

# VT25 / VT28 VOLTAGE TESTER

## Instruction Manual

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**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

### **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](http://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)**

 **Suitable for live working**

**CAT II (Measurement Category II)** is applicable to test and measuring equipment connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.

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

**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 visit [www.martindale-electric.co.uk/measurement\\_categories.php](http://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 the use of protective gloves, goggles etc. should be employed.

The voltage tester 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 tester 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 tester should **not be used**.

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

Testing for a voltage that exceeds the specified limits of the voltage tester 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 voltage tester must only be used in low voltage systems of CAT IV up to 600V, of CAT III and CAT II up to 690V, and within the operating temperature and humidity range specified.

The specified measurement category means the voltage tester will be safe to the user if inadvertently connected to a voltage up to

1000V AC/DC to earth on a CAT III or CAT II installation and 600V AC/DC 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 the probe tip shrouds are not fitted, great care must be taken when testing CAT III and CAT IV installations to avoid the risk of shorting high energy circuits and arc flash.

**Do not** use the voltage tester in damp conditions.

**Do not** use the voltage indicator if the battery casing is not fitted.

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

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

The voltage tester must not be dismantled or modified in any way by unauthorized persons. The safety of the voltage tester 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 tester 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 tester.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged, or when the unit is not in use for an extended period.

### **1.3 Safety Advice**

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

A voltage tester of relatively low internal impedance, compared to the reference value of 100 k $\Omega$ , 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 tester may discharge temporarily the interference voltage to a level below the ELV, but it will be back to the original value when the voltage tester is removed.

When the indication “voltage present” does not appear, it is highly recommended installing earthing equipment before work.

A voltage tester of relatively high internal impedance, compared to the reference value of 100 k $\Omega$ , may not permit to clearly indicate the absence of operating voltage in case of the presence of interference voltage.

When the indication “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 tester, 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 tester is an interference voltage.

A voltage tester 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.

## **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 VT25 and VT28 are voltage testers used for proving circuits are dead i.e. not hazardous live. They are constructed in accordance with the latest safety standards. The voltage testers have the following features:

- ◆ AC and DC Voltage testing up to 690V
- ◆ LCD indication of AC and DC voltage (VT28 only)
- ◆ Continuity test with optical and acoustical indication up to 500k $\Omega$
- ◆ Single pole phase test
- ◆ Phase rotation test
- ◆ Auto-power On/Off
- ◆ Automatic AC/DC detection
- ◆ Bright LED indication
- ◆ Indication of voltage above the ELV level when batteries flat
- ◆ Ergonomic and robust housing
- ◆ Probe-tip protection
- ◆ Torch
- ◆ Complies with BS EN 61243-3:2014
- ◆ Complies with GS38 when probe tip covers are fitted
- ◆ Measurement Category CAT IV 600V, CAT III 1000V

