

UDEY®

OPERATING MANUAL

MRL-11

CONTACT RESISTANCE TESTER

WARNING

DANGER

Equipment to be used by trained personnel only

This operating manual contains instructions for the operation of a electrical tester. The operator of this equipment must use good judgment and follow all safety precautions noted in this guide to ensure the protection of him self and others in close proximity to the test area. Failure to follow safety instructions could be dangerous.

Proper grounding of the tester must be done prior to connecting this tester to a power source.

Engineered and manufactured in India by:

UDEYRAJ ELECTRICALS PRIVATE LIMITED
212-A, Hind Saurashtra Industrial Estate,

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TO SUPERVISOR IN CHARGE OF OPERATION

- ❖ If the operator does not read the language used in this manual, translate the manual into appropriate language.
- ❖ Help the operator in understanding this manual before operation.
- ❖ Keep the manual near the tester for easy access by the operator.



FOR YOUR OWN SAFETY

- 1) While the Tester is delivering its Test Voltage, Never touch following areas as it could be dangerous.
 - ❖ The output Terminals.
 - ❖ The Test lead wires connected to output terminal.
 - ❖ The Device under test (DUT)
 - ❖ Any part of the tester, which is electrically connected to output terminal.
 - ❖ All above, immediately after the output has been cut OFF.
- 2) Also Electric shock or Accident may arise in the following case.
 - ❖ The Tester being operated without grounding.
 - ❖ If proper gloves for Electrical Job are not used.
 - ❖ Approach to any part connected to the output terminal while the power of the tester is turned ON.
 - ❖ All above, immediately after the output has been cut-OFF.

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Attention!

POWER SUPPLY

- Supply voltage : 240 V AC Single Phase 50 Hz.
- Line fuse : 5 Amp
- Ac plug : 3 core mains cord with molded inlet and plug.

Environmental conditions:

- Operating environment: 5 ~45°C
- RH : Max 80% non-condensing
- Altitude : Max 1000 m

Do not operate the tester in adverse environments, such as:

- a) Flammable Atmosphere=To avoid fire and explosion hazard.
- b) Un-stable Position=Slant position or where the tester may be subjected to vibrations.
- c) Heat=Nearby a source of heat, Operable temperature of tester is up to 45°C.
- d) High Humidity=Operable humidity range of tester is 20 to 80% RH.
- e) Ill Ventilated Place.
- f) Dusty atmosphere.
- g) Near high sensitivity devices: Such as communication receivers, lest the noise generated by the Tester should interfere with such devices.

SAFETY WARNING



Tests with MRL-11 are capable of high voltage that can cause personal injury or death due to electric shock. The tester should be used only by qualified personnel who recognize the dangers of high voltage. We do suggest that no less than two persons perform the test.

Make certain that the MRL-11 is turned off and that voltage is completely discharged before removing the test leads. Cables can store charge if they are disconnected from the supply while high voltage is on. The charge on the cable can cause injury or damage even after the cable is disconnected from the tester.

Connection to reliable earth is very important.

CAUTION

Attention!

DO NOT CONNECT / DIS-CONNECT TEST LEADS WHEN TEST IS ON THAT IS DURING TEST.

- a) The instrument should be connected to a good ground.
- b) The instrument's working place should keep away from heavy electrical field, heavy magnetic field, high frequency instruments. The less interference comes from power supply, the better the instrument works. If the supply power's interference is too big, you should choose AC power purifier to supply the instrument. The capacity of the AC power purifier should more than 200VA.
- c) If the display did not show on the LCD screen, or the word's color is too thin, you should adjust light regulation-resistance.
- d) The instrument should be stored in dry and well ventilated place. If tester is not used for long-term or the environment is damp, before using, should lengthen to prepare hot time, and do away with the dampness.

General: Before making any insulation tests, isolate, take out of service or dis-connect all apparatus that is the subject of the insulation test.

Capacitance discharge: It is extremely important that when tests are made involving capacitance and dangerously high voltage, as when making tests on cables, transformers etc; that such circuits be discharged at the end of a test. This must be done BEFORE THE TEST LEADS ARE

1.0 INTRODUCTION:

Introduction: Measuring the line loop contact resistance by bridges is not the ideal method as the test current is only a few milli ampere. Thus the value is not the true value of the contact resistance. Model MRL-11 is a direct reading tester, and uses a test current of 100A DC, resulting in true value and accurate measurements.

