

TEK200 VOLTAGE/ MAGNETIC INDICATOR



INSTRUCTION MANUAL

MARTINDALE
ELECTRIC



ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING

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. SAFETY INFORMATION: Always read before proceeding.




REMEMBER: SAFETY IS NO ACCIDENT

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.

Particular attention should be paid to the Warnings, Precautions and Technical Specifications.



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

1.1 Meaning of Symbols and Markings

-  Caution - risk of danger & refer to instructions
-  Caution - risk of electric shock
-  Equipment protected by double or reinforced insulation (Class II)

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

For further information on measurement categories see page 18 or visit www.martindale-electric.co.uk/measurement_categories.php

-  Equipment complies with relevant EU Directives
-  End of life disposal of this equipment should be in accordance with relevant EU Directives

1.2 Precautions

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

Warnings

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.

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

The TEK200 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, and is capable of interpreting the results under the conditions and for the purposes for which it has been constructed and specified.

Before each use the unit should be examined for damage, cracks, cuts or scratches. If there is any doubt the voltage indicator should **not be used**.

Make sure the unit is dry, clean and free from dust, grease and moisture while in use to avoid the danger from electric shock due to surface leakage.

Before and after each use, the TEK200 must be proven using a suitable proving device or a known good voltage source. **Do not use** the TEK200 if any expected indication LED's fail to illuminate correctly during proving.

Testing for a voltage that exceeds the specified limits of the TEK200 may damage the unit and expose the operator to a shock hazard. Always check the TEK200's specified limits before use.

The TEK200 must only be used on CAT IV, CAT III and CAT II installations up to 600V to earth, and within the operating temperature and humidity range specified.

Do not use the TEK200 if the battery casing is not fitted.

Always keep your fingers behind the finger guard.

The TEK200 will not detect DC voltage.

Do not use the TEK200 during rain or precipitation.

The TEK200 must not be dismantled or modified in any way by unauthorized persons. The safety of the voltage indicator cannot be guaranteed under such circumstances and **must not be used**.

Cautions

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from a leaking battery, remove the battery when the unit is not in use for an extended period.

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2. INTRODUCTION

2.1 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.

2.2 Description

The TEK200 is a non-contact voltage and magnetic field indicator.

The non-contact voltage indicator is suitable for detecting the presence of voltage in the range of 100V to 600V.

The magnetic field indicator is suitable for detecting the presence of the magnetic fields produced by solenoids, relays, inductors, transformers, etc. It will also indicate the polarity of permanent magnets, solenoids, etc.

A self-test circuit checks the functionality and battery of the TEK200.

2.3 Battery Installation

Refer to Section 4.1 (Battery Replacement) for the battery installation instructions for the TEK200.

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3. OPERATION

3.1 Self Test

The self test checks the functionality and battery, a proving check should always be performed prior to use.

Set the TEK200 **OFF/VAC/MAG** switch to **VAC**, press the **PROVE** button and check for the following:

- ◆ The **N** and **S** LED's are flashing;
- ◆ There is an audible tone.

Set the TEK200 **OFF/VAC/MAG** switch to **MAG**, press the **PROVE** button and check for the following:

- ◆ The **N** and **S** LED's are continuously illuminated;
- ◆ There is an audible tone.

Do not use the TEK200 if either LED fails to illuminate or the buzzer fails to sound.

If both LED's and the buzzer do not function, replace the battery (see section 4.1 Battery Replacement) and retest the unit.

3.2 Proving Check

Before and after use, verify the TEK200 is functioning correctly on a known good voltage source.

Do not use the TEK200 if either of the LED's fails to illuminate or the buzzer fails to sound during proving.

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Warning

If the voltage source exceeds the specified limits of the TEK200 the unit may be damaged and the operator exposed to a shock hazard. Always check the voltage magnitude of the voltage source before proceeding with a proving check.

3.3 Testing for the Presence of Voltage

Warnings

Non-contact voltage indicators are not suitable to determine if a circuit is not hazardous live. A double pole voltage test should always be used for that purpose.