### **2.3 Accessories**

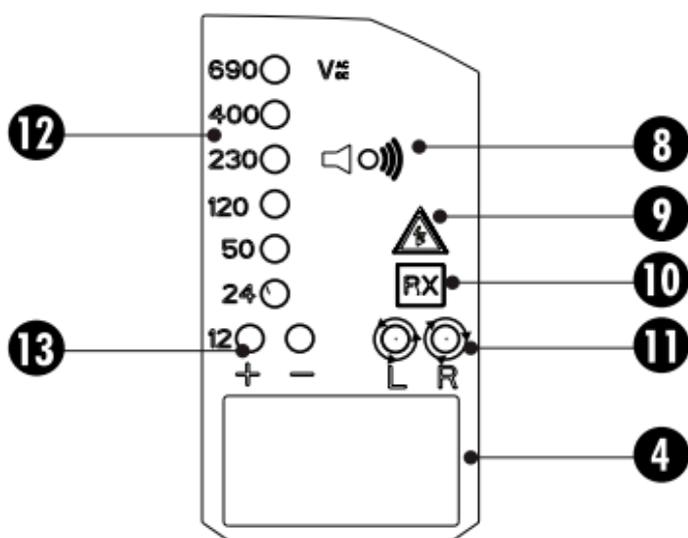
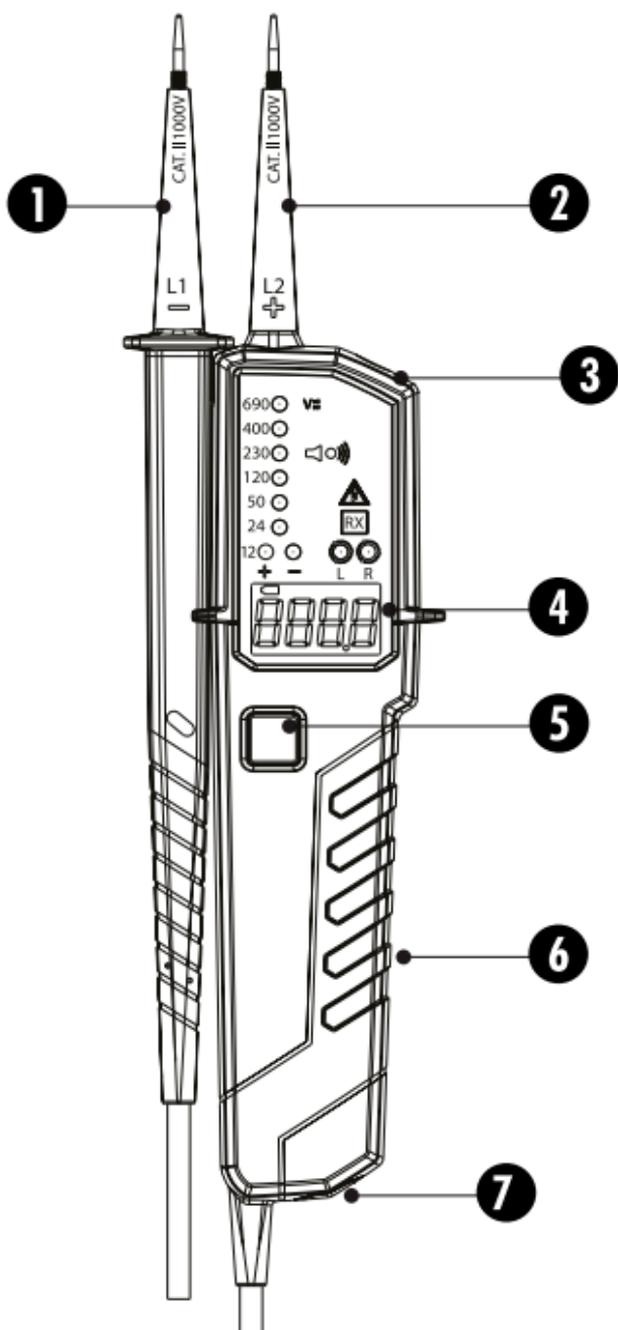
- ◆ Probe tip covers (fitted)
- ◆ 2 x 1.5V AAA alkaline batteries
- ◆ Instructions

### **2.4 Battery Installation**

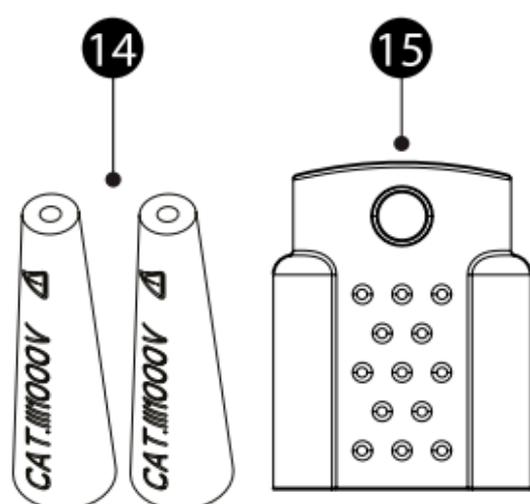
Refer to Section 4.1 (Battery Replacement) for battery installation instructions.

### 3. OPERATION

#### 3.1 Description of VT25/VT28 Elements and LED Indicators



- 1 Test probe L1
- 2 Test probe L2
- 3 Torch
- 4 Digital Voltmeter LCD (VT28 only)
- 5 Torch button
- 6 Main body
- 7 Battery compartment
- 8 Buzzer
- 9 ELV warning and single pole test indicator
- 10 Continuity indicator
- 11 Phase rotation indicators
- 12 Voltage threshold indicators
- 13 12V and polarity indicators



- 14 Removable probe tip covers
- 15 Probe tip protective cover

### Polarity indicators

When connected to a DC voltage source either the + or – polarity LED's 13 will illuminate dependant on polarity. The positive probe 2 is on the main body and is marked with L2 and +.

When connected to an AC voltage source both the + and – polarity LED's will illuminate.

The polarity LED's will illuminate when the voltage source is  $\geq 12V$  AC rms or DC.

### Voltage threshold indicators

The voltage threshold LED's 12 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 the 24V and 50V LED's will illuminate, if 690V AC rms all voltage threshold LED's from 24V to 690V will illuminate.