Model MRL-11 adopts digital circuit technique and is used for measuring contact resistance of switch control equipments at test current of 100A DC. The measurements are accurate as the test is highly stable. 'UDEY' MRL-11 is a new, fully automatic micro controlled tester that measures contact resistance at 100A DC, with large LCD screen, built in printer.

MRL-11 is micro controller operated user friendly, accurate, reliable, small, light weight and reliable tester. MRL-11 incorporates a large LCD screen for display of menu and results. The results are printed on built-in printer after the test is over. MRL-11 incorporates breakthrough technology and design that gives accurate and reliable results, again and again. RS232 link is also provided

2.0 PRINCIPLE:

Principle: Current of 100A DC is passed in the contact and voltage drop across the contacts is sensed, processed and the resistance is displayed on screen. MRL-11 is micro controller operated user friendly, accurate, reliable, small, light weight and reliable tester. MRL-11 incorporates a large LCD screen for display of menu and results. The results are printed on built-in printer after the test is over. MRL-11 incorporates breakthrough technology and design that gives accurate and reliable results, again and again. A true four terminal measurement is used to eliminate the need for lead resistance compensation.

3.0 ADVANTAGES:

The advantages of MRL-11

- Automatic measure of contact resistance in 3 seconds
- True 4 terminal measurements: High accuracy. No lead compensation required
- Test results saved automatically
- Recall and print test results saved
- Prints results on built-in printer

4.0 FEATURES

Features

- Micro-controller operated
- Front panel with legend
- Built-in printer
- Can recall stored last tests results saved.
- Automatic calendar and time running.
- Weight: 4 kg

5.0 SAFETY:

Safety Features

- Fuse protection for line short circuit

6.0 APPLICATIONS:

- Measure rotating machine contact resistance
- Measure breaker element resistance
- Measure resistance of bus bar joints
- Locate poor connections

7.0 DESCRIPTION:

UDEY MRL-11 is a new generation, fully automatic, 4 terminal line loop contact resistance tester.

The entire test is done automatically and quickly. MRL-11 takes over; powers up the test current, takes the readings, and displays the results on the LCD screen. Prints test results through its built-in printer. Test results can be saved in memory and can be recalled later. True portability is achieved by the lightweight (only 4 kg), single unit design housing the MRL-11. The MRL-11 is encased in an aluminum alloy cabinet.

8.0 SPECIFICATIONS

Power supply: 220V±10%, AC 50 Hz.

Measuring range: 0 to 1999.9 µohm

Resolution: 0.1 µohm

Test current: 100A DC

Measurement accuracy: 0.5 class

Display: LCD

Memory: Stores 100 test results.

Printer: Built in printer.

Usage environment: = 40° C.
< 85% R.H.

Accessories: In carrying bag.

Standard Accessories

1. One mains cord.
2. One pair of testing leads.
3. RS interface cable.
4. Soft carrying case.
5. Operating manual.
6. CD containing RS 232 interface program.
7. Paper roll
8. Fuse

9.0 PRINTER:

SP-e series dot printer is a new type of Panel mounted front-loading paper micro Printer. It is a kind of printing device, which can be easily mounted on any kind of instrument panel. It is especially designed for the instrument's panel, that has micro Printer mounted on its panel, and the instrument needs only a rectangle opening(103mm*57mm) to mount the micro printer on its panel. SP-E series micro Printer has special structure of front loading paper and print ribbon, that makes changing paper and ribbon very easily, without removing whole printer, so avoid swinging inner cable, that will enhance the reliability of the instrument it is mounted on..

The printer is composed of turn able front cover, printer head, slide chassis, controlling board, paper axle rod and fastening slides. Its front cover has a transparent window through which print paper quantity can be seen. On the lower side of the front cover's right, there is a key of SEL, and SEL indicator. There is a long rectangle slot on the upper side of front cover, with cutting paper saw on its upper edge. The printer head and paper roll are mounted in the printer box, at back of the cover. The micro printer is fastened by the fastening slides on inter side of the instrument's panel.

