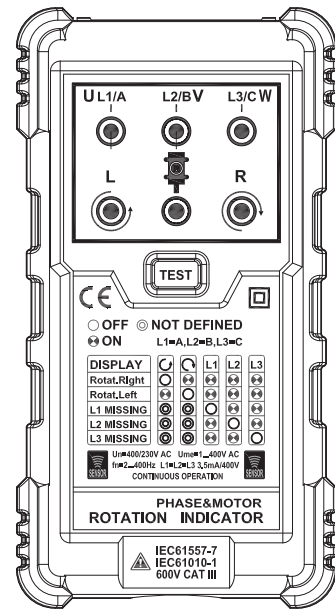


Motor and Phase Rotation Indicator



Designed and Conforms to
IEC61010-1
CAT.III 600V



PM5900



Y01-04-0034 A0



Before using the instrument, please read this manual carefully, and save it well for future using.

140*103mm

Safety Notes



Read carefully this manual to avoid electric shock, burning or personal injury.

Caution: Cases which could result in instrument damage or wrong test results.

Warning: Cases or actions which could result in personal injury to the users.



Warning

There is danger of electric shock, serious injury or death caused by touching electrical appliance. To avoid personal injury or death caused by electric shock, you should strictly follow this manual.

- ⇒ Read all contents included in this manual.
- ⇒ Use this product in accordance with this manual, or else, protection function provided by this product will be out of service or weakened.
- ⇒ Do not use testing line that is damaged or has bare metal.
- ⇒ Do not use damaged product such as the case cracks.
- ⇒ Do not use the product in electrical storm, damp or thunderstorm environments.





- ⇒ Do not use the product around inflammable gas, high dust or vapor environments.
- ⇒ Do not connect the product to power supply with a voltage exceeding test working voltage.
- ⇒ Do not use the product with missing or wrongly installed battery back cover.
- ⇒ Must separate testing line from the tested line before the battery aback cover is opened.
- ⇒ Do not try to repair this product. User-replaceable parts are not incorporated in this product.
- ⇒ For your safety, keep in mind “safety first” .
- ⇒ Electric shock is possibly caused if voltage exceeds 30V AC or 60V DC.
- ⇒ Apply proper personal safety equipments, such as safety glasses, mask, insulation gloves, insulation shoes as well as insulation pad, etc.
- ⇒ Do not make yourself grounded when working on live power lines.
- ⇒ Always connect grounding line with null line when using alligator clip testing line or adapter jumper.

Overview

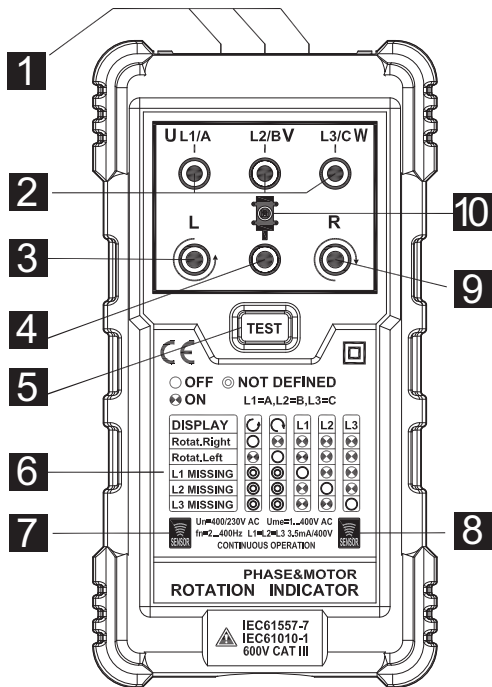
Motor and Phase Rotation Indicator is used to test magnetic field direction of three-phase system, phase rotation, motor rotation direction. Without a need to link testing line, the

motor rotation direction can be decided by placing this indicator above the motor and aligning it with motor drive shaft. It is durable, reliable and light-weight handheld device, which is necessary tool for those who often install, repair or maintain three-phase system or motor.

Symbol Instruction

	<p>Important safety information. Please read this manual before use. Wrong use may lead to the equipment or its components are damaged.</p>
	<p>Grounding</p>
	<p>Double insulation protection</p>
	<p>In compliance with EU(European Union) directives</p>
<p>CAT II</p>	<p>Measurement category II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low voltage mains installation.</p>
<p>CAT III</p>	<p>Measurement category III is applicable to test and measuring circuits connected to the distribution part of the building' s low voltage mains installation.</p>
<p>CAT IV</p>	<p>Measurement category IV is applicable to test and measuring circuits connected at the source of the building' s low voltage mains installation.</p>

Instruction of Indicator Parts



- 1 Input jack:** Used to test phase sequence input of three-phase voltage.
- 2 Phase line indicator light:** Used to indicate phase line L1, L2 and L3.

