



Operating Instructions

ZETA 50 /50K/M/R

High-Voltage Insulation Tester with
Rechargeable Battery or Crank Generator &
mains operating mode

Option
Crank Generator



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1. Safety Precautions

The ZETA 50/50K/M/R insulation Tester is manufactured and tested in accordance with the following standards :

IS 2992
IEC 1010-1/EN 61010-1/VDE 0411-1,
IEC 61557/EN 61557/VDE 0413

In order to maintain flawless technical safety conditions and to assure safe use, it is imperative that you read the operating instructions carefully and thoroughly before placing your instrument into service, and that you follow all points contained therein.

Repair and Parts Replacement

Voltage conducting parts may be exposed when the instrument is opened. The instrument must be disconnected from all sources of voltage before repair or replacement of parts. If the repair of an open, live instrument cannot be avoided, this may only be performed by trained personnel who are familiar with the dangers involved.

Errors and Extraordinary Strains

It may be assumed that the instrument can no longer be operated safely, it must be removed from service and secured against unintentional use. Send the instrument to the Repair and Replacement Parts to Service Department. See (chapter 11, page 11). Safe operations can no longer be relied upon,

- if measurement cables are damaged,
- if the instrument demonstrates visible damage,
- if the needle gauge no longer responds,
- if one of the LEDs is defective,
- if the instrument no longer functions,
- after lengthy periods of storage under unfavorable conditions.

Observe the following safety precautions:

- Be prepared for the occurrence of unexpected voltages at devices under test. (For example, capacitors can be dangerously charged.)
- Make certain that measurement cables are in flawless condition, e.g. no damage to insulation, no creases, no interruptions etc.



Caution: High-Voltage !

Do not touch the test probes or the Device Under Test (DUT) during voltage testing!

High-Voltage of up to 5 kV is present!



Attention !

Accumulation of Moisture

An accumulation of moisture on the tester, on the measurement cables or on the DUT must be avoided, because leakage currents may be caused by high-voltages at exposed surfaces. Even isolated components may carry high-voltages.



Note

Over voltage influence

It is reversible fuse (PTC thermistor) responds to an over voltage or an extraneous voltage, measurement may not be resume immediately. A cool-down period of approximately 2 minutes must be observed.



Note

Maximum rated voltage to earth is 1000 V ~, even if permanently connected measurement cables for 2 kV ~ CAT II are permissible.

Meaning of symbols on the instrument



Warning concerning a point of danger
(Attention: observe documentation)



Caution: High-Voltage!
A life endangering high-voltage of up to
5 kV is present at the test probes.

1000V CAT II Over voltage category II device



Continuous double, or reinforced
insulation

CAUTION:

Instrument readings can get affected under the influence
of HT & LT fields

2. Applications

The ZETA 50/50K/M/R Insulation Tester complies with regulation IS-2992 IEC 61557/EN 61 557/VDE 0413 "Measuring and Monitoring equipment for the testing of electrical safety in systems with nominal voltages of up to AC 1000 V and DC 1500 V" part 2, Insulation Resistance Testers.

It is suited for the measurement of Insulation Resistance for devices and systems in a voltage-free condition with nominal voltages of up to 1000V. It is also suited for the measurement of Insulation Resistance of up to 1 T Ω with open-circuit voltages of up to 5000v.

Additionally, the tester is equipped with a 2000V measuring range for direct and alternating voltages. This is especially advantageous for the testing of DUTs for the absence of voltage, and for the discharging of capacitive DUTs.

3. Initial Start-up

3.1 Battery installation



Attention!

Before opening the battery compartment (green side panel) be absolutely certain that the function selector switch is set to the "V" position, and that the range selector switch is set to the "OFF/V" position, and that the device is completely disconnected from all external power circuits.

- ⇨ Unscrew and remove the battery compartment.
- ⇨ Remove the battery clip.
- ⇨ Pull the battery holder out of the battery compartment.
- ⇨ Insert 6 commercially available 1.5 V type IEC R 20 or IEC LR 20 batteries or storage batteries (single cell) into the battery holder with correct poling as indicated by the symbols.
- ⇨ Push the battery holder back into the battery compartment.
- ⇨ Push the battery clip back over the contacts making certain that correct poling is assured.
- ⇨ Return the battery compartment to the housing in the correct direction (labeling must be legible) and fasten with screws.

3.2 Testing the Battery

After the batteries have been installed, or if the Ω indicator LED fails to light up during insulation resistance measurement, the batteries should be tested. For battery testing the range selector switch must briefly be set to the —|— position. Deflection of the needle gauge within the —|— scale for the battery test indicates the condition of the batteries or storage batteries at an average load of 1000 V test voltage. The position of the function selector switch need not be taken into consideration. The left end of the scale represents minimum required supply voltage, and the right end represents maximum available supply voltage.