Mounting the printer

Insert the printer in to the opening of the instrument. The fastening slides should be put into the holes on both sides of the printer box, then fasten the slides with screwdriver to screw the printer tightly, the printer will cling the instrument firmly.

Loading paper-roll and feed paper

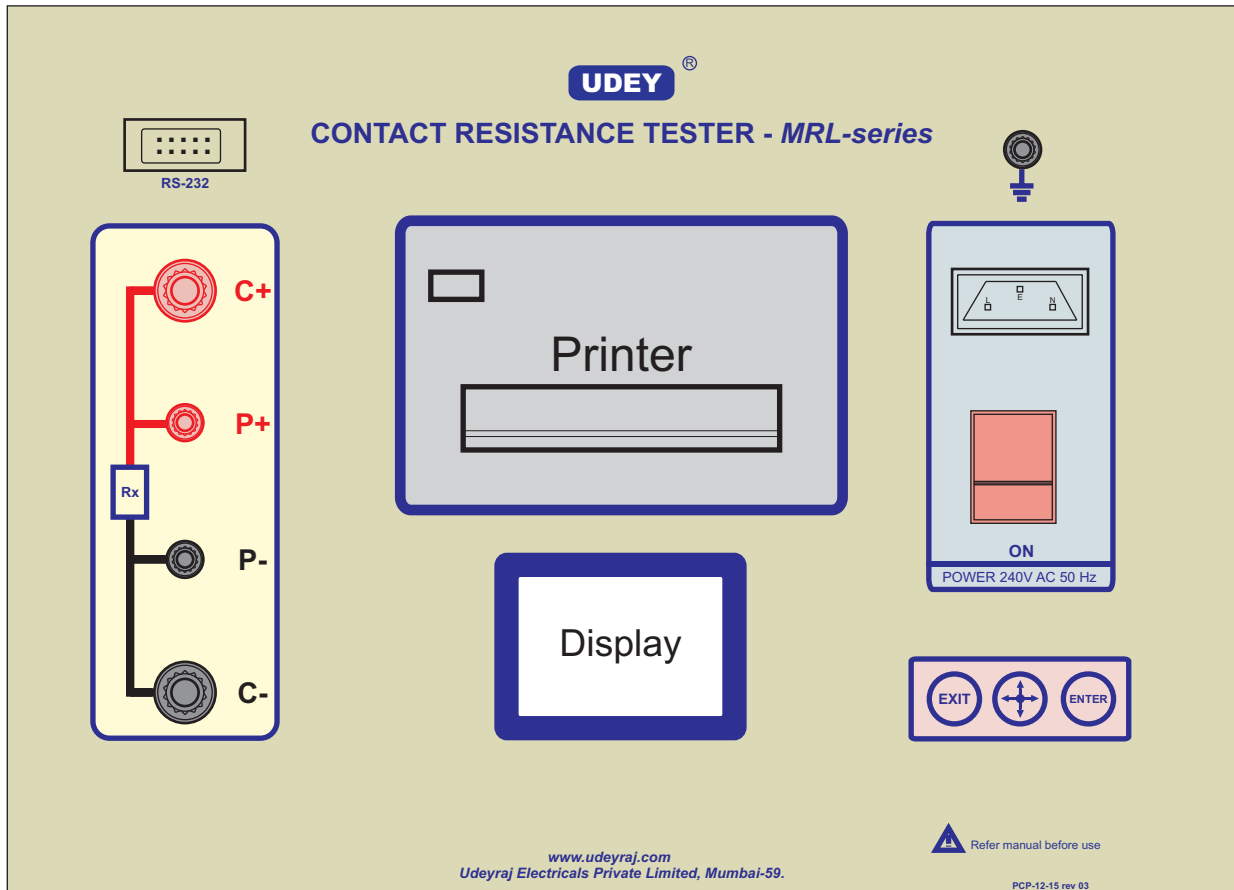
Pulling upper side of the front cover with 2 fingers pinching slightly to uncover the front cover ,drag out ,with 2 fingers pinching the slide chassis clips ,the printer slides chassis about 20 mm ,and then put the paper row axel rod on to the paper roll slots .Lastly ,push the slide chassis back in to the box.. Connect the printer power .After the printer initialed, the indicator will light up. Press the key, for 2 seconds the printer motor starts. Drag out the tip of paper ,and cut paper tip in triangle, and feed the paper straight to printer head in slot ,when paper begins to come out of the exit slot a little ,press the key to stop the motor ,the indicator will turn on ,indicating that the printer is ready for printing .Now ,push back the front cover to shut up the printer box.

