limited Warranty and Limitation of Liability

Your Meterman product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Meterman's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Meterman Test Tools Service Center or to a Meterman dealer or distributor. See Repair Section for details. **THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STATUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY.** Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Specifications

General Specifications

Operating Environment: 0 °C to 40 °C at <80 % R.H.

Power: Single standard 9 V battery, NEDA 1604, JIS 006P, IEC 6F22

Battery life: Approximately 200 hours typical with carbon-zinc battery

Low battery indication: The BATT LED does not come ON when TEST button is pressed

Dimensions: 153(L) x 72(W) x 35(D) mm. (6.02 x 2.83 x 1.37 in)

Weight: Approximately 218 g (7 oz) including battery

Environment: Indoor use

Altitude: 2000 m (6561 ft.)

Overload protection: 600 V ac

Accessories: Test Leads (red, green, and blue) with alligator clips (TL-EPM3), Soft Vinyl Case, Users Manual, Battery

Agency Approvals



Safety: Conforms to EN61010-1:2001; CAT III 600V, Pollution degree 2, Class 2; CSA 22.2 -1010-1, and EN61557-7

EMC: Conforms to EN61326-1. This product complies with requirements of the following European Community Directives: 89/ 336/ EEC (Electromagnetic Compatibility) and 73/ 23/ EEC (Low Voltage) as amended by 93/ 68/ EEC (CE Marking). However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Electrical Specifications

Phase Sequence

Input Voltage: 3 phase to phase inputs - 100 V ac to 600 V ac max.

Frequency: 45 to 70 Hz

Operating time: 10 minutes ON maximum at 600 V ac. 10 minutes OFF minimum at 600 V ac.

3-Phase load: Approx. 7 mA per phase of ac power source

Motor Rotation

Operating time: 10 minutes ON maximum. 10 minutes OFF minimum.

Motor Rotation tester field: 14 mA of 9 V battery

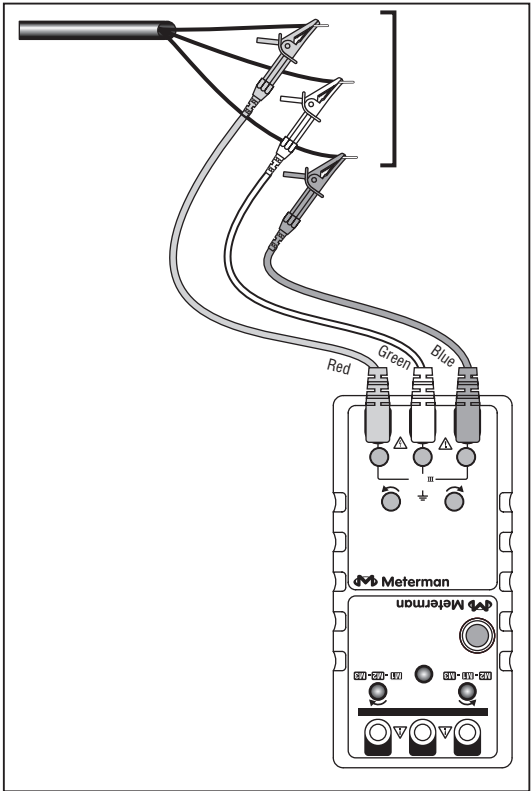


Figure 1

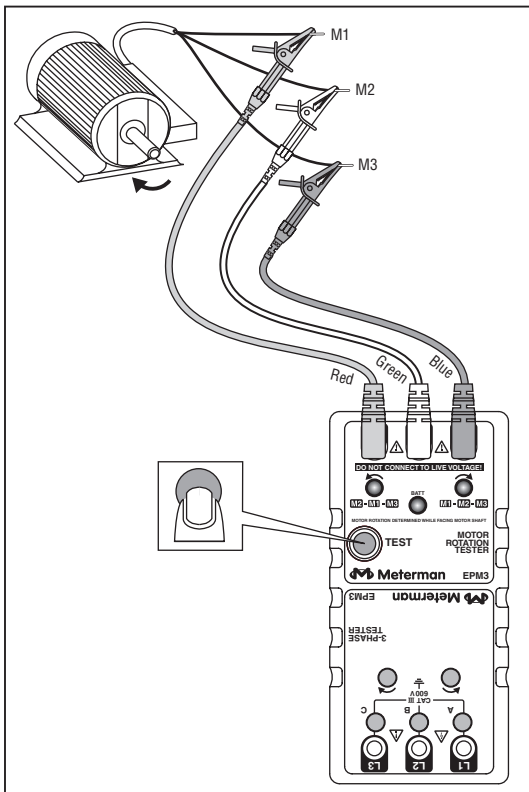


Figure 2

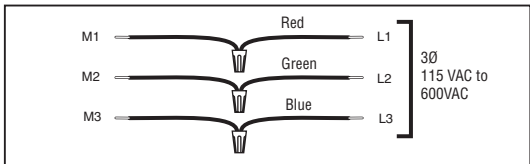


Figure 3

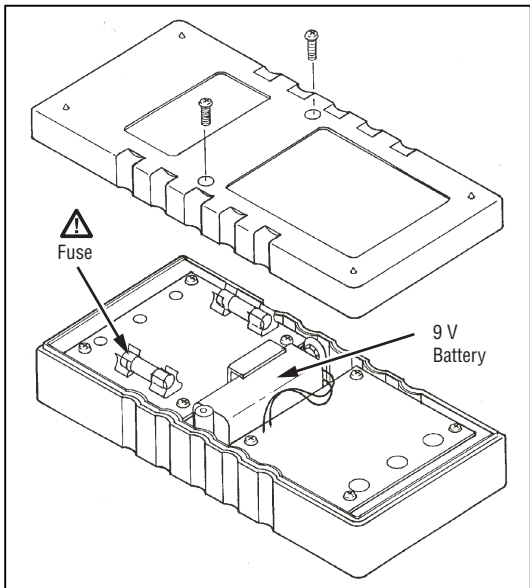


Figure 4