### ELV warning and single pole test indicator

If the batteries are low or exhausted a hazardous live voltage will not be indicated by the polarity or voltage threshold LED's, but an indication of a voltage above the ELV limit (50V) will continue to be indicated by the ELV LED 9.

The ELV LED also indicates the presence of AC voltage when the unit is used as a single pole phase detector.

### Continuity indicator

The continuity RX LED 10 will illuminate to indicate continuity of a circuit under test.

## Buzzer

The buzzer will sound when:

- Voltage above the ELV threshold (50V) is present,
- or AC voltage is detected when used as a single pole phase tester,
- or circuit continuity is detected.

## 3.2 Auto-power On/Off

The voltage tester automatically powers on when it detects continuity, AC or DC voltage >10V approx. or a live phase on probe L2 (single pole test).

The voltage tester will automatically power off 5 seconds after ceasing to detect voltage or continuity.

## 3.3 Torch

Pressing the torch button **5** will turn on the torch and power up the voltage tester.

The torch will automatically power off after 10 seconds.

## 3.4 Low Battery Check

Before and after each use short the test probes of the voltage tester together.

On the VT25, check for an audible tone and a bright RX LED **10** indication.

If there is no audible tone or the RX LED is faint the batteries need to be replaced (see section 4.1 Battery Replacement).

On the VT28 if the batteries need replacing **14** will be displayed in the top left corner of the LCD.

**Do not** use the unit if the batteries need replacing.

## 3.5 Removable Probe Tip Covers

The probes are fitted with removable probe tip covers **14** allowing the probes to comply with GS38.

Where access to test points may require extended probe tips, the probe tip covers may be removed.

Where possible is advisable to keep these shrouds fitted. If removed, great care must be taken when using the voltage tester on CAT III and CAT IV installations to avoid the risk of shorting high energy circuits and arc flash.

### 3.6 Operating Duty Ratio

The voltage tester 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 tester is only ON for 2 seconds then the OFF period need only be 16 seconds.

### 3.7 Proving Check

Before each use the voltage tester 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 tester should **not be used**.

Before and after use, verify the voltage tester is functioning correctly with a proving device (PD690, PD700 or PD710 is recommended), or a known good voltage source. **Do not use** the voltage tester if any expected voltage indication LED's fail to illuminate correctly during proving.

The LED's that illuminate during proving will depend on the magnitude of the proving unit output or the voltage source. See table 1.

Also check the buzzer sounds during proving.

**Table 1.**

| VT25/<br>VT28<br>LED's  | Voltage<br>source<br>230V 50Hz | Proving unit type |                |                    |
|---|--------------------------------|-------------------|----------------|--------------------|
|   |                                | PD430<br>PD440    | PD690<br>PD700 | PD710              |
| RX  | Off                            | Off               | Off            | Off                |
| ELV  | On                             | On                | On             | On                 |
| +12V  | On                             | On                | On             | Only +<br>or - On* |
| -12V  | On                             | On                | On             |                    |
| 24V   | On                             | On                | On             | On                 |
| 50V   | On                             | On                | On             | On                 |
| 120V  | On                             | On                | On             | On                 |
| 230V  | On                             | On                | On             | On                 |
| 400V  | Off                            | On                | On             | On                 |
| 690V  | Off                            | Off               | On             | On                 |

\*Illumination of the 12V polarity LED's depends on the polarity of the connections to the PD710. Always reverse the connections to the PD710 to check the other 12V LED.

If only the ELV LED illuminates during proving then check the batteries.

 **Warning**

If the proving device or voltage source exceeds the specified limits of the voltage tester the voltage tester may be damaged and the operator 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.

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

### **3.8 Testing for the Presence of Hazardous Live Voltage**

 **Warning**

Hold the voltage tester and test prod behind the finger guards in a manner that will not obscure the voltage indication LED's. Never touch the exposed metal test prods or any part of the voltage tester forward of the finger guards while applied to hazardous voltages.

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

While taking all required safety precautions connect both test probes to the UUT (Unit or location under test).

The polarity and voltage level of any voltage present will be indicated by the illumination of the voltage tester LED's (see section 3.1).

The buzzer will also sound if voltage is present.

**Note:** The individual LED indications, including the ELV LED, are not to be used for measuring purposes.

### 3.9 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 1.3 for safety advice relevant to interference voltage.

### 3.10 Single Pole Phase Test

 **Warning**

Single pole phase testing is not suitable to determine if a circuit is not hazardous live. A double pole voltage test should always be used for that purpose.