If the paper is not fed correctly, it may jam in the printer head, and cannot come out of the exit slot Turn off the power, pull out the slide chassis, drag out the jammed paper, cut twisted paper, push back the slide chassis, and reload the paper in the printer.

Change ribbon

After printing for some time, the printed character will not be clear because of ribbon fading. Pulling upper side of the front cover with 2 fingers pinching slightly to uncover the front cover, press the spring clips of the slide chassis and drag it out about 20mm, the ribbon will appear, remove the old ribbon, replace a new one, and then push the slide chassis back, cover the front cover.


10.0 PANEL LAYOUT & CONTROLS



POWER: 3 pin socket for mains cord with plug and illuminated rocker switch for ON/OFF.

PRINTER: Built-in printer

DISPLAY: Back lit LCD display

KEY FUNCTIONS:  : Cursor movement key. Moves cursor: UP/DOWN/LEFT'RIGHT

EXIT : To go to start menu as figure '1'.

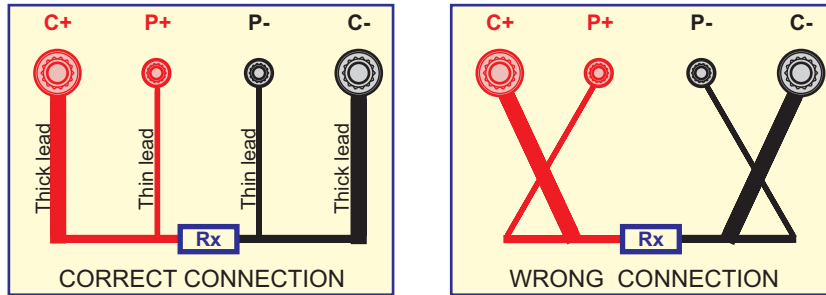
ENTER: To enter command.

Rx : '+C' and '-C' are current output terminals. '+P' and '-P' are voltage sense terminals.

11.0 CONNECTIONS

Attention!

Connect 'Rx' with test leads per CORRECT CONNECTION diagram shown below:



12.0 OPERATING INSTRUCTIONS:

Ensure that connections to 'Rx' are proper and tight.

Connect mains power supply and switch rocker switch ON.

LCD displays as figure 1 below:

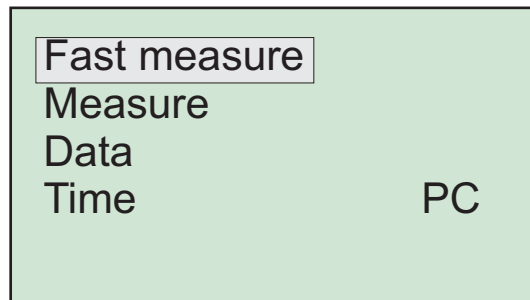


Figure '1'

MEASURE IN 'FAST MEASURE' mode:

'Fast measure' is automatically selected, to start test press 'ENTER' and automatically after approximately 3 seconds 'Rx' and test current are displayed as per figure 2 below:

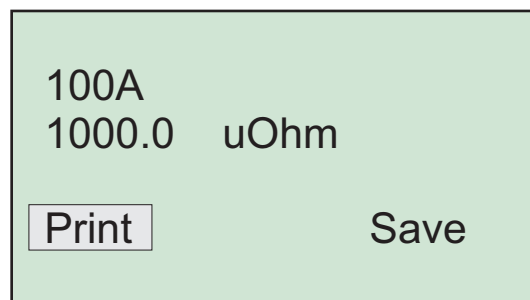


Figure '2'

By default cursor is at 'Print' and to print results, press 'ENTER'. To save results, move cursor with key to 'Save' and press 'ENTER'.