3.3 Mains Supply Testing :

For mains Testing, switch ON mains Supply & range selector switch must briefly be set to the —|— position. Deflection of the needle gauge should be within —|— scale.



Note

If the needle only moves into the minimal supply voltage range, several measurements can still be performed for test voltage of less than 1000V, because the battery test is conducted with the same load as is used for a test voltage of 1000V.

3.4 Switching the Tester On and Off

As long as the function selector switch is set to Ω and the range selector switch is not in the OFF/V position, the tester remains activated. For purpose of transport and maintenance we recommend that the function selector switch to the OFF/V position in order to prevent unintentional activation of the tester.



Note

Be certain that the grip on the function selector switch points exactly to "V" or " Ω ". No intermediate selector switch positions have been defined, and inaccurate switch positioning leads to meaningless measurement results. This is especially important during discharging of capacitive devices under test, because voltage are not displayed in intermediate selector switch positions.

3.5 Analog Display

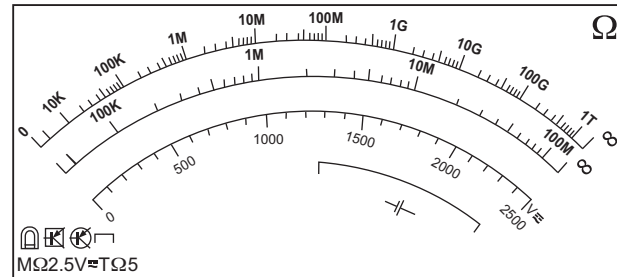
Logarithmic representation of the upper resistance scale allows for quick recognition of the magnitude involved.

In order to achieve the required accuracy for testing of protective measures, the RANGE key allows for switching to the expanded lower limit measuring range of 100 k Ω ... 100 M Ω .

The yellow colored LEDs, (4) and (5), at the right end of the scale indicate which of the, two resistance measuring ranges is currently active.

The Ω indicator LED lights up green to confirm correct insulation measurement. If this LED does not light up, test voltage has not been achieved. In this event a battery test is advisable and recharge battery by connection with mains supply.

The two lower scales are for voltage measurement; see chapter 4 and battery testing; see chapter 3.2.



4. Direct and Alternating Voltage Measurement

Direct voltages and sinusoidal alternating voltages with frequencies ranging from 15 to 500 Hz can be measured with the tester. Deflection of the needle at the instrument is always positive for the direct voltage measurements, regardless of polarity at the connections. Alternating voltage is indicated as an effective value.

Voltage measurements are used to test for the absence of voltage prior to insulation resistance measurements, as well as for the automatic discharge of capacitive devices under test. The voltage drop can be observed at the display.



Note

Voltage measurement can always be performed with the function selector switch in the "V" position regardless of the position of the range selector switch (even without batteries).

- ⇒ Set the function selector switch to the "V" position.
- ⇒ Check to see that the needle points to "0" in the V scale when the test probes are not connected. Reset the needle as required with the adjustor screw for mechanical zero adjustment.
- The position of the range selector switch has no influence on voltage measurements, although we recommend setting it to the OFF/V position.
- ⇒ Contact the measuring points with both test probes.
- ⇒ Read the measurement value at the V scale.



Note

Voltage of greater than 2000V may not be applied. Input resistance for voltage measuring range is equal to 5M Ω .

5. Insulation Resistance Measurement

Be certain that the device under test is voltage-free before performing measurements; see chapter 4.

For measurements within a range of 100 G Ω (10 G Ω ... 1 T Ω), the guard cable must be used; see chapter 5.3, page 6.

5.1 Measurement Procedure

- ⇒ Set the function selector switch to the " Ω " position, in order to activate test voltage.
- ⇒ A range of either 10k Ω ... 1T Ω or 100 k Ω ... 100 M Ω can be pre-selected with the RANGE key.
- ⇒ Select the required nominal voltage of 100V, 250V, 500V, 1000V, 1500V, 2000V, 2500V or 5000V, with the range selector switch depending upon the nominal voltage of the DUT. When lit, the LED (4) indicates the upper limit measuring range of 10 Ω ... 1 T Ω has been activated.
- ⇒ Contact the measuring point with both test probes and wait until the needle has come to rest. Depending upon the DUT this might take only a few, or up to 30 seconds, if, for example, large capacities (long cables) must be charged.
- ⇒ Read the measurement value from the upper scale. If the Ω indicator LED lights up green, the insulation measurement is valid. If this LED does not light up, test voltage has not been achieved. In this event a battery test is advisable; see chapter 3.2, page 3. If battery voltage is low, recharge the battery with mains supply.
- ⇒ In order to achieve the required accuracy for testing of protective measures, select the high resolution range, 100k Ω ... 100M Ω with the help of the RANGE key. The LED (5) lights up.
- ⇒ Contact the measuring point with both test probes once again. Read the measurement value from the lower scale.