While taking all required safety precautions connect the positive test probe **2** to the UUT (Unit or location under test).

The phase indicator LED **9** will illuminate and the buzzer will sound if the presence of AC voltage >100V is detected.

### 3.11 Phase Rotation Test

While taking all required safety precautions connect the test probes **L1** and **L2** to the phases to be tested.

The phase to phase voltage will be indicated by the voltage threshold LED's **12** or for the VT28 also by the LCD **4** .

The direction of the phase rotation will be indicated by one of the green phase rotation LED's **11** marked **L** (left rotation) and **R** (right rotation).

**Note:** The method of phase sequence detection relies on capacitive coupling to earth through the user. If the insulation/grounding conditions of the installation under test or user are not satisfactory then the test results may be impaired.

### 3.12 Testing for Continuity

While taking all required safety precautions firmly connect both test prods to the UUT (Unit or location under test).

The continuity indicator RX LED ⑩ will illuminate and the buzzer will sound to indicate circuit continuity.

Do not rely solely on the buzzer as an indication of continuity. Always check the voltage threshold LED indications as the buzzer also sounds to indicate the presence of voltage.

### 3.13 Digital Voltmeter LCD (VT28 only)

While taking all required safety precautions connect both test probes to the UUT (Unit or location under test).

Read the measured AC or DC voltage from the LCD ④ .

## 4. MAINTENANCE

### 4.1 Battery Replacement



To avoid shock or injury, disconnect the voltage tester from any external circuits before proceeding.

(Use diagram to the right as reference for battery replacement.)

To gain access to the battery compartment, use a coin or flat blade screwdriver to turn the battery door anti-clockwise until the dots align.

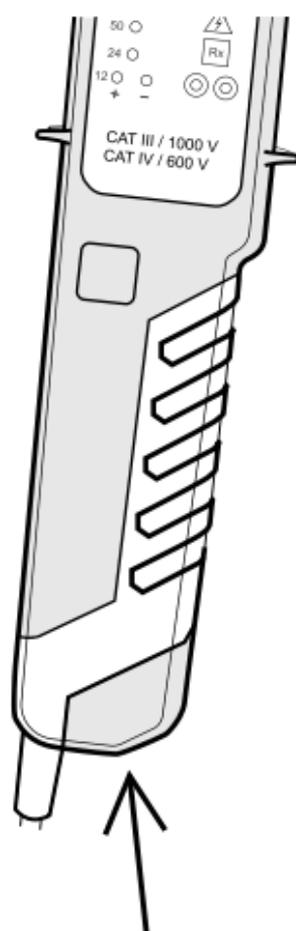
Pull out the battery door.

Fit 2 new 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A).

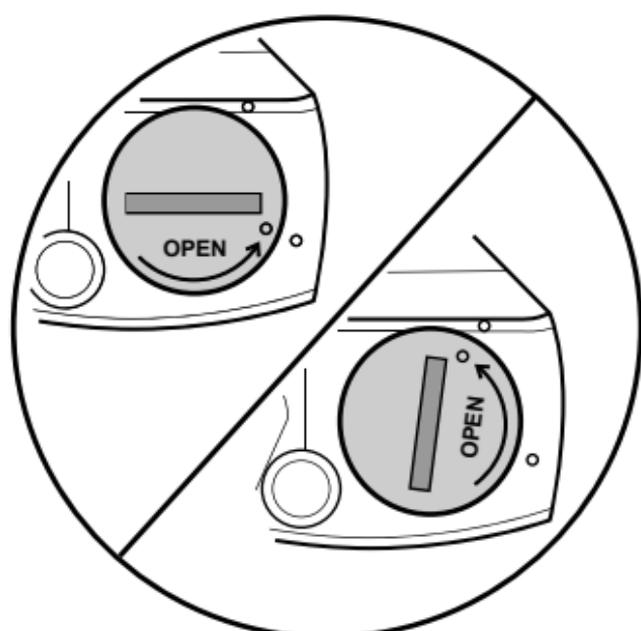
Replace the battery door and turn it clockwise until the dots align and the door is flush with the main body.