MEASURE IN 'MEASURE' mode:

Select 'Measure' option by moving cursor to "Measure" by  key as per figure 3 below:

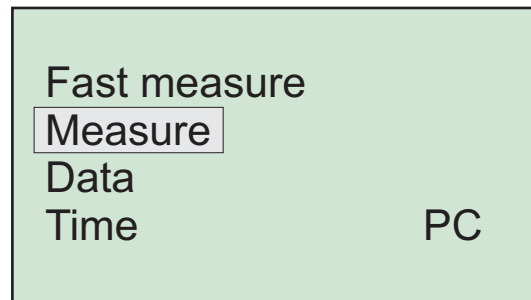


Figure 3

Press 'ENTER' key, test starts and display is as figure '4' below:

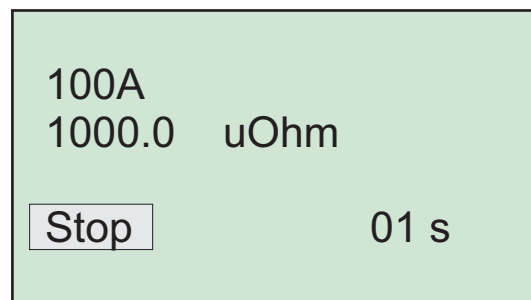


Figure 4

'01 s' displays in count-up mode to 60 seconds. After 60 s test is complete and current output is switched off, display as figure 5 below:

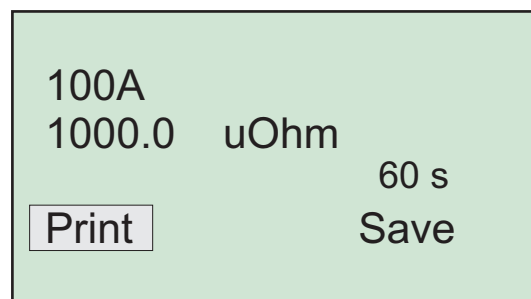



Figure 5

By default cursor is at 'Print' and to print results, press 'ENTER' key. To save results, move cursor by  key to 'Save' and press 'ENTER' key.

TO RECALL SAVED DATA

Press 'Exit' and display will be as figure '1'. Bring cursor by  key and display is as figure '6' below:

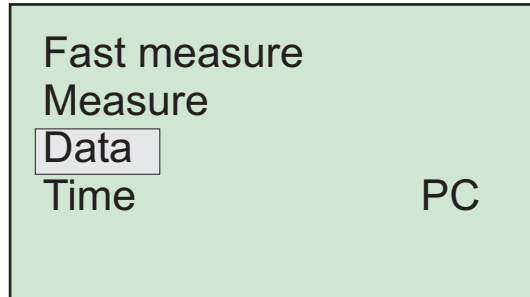


Figure 6

Press 'Enter' and display is as figure '7' below:

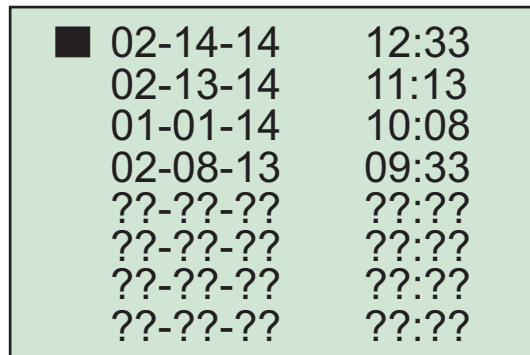


Figure 7

Bring cursor to data to be viewed, by  key. Press 'Enter' key & display is as figure '8' below:

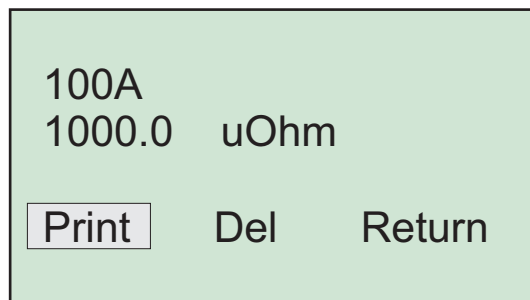





Figure 8

Default cursor setting is on 'Print'. Press 'Enter' key to print. If data is to be deleted, bring cursor to 'Del' by  key and press 'Enter' key. To return to start menu, bring cursor to 'Return' by  key and press 'Enter' key. Display goes as per figure '1'.