Attention !

Do not touch the conductive ends of the test probes when the instrument has been activated for the measurement of insulation resistance.

This may cause current to flow over your body, which, although it does not reach life endangering levels, causes a clearly discernible shock.

When measurements are made at capacitive devices under test, e.g. cables, the DUT may be charged with voltages of up to approximately 5000V, depending upon selected nominal voltage. In this condition contact with the DUT after measurement, it is dangerous to life !

For this reason the DUT must be discharged in a controlled fashion by switching to V and contacting the DUT during discharging, because internal over voltage protection would otherwise be triggered. If the capacity to be discharged is greater than 3 μF , the poles may absolutely not be reversed, because the device might otherwise be damaged.



Note

Over voltage influence

If the reversible fuse (PTC thermistor) responds to an over voltage or an extraneous voltage, measurement may not be resumed immediately. A cool-down period of approximately 2 minutes must be observed.

5.2 Evaluation of Measurement

In order to assure insulation resistance values do not fall below those required by IS/IEC/DIN/VDE regulations, insulation tester inherent deviation and influence errors must be taken into consideration.

Required minimum display values for insulation resistance which take maximum operational measurement deviation of the ZETA 50/50K/M/R into consideration (under nominal conditions of use) can be determined with the following table. These are sure that actual values do not fall below the required limit values. Intermediate values can be interpolated.

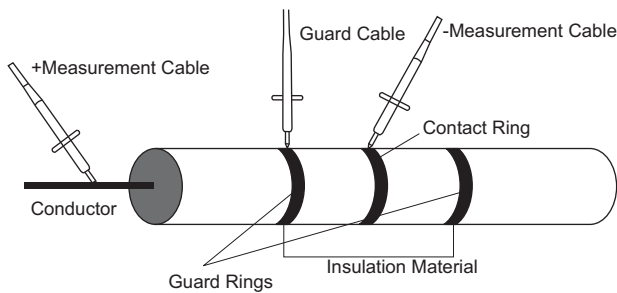
The table is valid for test voltages ranging from 100V ... 1000V.

Scale, 100 k Ω ... 100 M Ω	
Limit Value [k Ω]	Display Value [k Ω]
100	130
200	260
300	400
400	550
500	700
Limit Value [M Ω]	Display Value [M Ω]
1	1.3
2	2.6
3	4
4	5.5
5	7
10	13

5.3 Measurement with the Guard Cable (Optional)

The measurement of very high impedance resistance presupposes extremely small measurement currents, and can be rendered problematic by influences such as electromagnetic fields, moisture or surface currents. For this reason, the measurement set-up must be implemented in an accurate fashion.

For measurements within a range of 100 GΩ (10 GΩ)... 1TΩ a guard cable must be used in order to prevent the distortion of measurement results caused by surface currents. The guard rings prevent current at the surface of the insulation material from flowing from the + measurement cable to the measurement cable, instead of through the insulation material itself.



- ⇒ Insert the guard cable plug into the appropriate jack at the tester.
- ⇒ Plug the crocodile clip onto the guard cable test prod.
- ⇒ Clip the crocodile clip onto the guard ring located between the two measuring points of the Insulation material to be measured.
- ⇒ See chapter 5. 1, page 5 for measurement procedures.

6. Characteristic Values

Insulation Resistance

Meas. Range	Nominal Range of use	Nom/Open Circuit Volt. U_N / U_O	Nominal Current I_N	S. C. Current I_K	Inherent Deviation ¹⁾	Service Meas. Deviation
100kΩ 100MΩ	100kΩ 100MΩ	100V 250 V 500 V 1000 V	1 mA	1.3 mA	± 2.5%	± 30% of rdg.
10kΩ 1TΩ	100kΩ 100GΩ	100/1500V 250/2000 V 500/2500 V 1000/5000 V	0.7 mA 0.5 mA 0.4 mA 0.1 mA	1.3 mA	± 5%	

Insulation Resistance (For Mains Operated)

