MTL10 & MTL20 TEST LAMPS

Instruction Manual

MARTINDALE ELECTRIC

Keeping You Safe

DRUMMOND

⚠ 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 +44 (0)1923 441717 and support@martindale-electric.co.uk.

CONTENTS

1. Description

The MTL10 and MTL20 test lamps are two-pole voltage indicators / detectors for universal applications. They are designed to be used by skilled persons in accordance with safe methods of work, and are constructed in accordance with the applicable safety standards to provide safe and reliable indication.

The MTL10 and MTL20 have the following features:

- AC and DC Voltage tests up to 500V AC and 750V DC
- Bright LED indication
- Full voltage indication function without batteries
- PTC thermistor fitted in probe to limit current in the event of cable damage
- Contrasting colour of inner sheath to highlight cable damage
- Ergonomic and robust housing
- Probe tips comply with GS38
- Measurement Category CAT IV 600V
- Constructed in compliance with BS EN 61243-3:2010
- IP64 rated environmental protection for internal electronics

2. SAFETY INFORMATION

⚠ 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

2.1 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)**
⚠	**Suitable for live working**
~	**Alternating current (AC)**
⎓	**Direct current (DC)**
⏻	**ON/OFF (push button)**

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 refer to page 15 or visit www.martindale-electric.co.uk/measurement_categories.php

CE **Equipment complies with relevant EU Directives**

UK CA **Equipment complies with relevant UK Conformity Assessed marking**

End of life disposal of this equipment should be in accordance with relevant Directives

ELV **Extra low voltage. Voltage below 50V AC or 120V DC**

2.2 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 the use of protective gloves, goggles etc. should be employed.

The voltage 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 each use the voltage indicator should be examined for damage, cracks, cuts or scratches to the housing, cable and prods. The cable has black outer and contrasting inner insulation, to allow damage to the cable to be easily identified. If there is any doubt the voltage indicator should **not be used**.

Make sure the voltage indicator 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 voltage indicator must be proven using a suitable proving device or a known good voltage source. **Do not use** the voltage indicator if any expected LED's fail to illuminate correctly during proving.

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

The specified measurement category means the voltage indicator will be safe to the user if connected to a voltage up to 1000V to earth on a CAT II or CAT III installation and 600V to earth on a CAT IV installation. It **does not** mean it can be used to test for a voltage beyond its maximum specified limits.

If using the voltage indicator in falling rain or damp conditions, the operator must use additional protection to avoid the danger from electric shock due to surface leakage.

Select appropriate test prods and secure with captive ring nuts. The L-shaped test prods should be oriented in one of four directions using the square location feature before it is secured.

When changing or adjusting the prods, ensure that both prods have been disconnected from any source of power or other equipment.

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

The different indicating signals of the voltage indicator (including the ELV limit indication) are not to be used for measuring purposes.

The voltage indicator 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 it **must not be used**.

⚠ Cautions

Avoid severe mechanical shock or vibration and extreme temperature.

If the voltage indicator has been stored or transported in temperatures outside its normal operating range it should be given sufficient time to stabilise in the environment where it is to be used. An acclimatisation time of at least 2 hours is required prior to operation of the voltage indicator.

2.3 Safety Advice

Depending on the internal impedance of the voltage indicator there will be a different capability of indicating the presence or absence of operating voltage in case of the presence of interference phantom voltage.

A voltage indicator of relatively low internal impedance, compared to the reference value of 100 kΩ, will not indicate all interference voltages having an original voltage value above the ELV level. When in contact with the parts to be tested, the voltage indicator may discharge temporarily the interference voltage to a level below the ELV, but it will be back to the original value when the voltage detector is removed.

When an indication of voltage present does not appear, it is highly recommended installing earthing equipment before work.

A voltage indicator of relatively high internal impedance, compared to the reference value of 100 kΩ, may not permit to clearly indicate the absence of operating voltage in case of the presence of interference voltage.

When an indication of voltage present appears on a part that is expected to be disconnected from the installation, it is highly recommended confirming by another means (e.g. use of an adequate voltage indicator, visual check of the disconnecting point of the electric circuit, etc.) that there is no operating voltage on the part to be tested and to conclude that the voltage indicated by the voltage indicator is an interference voltage.

A voltage indicator declaring two values of internal impedance has passed a performance test of managing interference voltages and is (within technical limits) able to distinguish operating voltage from interference voltage and has a means to directly or indirectly indicate which type of voltage is present.