TO SET TIME

Go to start menu as per figure '1'. Bring cursor to 'Time' by  key and display shows as figure '9' below:

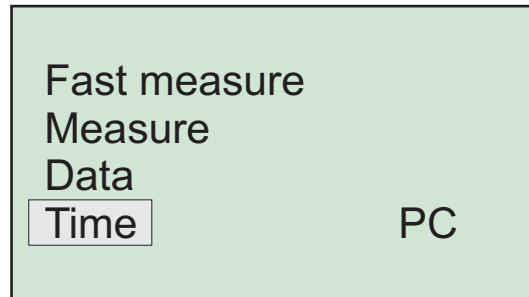


Figure 9

Press 'Enter' key and the display is as figure '10' below:

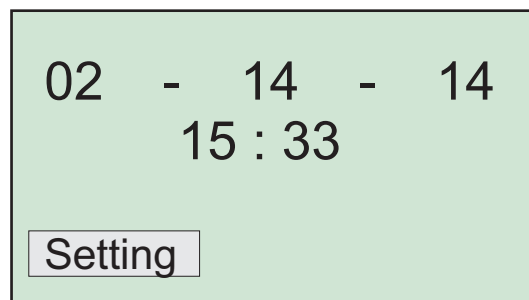


Figure 10

Press 'Enter' key and the display is as figure '11' below:

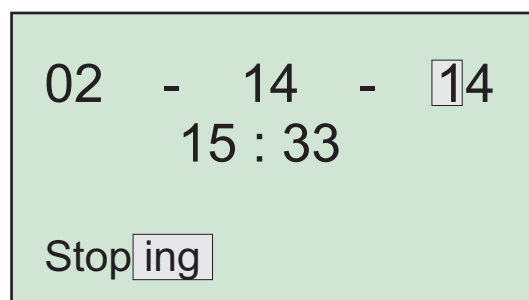



Figure 11

In figure '11': Top left is 'MONTH'; Top middle is 'DATE'; Top right is 'YEAR'.

Lower left figure is 'HOUR' and lower right is 'MINUTES'.

If the figure selected by cursor is to be changed, press 'Enter' key and every one press will increase to next numerical. When desired numerical is reached, move cursor to next figure by  key to the figure to be changed and press 'Enter' key to increase the numerical. In this sequence, complete date and time can be set. After complete setting is done, cursor goes to 'Stoping' and display is as figure '12' on next page:

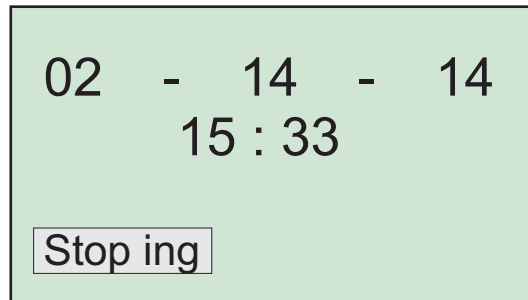


Figure 12

Now press 'Enter' to save setting of date and time. After pressing 'Enter' display goes back to starting menu as seen in figure '1'.

PC OPTION:

Bring cursor to 'PC' by  key as figure '13' below:

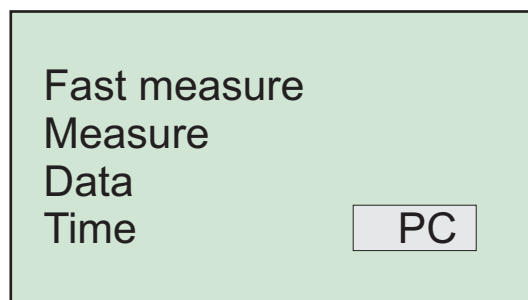


Figure 13

Link the RS-232 cable to the PC and then press 'Enter' and the tester is ready for Rs-232 use.

13 SERVICING / REPAIRS

- 13.1 No user serviceable parts inside. Hence refer servicing to qualified service personnel.
- 13.2 The manufacturer's spare-parts and repairs division is:



UDEYRAJ ELECTRICALS PRIVATE LIMITED
212-A, Hind Saurashtra Industrial Estate,

Safety

Safety symbol



You will find this symbol with all safety precautions and warnings in this operating manual where danger to life and limb exists. Please follow these warnings and act particularly careful in these cases. All safety precautions and warnings need to be passed on to other users. Apart from the information in this operating manual, the generally valid safety and accident prevention regulations must be observed.