Grip the TEK200 fully and firmly around the hand grip to obtain optimum and consistent sensitivity. A loose grip during testing may reduce the unit's sensitivity.

Set the **OFF/VAC/MAG** switch to **VAC**.

Taking all necessary safety precautions and referring to section 3.4, apply the TEK200 probe tip to the cable or area you wish to test for voltage.

When an AC voltage is detected the **N** and **S** LED's will flash and the buzzer will sound.

Switch the TEK200 off when not in use to conserve battery power.

3.4 Voltage Testing Considerations

From some directions the neutral and earth conductors in cables will shield the live, so it is important that a cable is probed from all directions.

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When testing for the presence of voltage in multi-core cables always run the probe tip of the TEK200 along a short length of cable so as to overcome the natural twist in conductors.

⚠ Be aware that if the presence of AC voltage is not indicated, voltage could still be present. The unit indicates active voltages in the presence of electrostatic fields. If the field strength is low the unit may not indicate. This could be due to factors such as:

- ◆ Low mains voltage (<100V AC)
- ◆ Shielded wire/cables
- ◆ Thickness and types of insulation
- ◆ Distance from the voltage source
- ◆ Low battery

If testing at locations with high background noise levels, always determine whether the buzzer is perceptible before relying solely on the buzzer indication.

3.5 Magnetic Field Basics

A magnet field can be considered to be made up of invisible lines of magnetic flux that “flow” in a defined direction. The accepted convention is that magnetic flux flows from the north pole of a magnet to the south pole of a magnet. The polarity of a magnet, therefore, is defined by the polarity of this magnetic flux.

The north pole of a bar magnet is the end which tries to point to the North Pole of the Earth, (the correct full name for the north pole of a bar magnet is “North-seeking pole”). This accepted convention became established by early explorers who used naturally-occurring magnetic lodestones to point towards North.

By definition, therefore, the North Pole of the Earth is actually a south-polarity magnet, since opposite poles attract and like poles repel. The follow-on from this fact is the realisation that a compass needle is attracted to point towards the south pole of any other magnet and NOT the north pole of any other magnet.

Lines of magnetic flux normally try to adopt the shortest possible path. However, the directions that these lines exit initially from the north pole and enter finally into the south pole are strongly influenced to lie along the axis of the magnet. The lines of flux must form broadly circular or elliptical loops as they reach around from north to south.

3.6 Magnetic Field Sensing

Hold the TEK200 around the hand grip and set the **OFF/VAC/MAG** switch to **MAG**.

The magnetic field sensing element of the TEK200 is within the probe tip.

Taking all necessary safety precautions and referring to section 3.7, position the TEK200 probe tip within proximity of the magnetic field to be tested.

The polarity of the field will be indicated by the illumination of the LED's as follows:

N When illuminated indicates North pole

S When illuminated indicates South pole

In the presence of an alternating electro-magnetic field both north and south pole indicators will illuminate.

The audible tone will sound in the presence of unipolar and bipolar magnetic or electro-magnetic fields.

Switch the TEK200 off when not in use to conserve battery power.

3.7 Magnetic Field Sensing Considerations

The sensing element reacts to lines of flux entering the back (underside) of the tip and exiting from the front (topside) of the tip, as shown in figure 1.

The magnet should be placed in relation to the tip of the TEK200 to best achieve the arrangement of flux lines as in figure 1.

The polarity indicated on the front of the TEK200 will be according to the example situations shown in figures 2 to 5.

Take particular note of the examples shown in figures 4 and 5 where the polarity indicated may be misleading.