3. INTRODUCTION

3.1 Inspection

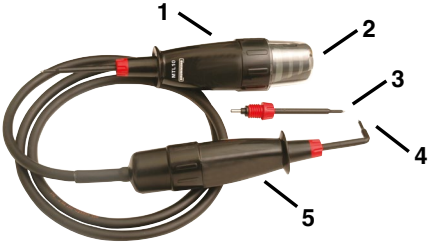
Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

3.2 Accessories

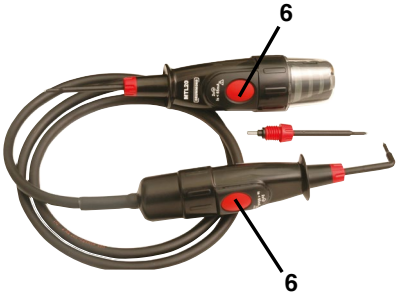
- 2pc. Straight prod
- 1pc. L-shaped prod
- Instructions

4. OPERATION

4.1 Control Elements and Connections



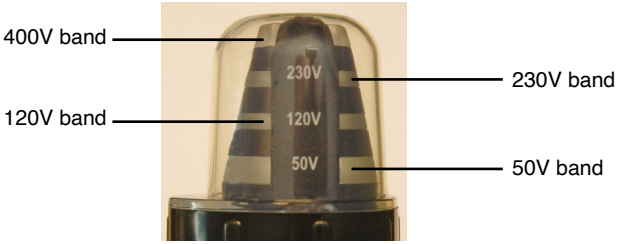
MTL10



MTL20

1 - Instrument body
2 - LED indicator bands
3 - Straight prod
4 - L shaped prod
5 - Probe handle
6 - Switches (MTL20 only)

4.2 Description of LED Indicators



The magnitude of a voltage is indicated by the illumination of LED's in four separate bands around the top of the instrument body.

The nominal voltage thresholds of the indicator LED bands are 50V, 120V, 230V and 400V and are marked next to the relevant band.

The indicator LED bands will illuminate when the magnitude of the voltage source is at a value approaching or greater than the corresponding marked voltage. For example if the voltage source is 55V AC rms then only the 50V indicator LED band will illuminate, if 450V AC rms all four indicator LED bands will illuminate.

Note: The individual LED indications are not to be used for measuring purposes.

4.3 Operating Duty Ratio

The voltage indicator should be operated (ON) for a maximum period of 30 seconds. This should be followed by a recovery period (OFF) of 4 minutes.

The operating duty ratio is 8 to 1, so if the voltage indicator is only ON for 2 seconds then the OFF period need only be 16 seconds.

4.4 Proving Check

Before each use the voltage indicator should be examined for damage, cracks, cuts or scratches to the housing, cable and prods. The cable has black outer and contrasting inner insulation, to allow damage to the cable to be easily identified. If there is any doubt the voltage indicator should **not be used.**

Before and after use, verify the voltage indicator is functioning correctly with a proving device (PD440S is recommended), or a known good voltage source. **Do not use** the voltage indicator if any expected LED's fail to illuminate correctly during proving.

⚠ Warning

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

The LED bands that illuminate during proving will depend on the magnitude of the proving unit output or the voltage source.
For example if the voltage source is 230V AC rms then all LED bands except the 400V LED band must illuminate. If a PD440 is used then all LED bands must illuminate.

During this verification emphasis should also be place upon the flexing of the voltage indicators cable along its length, and particularly at the entry points to the hand held elements, to confirm that the cable has not been fractured.

If using a PD440S for proving, the press button switches on the MTL20 can also be functionally checked. In this case when both buttons are pressed simultaneously the 400V LED band will cease to illuminate, indicating that the added load of the MTL20 has caused the output voltage of the PD unit to drop, thereby proving the functionality of the switches and loading circuit.

Any unexpected display should be investigated and the voltage detector not used until all expected LED's illuminate.

4.5 Testing for the Presence of Hazardous Live Voltage

⚠ Warning

Hold the unit and test leads behind the finger guards in a manner that will not obscure the voltage band indication LED's. Never touch the exposed metal test prods or any part of the instrument forward of the finger guards while applied to hazardous voltages
While taking all required safety precautions connect the test prods across the test points where a voltage difference may be present.

The voltage level of any voltage present between the test points will be indicated by the illumination of the relevant voltage indicator LED bands.

3.6 Push Button Switches (MTL20 only)

The purpose of the push button switches on the MTL20 is to provide additional load to the circuit under test where the presence of interference (phantom) voltage may be suspected (see section 3.7).

Simultaneous depression of both switches (one on the probe handle and one on the instrument body) introduces a load of approximately 8.8kΩ to the circuit being tested.

Note: Interference (phantom) voltages can rise again after the push buttons are released. If a voltage indication re-appears on the LED bands while the buttons are not pressed, there may be a hazardous voltage that must be treated with caution.

4.7 Interference (Phantom) Voltage

It is possible for wiring that is ‘dead’ to indicate the apparent presence of voltage at power frequency.

If wiring that is live is running in close proximity to the ‘dead’ wiring being tested, there can be capacitive or inductive coupling between the two, thereby causing interference (phantom) voltage.