- 3 **Counter-clockwise indicator light.**
- 4 **Power light.**
- 5 **Test button:** Press this button to enter test.
- 6 **Description of indicator light:** Simple description of status combination of indicator light.
- 7 **Left sensor position:** Mark the position of built-in sensor.
- 8 **Right sensor position:** Mark the position of built-in sensor.
- 9 **Clockwise indicator light.**
- 10 **Direction indication symbol:** The direction of placing indicator when motor is tested.

Instruction of Indicator Use

Contact type phase sequence test



1. Connect one end of test lead to indicator (connect L1, L2 and L3 test lead to the corresponding input jack) and another end to alligator clip.
2. When three-phase line is tested, it will clamp the end of test line with alligator clip to three phase lines in three-phase system (e.g. U, V and W terminal in three-phase motor).
3. Press “TEST” button. The power light turns green, indicating the indicator is ready for test. “Clockwise rotation (R)” or “Counter-clockwise rotation (L)” indicator light is on, indicating L1-L2-L3 of three-phase system connected to the indicator is “positive phase” or “negative phase” .



Caution

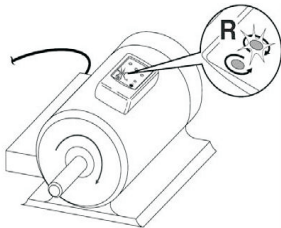
The rotation indicator light will be still on if non-energized conductor is connected and L1, L2 or L3 test lead is not connected. Please refer to the detailed information below, the description of status combination of indicator:

○ OFF ⊙ NOT DEFINED
 ⊗ ON L1=A,L2=B,L3=C

DISPLAY			L1	L2	L3
Rotat.Right	○	⊗	⊗	⊗	⊗
Rotat.Left	⊗	○	⊗	⊗	⊗
L1 MISSING	⊙	⊙	○	⊗	⊗
L2 MISSING	⊙	⊙	⊗	○	⊗
L3 MISSING	⊙	⊙	⊗	⊗	○

Non-contact type magnetic field rotation direction test (motor rotation direction test)

1. Remove test line from the indicator.
2. Place the indicator above motor and make it parallel to motor driving shaft body. Make the bottom of indicator face toward motor driving shaft. The distance from the indicator to motor shall be no more than 2.5 cm. See below.
3. Press "TEST" button. The power light turns green, indicating the indicator is ready for test. "Clockwise rotation (R)" or "Counter-clockwise rotation (L)" indicator light is on, indicating the motor is in "clockwise rotation" or "counter-clockwise rotation". See below. .



 **Caution**

Non-contact type magnetic

field rotation direction test is applicable to single-phase and three-phase motor. If motor is controlled by transducer, the indicator can not normally test the rotation direction of motor. When non-contact type test is made, please get the coil of motor close to the sensor of indicator as much as possible so as to get accurate results. To obtain reliable test results for motor rotation, please refer to the table which includes the minimal diameter of motor and number of pole pair.

Number of Pole Pair	Magnetic field rotations at frequency (Hz) below (1 rev/min)			Angle between Poles	Minimal Size of Motor Case \varnothing
	16 2/3	50	60	°	Centimeter (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

Confirm motor wiring

1. Connect one end of test line to the indicator. Correctly connect L1, L2 and L3 test line to corresponding input jack. Connect alligator clip to the other end of test line.
2. Clamp alligator clip to motor connector, L1 connected to U, L2 to V and L3 to W.
3. Press "TEST" button. The power light turns green, indicating the indicator is ready for test.
4. Half turn motor driving shaft to right.

Detect magnetic field

If intend to detect magnetic field, you should place the indicator into electromagnetic valve. If "clockwise rotation (R)" or "counter-clockwise rotation (L)" indicator light is on, it means the magnetic field exists.

General technical parameters

- Temperature:
Operating: 0 ~ 40°C, maximal 80 % relative humidity
(non-condensing) .
Storage: -10 ~ 50 °C, maximal 80 % relative humidity
(non-condensing, battery not included)
- Altitude: <2000m(meter)
- Anti-explosion type: IP 40
- Safety class: IEC61010 -1 600V CATⅢ, pollution class II
- Maximal working voltage: 400V AC voltage
- Nominal voltage (tested at rotation direction) : 2 ~ 400V AC
voltage, 2 ~ 400Hz
- Nominal voltage (tested at phase sequence) : 120 ~ 400V AC
voltage, 2 ~ 400Hz
- Test current (per phase) : <3.5mA
- Battery: 1.5V/AA, 3
- Size: 125mm x 66mm x 30mm
- Weight: approx. 90 g (battery not included)

Maintenance

This section provides the basic maintenance information.

Do not attempt to repair or service this instrument unless you are qualified to do so and have the relevant calibration, performance test and service instructions.

Periodically wipe the case with a damp cloth and mild detergent.

Do not use abrasives or chemical solvents.

Replace battery

Replace the battery as follows:

- ① Screw out the bolts of battery cover with screwdriver.
- ② Remove battery cover and old battery.
- ③ Replace new battery with equivalent specification.
- ④ Install battery cover and tighten the back cover with screwdriver.