Attention

You will find this Attention ! sign at places in this operating manual, which must be observed very carefully, so that the guidelines, regulations and indications and the correct operating process, are observed. This is also necessary to prevent that the testing device and/or other parts of the equipment are damaged or destroyed.

Attention!

Regulations for safety at work

The following regulations for safety at work are to be strictly adhered to:

The UDEY Contact Resistance Tester has been designed according to the latest developments in technology and is operationally reliable. However, should unqualified personnel use this testing device, in an inappropriate way or for improper use, this testing device can be dangerous.

Each person in the factory of the user that deals with the installation, the operation and the maintenance of Contact Resistance Tester must have read and understood the complete operating manual and particularly the information on safety. We recommend that the user has this confirmed in writing (see annex).

The UDEY Contact Resistance Tester serves for testing voltage-free test objects, only. Any use other than that is not in accordance with the application of this device. Any damage resulting from improper use will not be covered by the supplier/manufacturer. In such cases the user bears all risks.

It is also necessary to follow the installation-, operating- and maintenance/repair conditions specified by the manufacturer/supplier.

The UDEY Contact Resistance Tester may only be operated, maintained and repaired by authorized, trained and instructed personnel, which must have participated in a special training covering all possible risks.

Upon any kind of work concerning commissioning, operation, repairs and maintenance, the switching-off and switching-on procedures indicated in the operating manual must be considered.

Any working manner that impairs the safety of the testing device must be refrained from.

The operator is obliged to report any change at the testing device, that impairs the safety, immediately to his superior (e.g. to the person in charge for measuring devices) or to Udeyraj Electricals Pvt Ltd.

Unauthorized modifications and changes, which impair the safety of the testing device, are not allowed. All work at the testing device must be done when it is voltage-free and switched-off.

Before commissioning and after maintenance/repairs it must be checked, whether all protection devices are installed properly and functional. Protection devices must never be removed.

For the operation of Contact Resistance Tester please take particular note of the regional safety regulations and regulations for the prevention of accidents

Important information for users of high-voltage testing equipment



Caution! High voltage!

Touching high voltage can result in loss of life! Equipment, measure leads and accessories must be in perfect condition and need to be checked regularly. The equipment may only be used in dry state and in dry rooms. Only suitable qualified personnel or trained personnel under supervision of specialists must work on this equipment.

Usage

The relevant regulations, (State requirements and laws) , must be followed strictly. Every day before starting work, equipment, accessories and supply line must be visually examined to ensure their perfect condition. Every user must be familiar to the safety instructions in this manual and should be aware of all possible risks. He is obliged to protect himself and others against possible accidents. Because of the necessary personal responsibility, all users must be selected carefully and need to be trained in detail at least once a year.

The training must be put on record. Maintenance and alterations of the tester are reserved to the manufacturer. (Unauthorized alterations endanger the safety). For checking, the UDEY tester can be sent (postage paid) to the manufacturer.

Working with high-voltage

Do not touch the test object, test leads, while test is ON.
Do not test on metal surfaces (the voltage could be carried over).
During non-working time the high voltage must be switched off!

General information

This operating manual has been made with the utmost care. However, Udeyraj Electricals P.Ltd cannot be held liable for possible mistakes in this operating manual and their consequences. We reserve the right for technical changes. Udeyraj Electricals P.Ltd shall not be liable for any mistakes in this manual.

This operating manual has been written with the intention to be read and understood in all details by those responsible for the UDEY Contact Resistance Tester. The complete documentation should always be kept within easy reach of the testing device. Details of great importance for operating the tester are pointed out to in this operating manual. Only the knowledge of this operating manual will ensure that mistakes with this testing device can be avoided and guarantees trouble-free operation. It is therefore of great importance that this operating manual is known to the relevant persons.

We recommend reading this operating manual carefully, because we will not accept liability for any damage or operating trouble resulting from disregarding this operating manual. Should you nevertheless have difficulty with the operation, please do not hesitate to contact our service department.

Range of application

Attention!