⚠ Refer to section 2.3 for safety advice relevant to interference voltage.

5. MAINTENANCE

5.1 Probe Replacement

If the test prods become damaged they should be replaced. Replacement prods are available as spare items:

- AC
- Straight prod (DRUMTL2104)
- L-shaped prod (DRUMTL2105)

Contact your local distributor or contact Martindale Electric on 01923 441717 or email sales@martindale-electric.co.uk.

5.2 Periodic Testing

To maintain the integrity of the voltage indicator, Martindale Electric recommends that it is returned at least once a year to verify physical integrity, electrical specification and insulation integrity.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.
Email: service@martindale-electric.co.uk Tel: +44 (0)1923 650660

5.3 Cleaning

⚠ Warning

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

Prior to cleaning, ensure that the instrument is disconnected from any voltage source.

Wipe the voltage indicator with a cloth soaked with alcohol or mild non-conductive detergent. Particular attention should be paid to all areas forward of the finger guards. Do not use abrasives, abrasive solvents or detergents which can cause damage to the voltage

detector. Allow the voltage indicator to thoroughly dry before use. 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.

5.4 Repair and Service

There are no serviceable parts in this unit. The MTL10 and MTL20 are sealed units and **must not** be opened for any reason.

5.5 Storage Conditions

The instrument should be kept in cool, dry conditions and not subjected to shock, scratching or other damage, prolonged direct harsh sunlight, extremes of temperature 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.

6. 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.

MEASUREMENT CATEGORIES

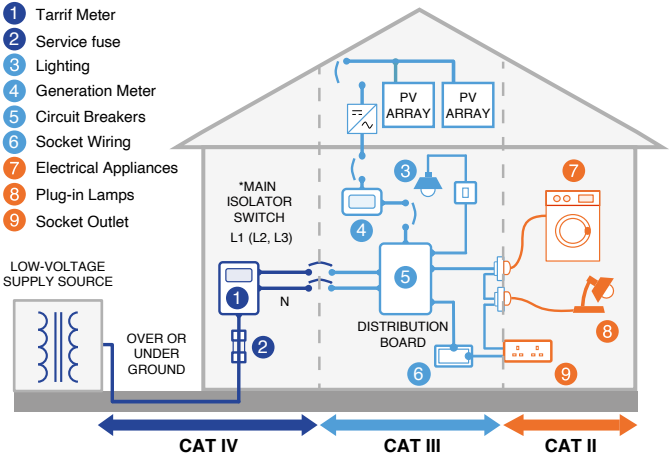
CAT Ratings
BS EN61010-1 Installation Categories (CAT ratings) define the risks from hazardous transient impulses and potentially lethal short circuit currents on the mains supply system based on where you are working.

Voltage Ratings
Test equipment used for measuring mains circuits will have a CAT rating to show where it can be used. Each category also has a voltage rating to show the maximum safe phase to earth system voltage, normally 50V, 100V, 150V, 300V, 600V or 1000V.

Stay safe - Match your test equipment safety rating to the installation category.

CAT II: Socket outlets and similar points of the mains installation.
CAT III: The distribution part of the building's mains installation.
CAT IV: The supply side source of the building's mains installation.

Testers, leads and accessories all need safety ratings equivalent to, or higher than the installation category and voltage rating for the location to be safe.



DRUMMOND

Specification
MTL10 & MTL20 Mk2
Test Lamps

Electrical

Maximum working voltage: 500V AC, 750V DC
Nominal voltage threshold indications: 50, 120, 230, 400V AC/DC
Nominal voltage threshold tolerance: Conforms to BS EN 61243-3:2010
Internal impedance at ELV a.c.: 30kΩ (MTL10)
30kΩ / 8.8kΩ (MTL20)
Range detection: Automatic
Response time: <0.1s
Frequency range: DC, 40-65Hz
Switchable load (MTL20 only): approx. 8.8kΩ load
Test current:
MTL10 & MTL20 (switches not operated): <3.5mA at 500V AC rms, 750V DC
MTL20 (switches operated):
approx. 28mA at 230V AC rms, DC
approx. 60mA at 500V AC rms, DC
Duty ratio: 30s ON (operated) / 240s OFF (recovery)

DRUMMOND

Specification MTL10 & MTL20 Mk2 Test Lamps

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
Dimensions: 213(L) x 112(W) x 72(D) mm.
Weight packed:
MTL10 – 320g approx.
MTL20 – 350g approx.

Includes: 2pc. Straight prod, 1pc. L-shaped prod, instructions

Safety
Conforms to BS EN 61243-3:2010 CAT IV 600V
Class II, double insulation.
IP rating: IP64
Probe tips comply with GS38

EMC
Conforms to BS EN 61326-1.

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
- Safe Isolation Kits
- Multifunction Testers
- Non-trip Loop Testers
- Pat Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrohm Tester
- Specialist Drummond Testers

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