User Manual
ENGLISH

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

Phase & Motor Rotation Meter

Model 6611

ELECTRICAL TEST TOOLS

Measure Up
WITH AEMC® INSTRUMENTS

Statement of Compliance

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

We guarantee that at the time of shipping your instrument has met the instrument's published specifications.

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services.

Serial #: _____

Catalog #: 2121.90

Model #: 6611

Please fill in the appropriate date as indicated:

Date Received: _____

Date Verification Due: _____

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CHAUVIN ARNOUX GROUP

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1. INTRODUCTION

Thank you for purchasing an AEMC® Instruments **Phase & Motor Rotation Meter Model 6611**.

For the best results from your instrument and for your safety, you must read the enclosed operating instructions carefully and comply with the precautions for use. Only qualified and trained operators should use this product.

1.1 International Electrical Symbols

	Signifies that the instrument is protected by double or reinforced insulation.
	**CAUTION - Risk of Danger!** Indicates a **WARNING**. Whenever this symbol is present, the operator must refer to the user manual before operation.
	Indicates a risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	Indicates Important information to acknowledge
	Battery
	Ground/Earth
	AC or DC
	This product complies with the Low Voltage & Electromagnetic Compatibility European directives.
	In the European Union, this product is subject to a separate collection system for recycling electrical and electronic components in accordance with directive WEEE 2012/19/EU.

1.2 Definition of Measurement Categories (CAT)

CAT IV: Corresponds to measurements performed at the primary electrical supply (< 1000 V).

Example: primary overcurrent protection devices, ripple control units, and meters.

CAT III: Corresponds to measurements performed in the building installation at the distribution level.

Example: hardwired equipment in fixed installation and circuit breakers.

CAT II: Corresponds to measurements performed on circuits directly connected to the electrical distribution system.

Example: measurements on household appliances and portable tools.

1.3 Precautions for Use ⚠

- This instrument complies with safety standard IEC 61010-1.
- For your own safety, and to prevent any damage to your instrument, you must follow the instructions given in this manual.
- This instrument can be used on CAT IV electrical circuits not exceeding 600 V with respect to earth. It must be used indoors, in an environment not exceeding pollution level 2, at an altitude of not more than 6562 ft (2000 m). The instrument can therefore be used in complete safety on (40 to 850) V three-phase networks in an industrial environment.
- For safety reasons, you must use only measurement leads having a voltage rating and category at least equal to those of the instrument and compliant with standard IEC 61010-031.
- Do not use if the housing is damaged or not correctly closed.
- Do not place your fingers near unused terminals.
- If the instrument is used other than as specified in this manual, the protection provided by the instrument may be impaired.

- Do not use this instrument if it seems to be damaged.
- Check the integrity of the insulation of the leads and of the housing. Replace damaged leads.
- Be prudent when working in the presence of voltages exceeding 60 VDC or 30 VRMS and 42 Vpp; such voltages can cause a risk of electrocution. The use of individual protections is recommended in some cases.
- Always keep your hands behind the physical guards of the probe tips or alligator clips.
- Always disconnect all leads from the measurement and from the instrument before opening the housing.

1.4 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim.

1.5 Ordering Information

Phase and Motor Rotation Meter Model 6611 ..... **Cat. #2121.90**
Includes meter, (3) color-coded test leads (red, black, blue), (3) alligator clips (black), soft carrying case and a user manual.

1.5.1 Accessories and Replacement Parts

Soft carrying case.....**Cat. #2117.73**

Set of (3) color-coded leads with
(3) black alligator clips CAT III 1000 V 10 A..... **Cat. #2121.55**

2. PRODUCT FEATURES

2.1 Description

This three-in-one test tool is a must for any plant maintenance staff and will identify proper sequencing for three phase power very quickly and easily.

This is also an ideal tool for measuring the proper rotation of motors, conveyors, pumps and other electrical devices interconnected on the power line system before installation.

NOTE: The Model 6611 does not require fusing because the inputs are protected by a high impedance circuit which limits the current to a safe value.