FIGURE 1

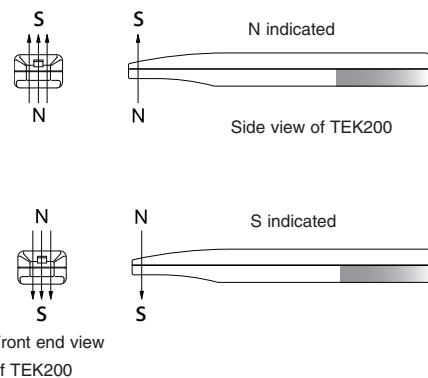
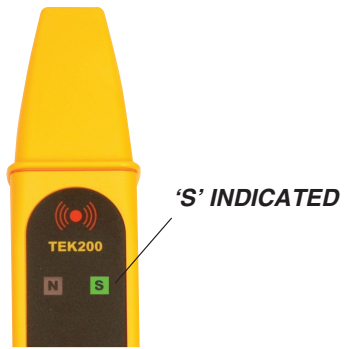
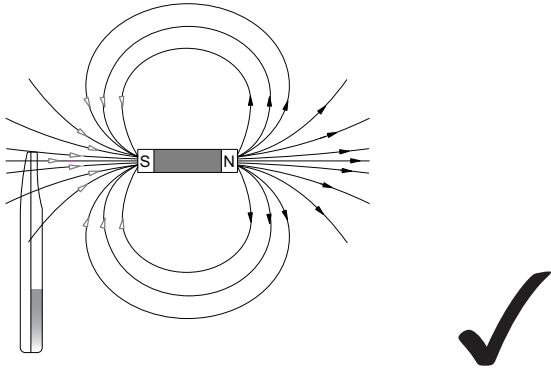


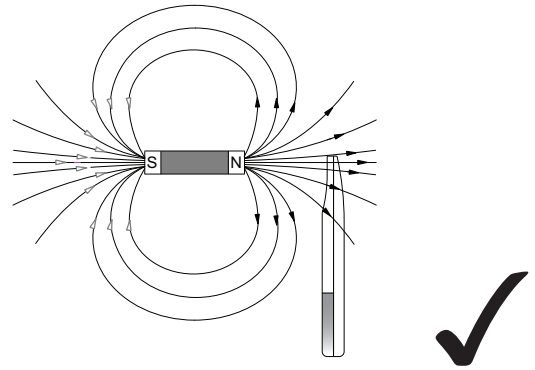
FIGURE 2 CORRECT ORIENTATION



CERTAIN RESULT

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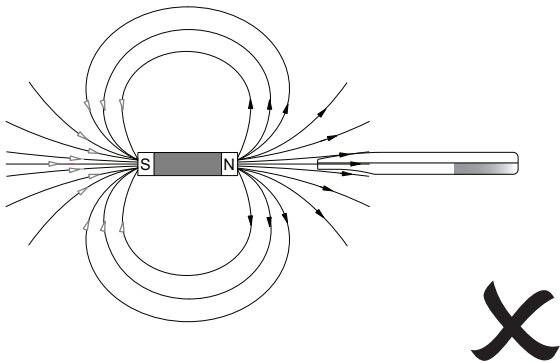
FIGURE 3 CORRECT ORIENTATION



CERTAIN RESULT

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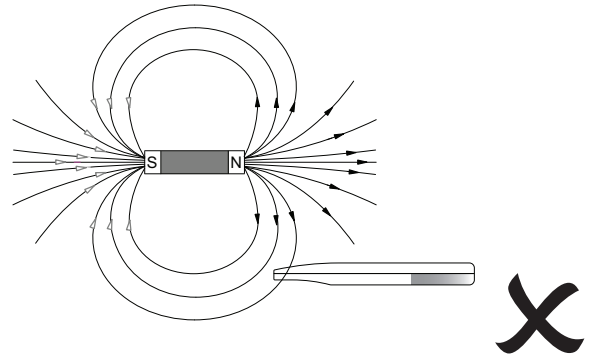
FIGURE 4 INCORRECT ORIENTATION



UNCERTAIN RESULT

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FIGURE 5 INCORRECT ORIENTATION



MISLEADING RESULT

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4. MAINTENANCE

4.1 Battery Replacement

⚠ To avoid shock or injury, remove the TEK200 from the vicinity of any external circuits before proceeding.