UDEY Contact Resistance Tester has been designed to be operated only within the range of application found under SPECIFICATIONS. This testing device may only be operated within the indicated range of application; otherwise warranty is not valid.

Copyright

Udeyraj Electricals P.Ltd holds the copyright for this operating manual. This operating manual has been written for the operating and supervising personnel of the tester. It contains instructions and technical illustrations that may neither completely nor partly be copied, distributed or used for competition purposes or given to a third party.

Range of application

The Udey Contact Resistance Tester is designed for testing voltage-free contacts resistance.

Any usage other than this is regarded as not appropriate.

For any damage resulting from inappropriate usage, the manufacturer/supplier can not be hold liable; the user bears all risks.

Before the tester is switched on for the first time or after it has been transported, it needs to adapt to the ambient temperature first. Please unpack the device and put it on a table. You should wait at least 30 minutes before switching it on.

The device must not be exposed to the condensation of water.

Attention!

We are pointing out that for calibration check of the testing device regarding its correct accuracy, it is necessary to use a calibrated resistance . This calibrated resistance is connected to the test leads of the testing device and it is tested, whether the values of the resistnce are the same as the measured values.

In order to make sure that the comparison data are correct, resistance must be calibrated annually.

Attention!

We should like to point out: Every year and after every modification (repair), which could influence the measuring equipment, the testing device must be calibrated and, if necessary, adjusted. The supplier/manufacturer will test the device regarding its accuracy and confirm the calibration in a certificate.

Warantee & Liability

The testing device has been designed according to the latest developments in technology, checked and is therefore operationally reliable. In case the tester is maintained or repaired improperly by persons not authorized by Udeyraj Electricals Pvt Ltd., the liability will in any case be passed on to the owner.

The same applies if the testing device is operated in any other way than described in this manual.

The user is obliged to operate the tester only in perfect condition.

Udeyraj Electricals Pvt Ltd is liable for mistakes and omissions, with the exception of further claims, only within the framework of the warantee commitments in the order confirmation (respectively the commitments in the offer).

In view of the permanent development and improvement of our products, we reserve the right for technical modifications at any time. Such modifications, mistakes and misprints do not imply a claim for damages.

Furthermore, only original UDEY spare parts and accessories may be used. For any damage arising from non-observance of the instructions in this operating manual Udeyraj Electricals Pvt Ltd., do not assume liability. Only the Indian original of this operating manual is binding. The above information does not extend the liability- and warrantee agreements of the conditions of sale and delivery of Udeyraj Electricals Pvt Ltd.

14.0

WARRANTEE

UDEYRAJ ELECTRICALS PRIVATE LIMITED warrant to the original purchaser that this instrument is free from defects in material and workmanship under normal use or / and as specified in the instruction manual or product information leaflet for a period of one year from the date of purchase from the company or its Authorized Dealers / Franchisees. Any instrument found defective within this warranty period and returned to the Factory on door delivery basis, securely packed, transportation charges pre-paid, will be repaired, adjusted or replaced at no charge to the Original Purchaser.

This warranty does not cover

- a. Damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal unintended usage, failure to follow instruction as laid in the manual, improper installation or maintenance, alteration, unauthorized modifications, lightening or other incidences of excess voltage or current as evaluated by the company.
- b. Any repairs other than those provided or advised by the Company in writing.
- c. Expendable items such as Lamps, Fuses, Batteries, Test Leads etc.
- d. Cosmetic Damage.

In such cases where the warranty is not applicable, repairs will be billed at nominal cost.

NO OTHER WARRANTY EITHER EXPRESSED OR IMPLIED SHALL BE APPLICABLE.

15.0

SERVICE FORM

Please fill in the following form and return with instrument:

1.0 Name+ address of customer:

2.0 Serial # ; Bought from:

3.0 Problem / fault observed:

4.0 Details of use: [diagram of test set up and connections with DUT]

5.0 Details of accuracy checks made if any:

a] Standard used:

b] Accuracy of standard:

c] Validity of standard:

d] Name of person who checked:

6.0 Environment in which verification made;

a] Room temperature:

b] Relative humidity:

7.0 Environment in which product is used:

a] Room temperature:

b] Relative humidity:

c] Dry bulb temperature:

d] Wet bulb temperature

8.0 Additional info: