INSTRUCTION MANUAL

MT935

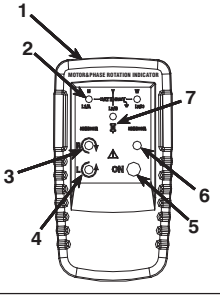
PHASE ROTATION METER WITH ROTARY FIELD DIRECTION

Introduction
The Motor and Phase Rotation meter is a handheld, battery-operated instrument designed to detect the rotary field of three-phase systems and determine motor rotation direction.

Symbols
The following symbols appear on the Motor & Phase Rotation Meter or in this manual.

	Risk of electric shock		Earth
	Risk of danger. Important information see manual		AC or DC
	Hazardous Voltage	CE	Conforms to EU directives
	Equipment protected by double or reinforced insulation	CAT III	Over voltage (installation) Cat III, pollution Degree 2 per IEC1010-1 refers to the level of impulse withstand voltage protection provided. Equipment of Over voltage CAT III is equipped in fixed installations (e.g. electricity meter and primary over-current protection equipment.
	Battery		Recycling Information

Elements of the Motor & Phase Rotation Meter



1. Test lead input jack
2. L1, L2, L3 Indicators
3. Clockwise rotation LCD indicator
4. Counter-clockwise rotation LCD indicator
5. ON/OFF Button
6. ON/OFF Indicator
7. Orientation Symbol

Figure 1. Motor & Phase Rotation Meter

Using the Motor & Phase Rotation Meter
Determine the Rotary Field Direction
To determine the rotary field direction:

1. Connect one end of the test leads to the motor & phase rotation indicator. Make sure the L1, L2, and L3 test leads are connected to the corresponding input jacks.
2. Connect the test probes to the other end of the test leads.

3. Connect the test probes to the three main phases. Press the ON/OFF button. The green ON indicator shows that the instrument is ready for testing. Either the clockwise or counter clockwise rotary indicator illuminates showing the type of rotary field direction present.
4. The rotary indicator lights even if the neutral conductor, N, is connected instead of the test lead input jacks. Refer to Figure 2 (also shown on the back of the motor and phase rotation indicator) for more information.

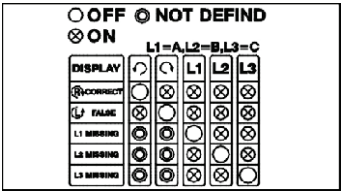


Figure 2. Phase Indication Table (shown on the rear of the Motor and Phase Rotation Meter)

Non-Contact Rotary Field Indication

For non-contact rotary field indication:

1. Disconnect all test leads from the Motor and Phase Rotation Meter.
2. Position the meter on the motor so that it is parallel to the length of the motor shaft. The meter should be one inch or close to the motor. See Figure 3.
3. Press the ON/OFF button. The green ON indicator shows that the instrument is ready for testing. Either the clockwise or counter clockwise 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 Motor and Phase Rotation meter should be oriented towards the drive shaft. See the orientation symbol on the Motor and Phase Rotation meter

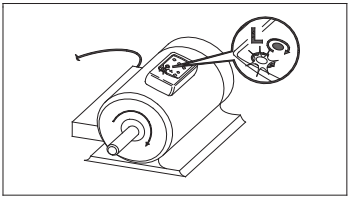


Figure 3. Motor Rotation

See table 2 for the minimum motor diameter and number of pole pair to obtain a reliable test result.

Table 2. Reliable Motor Test Requirements

Number of pole pair	Rotary Number Of Rotary Field (1/min) at Frequency (Hz)			Angel Between poles	Min. Ø of Motorcase
	16⅔	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

Determine the Motor Connection

1. Connect on end of the test leads to the motor and phase rotation meter. Make sure the L1, L2 and L3 test leads are connected to the corresponding jack.
2. Connect the croc clamps to the other end of the test leads.
3. Connect the croc clamps 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 motor and phase rotation indicator should be oriented towards the drive shaft. See the orientation symbol on the motor and phase rotation meter. Either the clockwise or counter clockwise rotary indicator illuminates showing the type of rotary field direction present.

Magnetic Field Detection

To detect a magnetic field, place the motor and phase rotation meter to a solenoid valve. A magnetic field is present if either the clockwise or the counter clockwise rotary indicator illuminates.

Note:

The motor and phase rotation meter contains alkaline batteries. Do not dispose of these batteries with other solid waste. Used batteries should be disposed of by a qualified recycler or hazardous materials handler.

The motor and phase rotation meter uses a 9V battery. To replace the battery, follow these steps.

1. Place the motor and phase rotation meter face down on a non-abrasive surface and loosen the battery-door screw with a screwdriver.
2. Lift the battery access lid away from the meter
3. Observe the battery polarity shown in the battery compartment.
4. Secure the battery access lid back in position with the screw.

Safety Information

Caution identifies conditions and actions that may damage the MT935. Warning identifies conditions and actions that pose hazard to the user.

Read First: Safety Information

To avoid possible electric shock or fire, do the following:

- Read the following safety information carefully before using or servicing the instrument.
- Adhere to local and national safety codes.
- Protective equipment must be used to prevent shock and injury.
- Use of instrument in a manner not specified by the manufacturer may impair safety features/protection provided by the equipment.
- Avoid working alone.
- When using the probes, keep fingers away from probe contacts. Keep fingers behind the finger guards on the probes.
- Measurements can be adversely affected by impedances of additional operating circuits connected in parallel or by transient currents.
- Verify operation prior to measuring hazardous voltages (voltages above 30V AC RMS, 42V AC peak and 60V DC).
- Do not use the meter with any parts removed.
- Do not use the meter around explosive gas, vapor or dust.
- Do not use the meter in a wet environment.

Specifications

Phase Rotation	Clockwise or Anti-clock wise
Visual Indication	LCD
Operating Temperature	0°C to 40°C
Humidity	15 to 80%
Operating Altitude	2000m
Pollution Degree	2
Type of Protection	IP40
Battery	9V
Current Consumption	Max 20mA
Dimensions	130 x 69 x 32mm

Weight	130g
Electrical Safety	DIN VDE 0411,IEC 61010 DIN, VDE 0413-7, IEC 61557/EN61557-7
Protection Level	CAT III 600V
Rotary Field Direction	
Nominal Voltage Rotary Direction	1 to 400V AC
Nominal Voltage Phase Indirection	120 to 400V
Frequency	2 to 400Hz
Test Current (per phase)	Less than 3.5mA
Non-Contact Rotary Field Indication	
Frequency	2 to 400Hz
Motor Connection	
Nominal Test Voltage (U me)	1 to 400V AC
Nominal Test Currents (per phase)	Less than 3.5mA
Frequency (fn)	2 to 400Hz

MAJOR TECH (PTY) LTD

South Africa

www.major-tech.com

sales@major-tech.com

Australia

www.majortech.com.au

info@majortech.com.au