# PC15250 Mk2
# PHASE SEQUENCE INDICATOR

## Instruction Manual



MARTINDALE ELECTRIC

**GENERAL SAFETY INFORMATION: Always read before proceeding.**

**Warning**
**These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.**

**In order to avoid the danger of electrical shock, it is important that proper safety measures are taken when working with voltages exceeding 30V AC rms, 42V AC peak or 60V DC.**

**This product must only be used by a competent person capable of interpreting the results under the conditions and for the purposes for which it has been constructed. Particular attention should be paid to the Warnings, Precautions and Technical Specifications. Always check the unit is in good working order before use and that there are no signs of damage to it. Do not use if damaged.**

**Where applicable other safety measures such as use of protective gloves, goggles etc. should be employed.**

**Please keep these instructions for future reference. Updated instructions and product information are available at: www.martindale-electric.co.uk**

**REMEMBER: SAFETY IS NO ACCIDENT**

**MEANING OF SYMBOLS:**

| | |
|---|---|
| CE | **Equipment complies with relevant EU Directives** |
| | **End of life disposal of this equipment should be in accordance with relevant EU Directives** |
| | **Caution - risk of electric shock** |
| | **Caution - risk of danger & refer to instructions** |
| | **Equipment protected by double or reinforced insulation (Class II)** |
| 3 ~ | **Three-phase alternating current** |

Thank you for buying one of our products. For safety and full understanding of its benefits please read this manual before use. Technical support is available from 01923 441717 and support@martindale-electric.co.uk.

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## 1. INTRODUCTION

### 1.1 Inspection

Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

### 1.2 Description

The PC15250 is designed to quickly and simply prove the presence of all three phases on a distribution system and indicate the phase sequence.

It is ideal for identifying worn or unmarked cables or ensuring motors etc. are wired with the correct phase sequence.
The retractable GS38 probe shields give a choice between longer exposed tips for reaching inaccessible contacts and safer, shorter lengths for increased safety.

### 1.3 Accessories (included)

◆ Instructions

## 2. PRODUCT SPECIFIC SAFETY INFORMATION

**Measurement Category IV (CAT IV)** is applicable to test and measuring equipment connected at the source of the building's low-voltage MAINS installation.

The specified measurement category means the phase sequence indicator will be safe to the user if inadvertently connected to a voltage up to 600V AC/DC to earth within a CAT IV environment. It **does not** mean it can be used to test for a voltage beyond its maximum specified limits.

### 2.1 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use.

**⚠ Warning**

The phase sequence indicator must only be used by a skilled and competent person who is familiar with the relevant regulations, the safety risks involved and the consequent normal safe working practices.

Before use check the unit for cracks or any other damage. The cables have black outer and contrasting inner insulation, to allow damage to the cables to be easily identified. If there is any doubt the unit should **not be used**.

Always verify the unit is functioning correctly on a known correctly sequenced 3-phase voltage source before and after use. **Do not use** the unit if the unit does not give the correct indications.

Always keep your fingers behind the test probe finger guards. Never touch the exposed metal probe tips.



The socket tester is not intended to determine if circuits being tested are dead. The correct testing methods should be used to do this.

If the LED indicators do not illuminate, this does not necessarily mean all three phases under test are dead. Two phases could be open circuit, but one phase could still be live.

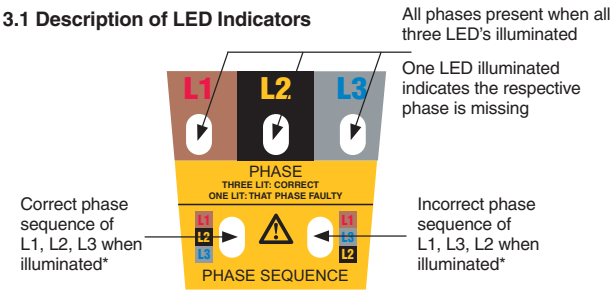
**⚠ Caution**

Avoid severe mechanical shock or vibration and extreme temperature.



## OPERATION

### 3.1 Description of LED Indicators




*Both phase sequence LED's are illuminated if a phase is missing.

### 3.2 Use of Test Probe Shrouds

The shrouds around the L1 and L2 test probes are normally sprung forwards to IP 2X rating and are retractable.

For optimum safety, the shrouds should be allowed to spring forward freely whenever the probe tips are removed from a location under test.

If desired, and before the unit is connected to any source of voltage, the shrouds can be locked back by pushing and twisting 90°.

The probe tips will be exposed by 3 ± 0.5mm. In this position they are GS38 compliant.

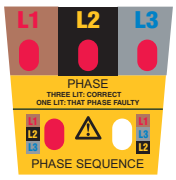
### 3.3 Proving Check

Before and after use, verify the unit is functioning correctly on a known correctly sequenced 3-phase voltage source of 50V to 600V phase to phase, and frequency of 40Hz to 60Hz.



Connect the L1, L2 and L3 test probes respectively to the L1, L2 and L3 phases of the voltage source.

The PC15250 must indicate as shown below.




L1, L2 & L3 LED's must illuminate red

Phase Sequence L1 L2 L3 LED must illuminate red

Phase Sequence LED L1 L3 L2 LED must be extinguished

**Do not use** the unit if the unit does not give the correct indications above.

During this verification emphasis should also be placed upon the flexing of the individual cables along their length, and particularly at the entry points to the hand held elements, to confirm that the cable/s have not fractured.

### 3.4 Testing a 3 Phase Distribution System

Take all required safety precautions when connecting the test probes to the 3-phase electrical distribution system to be tested.