This meter provides the following functions:

- determination of the direction of phase rotation
- presence or absence of phase
- determination of the direction of rotation of a motor with or without connection
- determination of the activation of a solenoid valve without connection

2.2 Control Features

1	Test Lead Input Terminals
2	L1 Phase Indicator
3	L2 Phase Indicator
4	L3 Phase Indicator
5	Clockwise Rotation Indicator
6	Counterclockwise Rotation Indicator
7	ON/OFF Indicator
8	ON/OFF Button
9	Back Label
10	Battery Compartment & Cover Screw

3. OPERATION

3.1 Determine Rotary Field Direction

On a three-phase electrical network:

1. Connect one end of the test leads to the Phase & Motor Rotation Meter, make sure the L1, L2 and L3 test leads are connected to the corresponding input jacks.
2. Connect the alligator clips to the other end of the test leads.
3. Connect the alligator clips to the three mains phases, **PRESS** the **ON/OFF** Button, the green **ON** indicator shows that the instrument is ready for testing.
4. Either the Clockwise or Counterclockwise Rotary indicator illuminates showing the Type of rotary field direction present.
5. The rotary indicator lights even if the neutral conductor, N, is connected instead of the Test lead input jacks.
6. Refer to Figure 2 shown in § 3.3.1 (also shown on the back of the Phase & Motor Rotation Meter) for more information.

3.2 Instrument Front

3.2.1 Faceplate

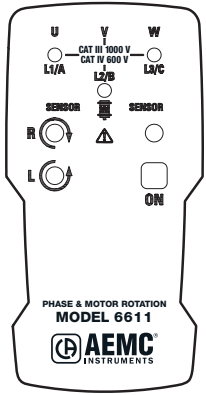

Figure 1

3.3 Instrument Back

3.3.1 Instruction Label/Safety Information

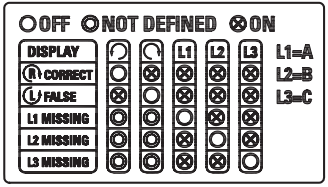

Figure 2

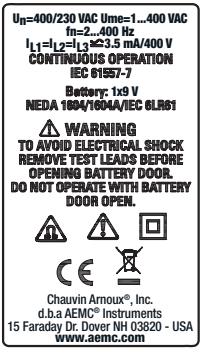

Figure 3

WARNING: The wrong direction of rotation may be displayed if a lead is connected in error to the neutral conductor. Refer to the instrument's back label (see Figure 2 above) for a summary of the various display possibilities.

3.4 Non-Contact Rotary Field Indication

1. Disconnect all test leads from the Phase & Motor Rotation Meter.
2. Position the Indicator on the motor so that it is parallel to the length of the motor shaft, the Indicator should be one inch or close to the motor.
3. **PRESS** the **ON/OFF** Button, the green **ON** indicator shows that the instrument is ready for testing.
4. Either the Clockwise or Counterclockwise Rotary indicator illuminates showing the Type of rotary field direction present.

NOTE: The indicator will not operate with engines controlled by frequency converters. The bottom of the Phase & Motor Rotation Meter should be oriented towards the drive shaft. See the Orientation Symbol on the Phase & Motor Rotation Meter.

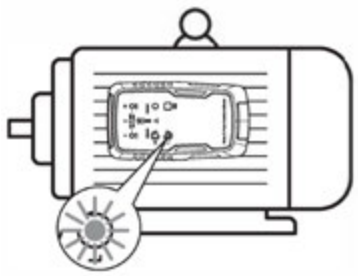

Figure 4

See the table below for the minimum motor diameter and number of pole pair to obtain a reliable test result.

Number of Pole Pair	Rotary Number of Rotary Field (1/mm) at Frequency (Hz)			Angle Between Poles	Minimum Ø of Motorcase
	16 2/3	50	60	°	cm
1	1000	3000	3600	60	5.3
2	500	1500	1800	30	10.7
3	333	1000	1200	20	16.0
4	250	750	900	15	21.4
5	200	600	720	12	26.7
6	167	500	600	10	32.1
8	125	375	450	7.5	42.8
10	100	300	360	6	53.5
12	83	250	300	5	64.2
16	62	188	225	3.75	85.6

3.5 Determine The Motor Connection

1. Connect one end of the test leads to the Phase & Motor Rotation Meter, make sure the L1, L2 and L3 test leads are connected to the corresponding jack.
2. Connect the alligator clips to the other end of the test leads.
3. Connect the alligator clips to the motor connections, L1 to U, L2 to V, L3 to W.
4. **PRESS** the **ON/OFF** Button, the green **ON** indicator shows that the instrument is ready for testing.
5. Turn the motor shaft half a revolution towards the right.

NOTE: The bottom of the Phase & Motor Rotation Meter should be oriented towards the drive shaft. See the Orientation Symbol on the Phase & Motor Rotation Meter.

NOTE: Either the Clockwise or Counterclockwise Rotary indicator illuminates showing the type of rotary field direction present.

3.6 Magnetic Field Detection

- To detect a magnetic field, place the Phase & Motor Rotation Meter to a solenoid valve.
- A magnetic field is present if either the Clockwise or the Counterclockwise.

4. SPECIFICATIONS

4.1 Determine Rotary Field Direction

Nominal Voltage Rotary Direction	(1 to 400) VAC
Nominal Voltage Phase Indirection	(120 to 400) VAC
Frequency Range (fn)	(2 to 400) Hz
Test Current (In per phase)	Less than 3.5 mA

4.2 Non-Contact Rotary Field Indication

Frequency Range (fn)	(2 to 400) Hz

4.3 Determine The Motor Connection

Nominal Test Voltage (U me)	(1 to 400) VAC
Nominal Test Current (In per phase)	Less than 3.5 mA
Frequency Range (fn)	(2 to 400) Hz

4.4 Electrical

Battery	9 V Alkaline, IEC 6LR61
Current Consumption	Max 20 mA
Battery Life Minimum	1 year for average use

4.5 Mechanical

Dimensions	(5.3 x 2.95 x 1.22) in (135 x 75 x 31) mm
Weight	4.83 oz (137 g)

4.6 Environmental

Operating Temperature	(32 to 104) °F (0 to 40) °C
Storage Temperature	(-4 to 122) °F (-20 to 50) °C; RH < 80 %
Operating Humidity	(15 to 80) % RH
Operating Altitude	6562 ft (2000 m)
Pollution Degree	2

4.7 Safety

Safety Rating	CAT IV 600 V, 1000 V CAT III IEC 61010-1, IEC 61557-7, Tightness : IP40 (as per IEC 60529 Ed.92)
Double Insulation	Yes
CE Mark	Yes

5. MAINTENANCE

5.1 Battery Replacement

WARNING: Always disconnect all leads before replacing a battery or fuse.

The Phase & Motor Rotation Meter uses a 9 V battery (supplied).

To replace the battery, follow these steps.

1. Place the instrument face down on a nonabrasive surface and loosen the battery compartment cover screw with a screwdriver.
2. Lift the battery access lid away from the instrument.
3. Remove battery and replace with new 9 V battery. Observe the battery polarity shown in the battery compartment.
4. Secure the battery access lid back in position with the screw.

NOTE: Do not treat spent alkaline batteries as ordinary household waste. Take them to the appropriate collection facility for recycling.

5.2 Cleaning

WARNING: To avoid electrical shock or damage to the instrument, do not allow water to get inside of the case.

The instrument should be cleaned periodically to keep the LCD clear and prevent the buildup of dirt and grease around the instrument's buttons.

- Wipe the case with a soft cloth lightly moistened with mild, soapy water.
- Dry completely with a soft, dry cloth before using again.
- Do not allow water or other foreign substances into the case.
- Never use alcohol, abrasives, solvents or hydrocarbons.

5.3 Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that the instrument be sent back to our factory Service Center at one-year intervals for recalibration or as required by other standards or internal procedures.

5.4 Technical Assistance

If you are experiencing any technical problems or require any assistance with the proper operation or application of your instrument, please call, e-mail or fax our technical support team.

5.5 Limited Warranty

The instrument is warrantied to the owner for a period of two years from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with, abused, or if the defect is related to service not performed by AEMC® Instruments.

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