**Note:** Do not mix old and new batteries.

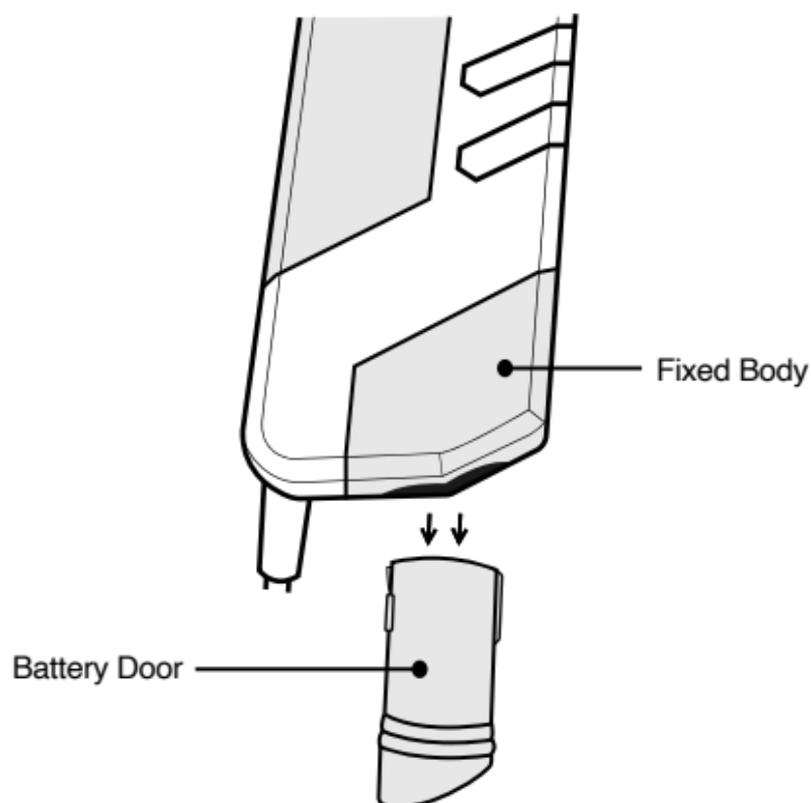
1



2



3



## 4.2 Periodic Testing

To maintain the integrity of the voltage tester, 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](mailto:service@martindale-electric.co.uk)

Tel: 01923 650660

## 4.3 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 tester 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 tester. Allow the voltage tester to thoroughly dry before use.

## 4.4 Repair and Service

There are no user serviceable parts in this unit. 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 batteries.

## 4.5 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.

## **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.



Specification  
VT25/VT28  
Voltage Tester



## **ELECTRICAL**

### **Voltage Detector**

Maximum working voltage: 690V DC & AC rms

Nominal voltage threshold indications:

12, 24, 50, 120, 230, 690V AC/DC

Nominal voltage threshold tolerance:

Conforms to BS EN 61243-3:2014

Internal impedance at ELV a.c.: 260k $\Omega$

Polarity indication: from 12V DC/AC rms

Range detection: Automatic

Response time: <1s to 100% of each nominal voltage

Frequency range: DC, 16 to 400Hz

Test current ( $I_n$ ): <3.5mA

Duty ratio: 30s ON (operated) / 240s OFF (recovery)

Overvoltage protection: 690V DC or AC rms

### **Digital Voltmeter (VT28 only)**

Voltage range: 10V to 690V (DC, 16 to 400Hz)

Resolution: 0.1V

Accuracy:  $\pm$  (3% + 5 digits)

### **Single Pole Phase Test**

Voltage range: 100 to 690V AC rms

Frequency range: 50 to 60Hz

### **Phase Rotation Test**

Voltage range: 120 to 400V AC rms (phase to earth)

Frequency range: 50 to 60Hz

### **Continuity**

Resistance range: 0 to 500k $\Omega$  + 50%

Test current: 3 $\mu$ A

Overvoltage protection: 690V DC or AC rms

## **ENVIRONMENTAL**

Temperature (Operating): -10 $^{\circ}$ C to 55 $^{\circ}$ C

(Storage): -20 $^{\circ}$ C to 70 $^{\circ}$ C, Non condensing

Humidity (Operating & Storage):  $\leq$  85% R.H

Altitude: up to 2000m

Pollution degree: 2



Specification  
VT25/VT28  
Voltage Tester

## **GENERAL**

Power: 2 x 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A)

Battery consumption: 80mA max.

Dimensions packed: 285 x 72 x 41 mm

Weight packed: approx. 250g

Includes: 2 x 1.5V AAA batteries, 2 x probe tip covers, instructions

## **SAFETY**

Conforms to BS EN 61243-3, BS EN 61010-1  
CAT IV 600V, CAT III 1000V

Class II, double insulation

IP rating: IP64 to BS EN 60529

GS38 compliance (with probe covers fitted)

## **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
- 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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