1. The three test probes are marked L1, L2, L3. These relate to the L1, L2, L3 LED's on the instrument facia.

2. To determine phase presence and phase sequence, connect the test probes to the phase cables of the 3-phase electrical distribution system to be tested. Refer to table 2 of section 3.5 to determine to which cables to connect L1, L2 and L3 (see Note 2).

3. Turn on the power to the circuits being tested where necessary.

4. Refer to table 1 to determine the phase presence and the phase sequence of the wiring being tested.

If all phases are present then all phase LED's and the relevant phase sequence LED will illuminate. (see Note 3).

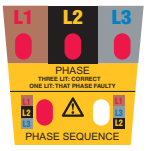
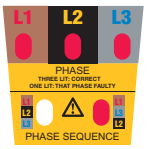
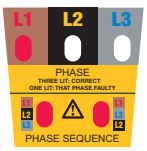
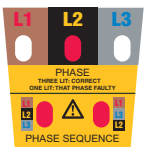
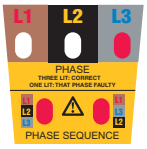
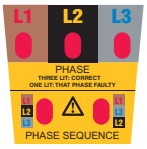
If a phase is missing then only the LED of the missing phase will illuminate. The phase sequence LED's should be ignored when a phase is missing.

**⚠ Warning**

Where a 3-phase distribution system is found to have a wiring error, maintenance should only be carried out by a competent electrician who is familiar with the relevant regulations, the safety risks involved and the consequent normal safe working practices.



Table 1

| | PC15250 Indication | Wiring Condition |
|---|---|---|
|   | L1, L2 & L3 LED's illuminate red. Phase Sequence L1L2L3 LED illuminates red. (See Note 1) | **All phases present. Phase sequence is L1, L2, L3.** |
|   | L1, L2 & L3 LED's illuminate red. Phase Sequence L1L3L2 LED illuminates red. (See Note 1) | **All phases present. Phase sequence is L1, L3, L2.** |
|   | L1 illuminates red. Ignore phase sequence LED's. | **Phase L1 is missing.** |
|   | L2 illuminates red. Ignore phase sequence LED's. | **Phase L2 is missing.** |
|   | L3 illuminates red. Ignore phase sequence LED's. | **Phase L3 is missing.** |
|   | All LED's illuminated red. | **Two test probes possibly connected to the same phase.** |



**Note:** Neutral and earth connections are not tested. The tests will not simulate your normal usage load.

**Note 1:** ⚠ If none of the LED's illuminate, this does not necessarily mean all three phases under test are dead. Two phases could be open circuit, but one phase could still be live.

**Note 2:** The colours of the cables under test cannot be relied upon to conform to the expected phases.

**Note 3:** This instrument only confirms the presence of live phases and the phase sequence in the location being tested. E.g. A phase marked as "L1" elsewhere in the fixed installation may not be the same phase as one marked as "L1" in the location being tested. That must be verified by separate tests to confirm absence of phase offset.

### 3.5 Wiring Colour Coding

In April 2004 the colour coding of UK wiring was harmonised with the IEC wiring colour code. Table 2 shows the old UK colour code and the new IEC colour code.

| | Earth | Neutral | Line 1 | Line 2 | Line 3 |
|---|---|---|---|---|---|
| **Old UK Colours** | Green/ Yellow | Black | Red | Yellow | Blue |
| **New IEC Colours** | Green/ Yellow | Blue | Brown | Black | Grey |



## 4. MAINTENANCE

### 4.1 Fuse Replacement

⚠ To avoid shock, injury or damage to the voltage indicator, disconnect it from any external circuits before proceeding.

⚠ Replace only with the fuse specified. Martindale order code: FUSE500 (pack of 3).

The PC15250 is fitted with three 600V 0.5A 50kA HRC rated fuses (6x32mm), one in each probe. They can be replaced by unscrewing the probes as show below.



### 4.2 Cleaning

The unit may be cleaned using a soft dry cloth. Do not use moisture, abrasives, solvents, or detergents, which can be conductive.

### 4.3 Repair & Service

There are no user serviceable parts in this unit other than those that may be described in section 4. Return to Martindale Electric if faulty. Our service department will quote promptly to repair any fault that occurs outside the guarantee period.
Before the unit is returned, please ensure that you have checked the unit and fuses.

### 4.4 Storage Conditions

The instrument should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

**5. WARRANTY AND LIMITATION OF LIABILITY**

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale.

Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

Nothing in this statement reduces your statutory rights.



MARTINDALE ELECTRIC

# Specification
# PC15250 Mk2
# Phase Sequence Indicator





**Electrical**
Input voltage range: 50V to 600V AC (Phase to Phase)
Input frequency: 40 to 60Hz
Input current: < 3mA

**Environmental**
Temperature (Operating & Storage): -10°C to 55°C
Humidity (Operating & Storage): ≤ 85% R.H
Altitude: up to 2000m
Pollution Degree: 2

**General**
Power: from circuit under test
Fuses: 600V 0.5A 50kA HRC rated fuses (6x32mm) x 3, one in each probe
Dimensions: 116(L) x 69(W) x 25(D) mm
Weight packed: 361g approx
Includes: instructions

**Safety**
Conforms to GS38 & BS EN61557-7, CAT IV 600V
Class II, Double Insulation

**EMC**
Conforms to BS EN61326-2-2

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- Accessories
- Calibration Equipment
- Continuity Testers
- Electricians' Kits
- Environmental Products
- Full Calibration & Repair Service
- Fuse Finders
- Digital Clamp Meters
- Digital Multimeters
- Labels
- Microwave Leakage Detectors
- Motor Maintenance Equipment
- Multifunction Testers
- Non-trip Loop Testers
- Pat Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrohm Testers (4 & 5kV)
- Specialist Drummond Testers

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