To gain access to the battery compartment, undo the screw securing the battery compartment cover and lift off the cover.

Fit a new 9V, PP3 alkaline battery (IEC 6LR61, NEDA 1604A).

Replace the battery cover and the screw.

4.2 Cleaning

⚠ To reduce the risk of surface leakage, this instrument must be kept in a clean condition.

Prior to cleaning, remove the TEK200 from the vicinity of any external circuits before proceeding.

If contamination is found, clean with a damp soft cloth and if necessary a mild detergent or alcohol. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

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.

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Before the unit is returned, please ensure that you have checked the unit and battery.

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.

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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.

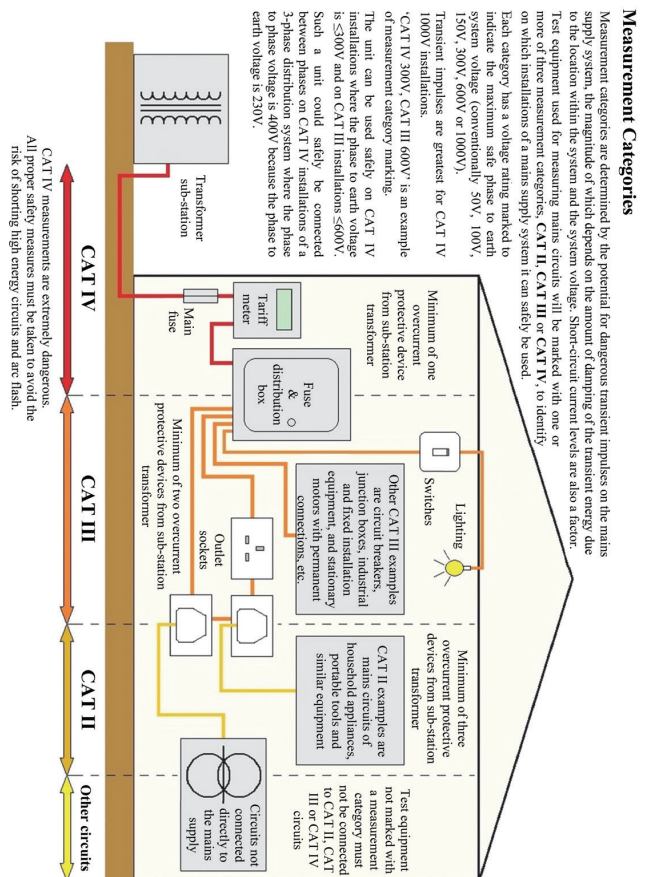
Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

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.

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Specification
TEK200 Non-contact Voltage
& Magnetic Indicator



Electrical

Voltage range: 100V to 600V AC rms
Frequency range: 45Hz to 1kHz
Voltage sensitivity: see table 1

Table 1. Typical Sensing Distances for Energised Cables at 50 Hz

Cable Type	at 115V	at 230V
Flat 1mm ² Twin & Earth	3mm	23mm
Flat 2.5mm ² Twin & Earth	5mm	23mm
Round 1.5mm ²	2mm	18mm

Magnetic

Magnetic sensitivity: 10mT
Frequency range: 0Hz to 30kHz

Environmental

Temperature (Operating & Storage): -10°C to 40°C.
Humidity (Operating & Storage): ≤ 85% R.H.
Altitude: up to 2000m
Pollution degree: 2



Specification
TEK200 Non-contact Voltage
& Magnetic Indicator

General

Power: 9V, PP3 alkaline battery (IEC 6LR61, NEDA 1604A)
Current consumption: 34mA max.
Dimensions: 205 x 36 x 25 mm
Weight 120g approx. (battery included)
Includes: 9V PP3 battery, instructions

Safety

Conforms to BS EN61010-1 CAT IV 600V
Class II, double insulation

EMC

Conforms to BS EN61326-1

Check out what else you can get from Martindale:

- 18th Edition Testers
- 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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