Scale/ Standard	Nom/Open Circuit Volt. U_N / U_O	Meas Range	Nominal Current I_N	S. C. Current I_K	Inherent Deviation ¹⁾	Service Meas. Deviation
① VDE 0413	100V/250V 500V/1000V	100kΩ 100MΩ	1 mA	1.3 mA	± 2.5%	± 30% of rdg.
②	100V/250V 500V/1000V	10kΩ..ITΩ (Except 10MΩ)	1 mA	1.3 mA	± 5%	
②	1500V 2000V 2500V 5000V	10kΩ..ITΩ (Except 10MΩ)	0.7 mA 0.5 mA 0.4 mA 0.1 mA	1.3 mA	± 5%	
②	100V/250V 500V/1000V 1500V 2000V 2500V 5000V	10MΩ	1mA 1mA 0.7 mA 0.5 mA 0.4 mA 0.1 mA	1.3 mA	± 6.5%	

Direct and Alternating Voltage

Measuring Range	Frequency	Internal Resistance	Max. Allowable Voltage	Inherent Deviation ¹⁾
0...2000V AC/DC	15... 500 Hz	5 MΩ	2200 V AC/DC max, 10S	± 5%

Protective Devices

Terminal	Internal Resistance	Max. Allowable Voltage	Protective Device
- Measurement cable	-	-	Via grounded damping diodes
+ Measurement cable Insulation Measurement	-	to-meas, cable; to guard cable; 2000 V AC/DC max. 10s	Diodes in high-voltage cascade, PTC thermistor ²⁾ and series resistors
Guard cable	Between guard and meas. Cable 90 kΩ	To meas cable 2000 V AC/DC max. 10s	PTC thermistor ²⁾ and series resistors
Battery	-	10 V	Pole protection with diodes voltage limiting in battery charger (optional)

1) as related to scale length

2) PTC thermistor cool-down period until start of new measurement : at least 2 minutes must be observed !

Response Time < 100 GΩ < 3 s;
> 100 GΩ < 8 s
also valid for test voltage or measuring Range changes.

Display

Movement Core - magnet moving coil mechanism.
Scale length 111.5mm (longest scale)

Reference Conditions

Ambient +23°C= ± 2 K
Relative Humidity 45... 55%
Meas. Magnitude
Frequency 50Hz ±10 Hz (for voltage measurement)
Mains Voltage
Waveform sine, deviation between effective and rectified value < 1%
Battery Voltage 8 V_±1%
Operational
Position horizontal

Power Supply

Battery or Storage

Battery (Rechargeable) 6 nos. 1.5 V, 6000 mAh, single cell per IEC LR20

Working Range 6V ... 9.5V

Battery Service life 7500 measurements at 1000V test Voltage with 1MΩ measuring shunt.
15,000 measurements at 500 V test Voltage with 500 kΩ measuring shunt, With 5s measurement and 25s pause.

Power Supply (Mains) :-

Mains Supply : 230VAC, ±15%, 50HZ

Nominal Voltage : 9V

Ambient Temperature

Operating Temperature

Range 0°C ... 40°C

Storage Temperature

Range -20°C...+60 °C (without batteries)

Climatic category 2z/0/40/-20/75%

In compliance with VDI/VDE 3540

Relative Humidity max. 75%, no accumulation of moisture
Elevation to 2000 m

Electrical Safety

Protection Class II
Test Voltage 5.4 kV~
Over voltage Category II
Contamination Level 2
Protection IP 52

Electromagnetic Compatibility EMC

Interference Emission EN 50081-1: 1992

Interference Immunity EN 50082-1:1992

Mechanical Design

Dimensions W X D X H
290mmX250MMx140MM

Weight 3.4 kg with batteries

4.5 kg (With Mains operated + batteries)

7. Maintenance



Attention!

Before replacing batteries completely disconnect the device from all external circuits.

For purpose of transport and maintenance we recommend that the range selector switch be set to the OFF/V position in order to prevent activation of the tester.

7.1 Batteries (Rechargeable)

The condition of the batteries should be checked from time to time. Discharged or corroded batteries must be removed from the battery compartment. If leakage occurs at the batteries, battery electrolyte must be completely removed and the batteries replaced.

The batteries must be recharged when :

- ⇒ The needle gauge no longer climbs into the scale which contains the battery symbol when the range selector switch is set to the battery test position.
- ⇒ The indicator LED for the selected test voltage does not light up green.
- ⇒ Rechargeable Battery Cycle life 50 to 500 cycles.
- ⇒ Full battery recharged time is 15 Hrs.
- ⇒ The device need not to be disconnected from mains power after batteries are fully charged (Over charge protection)
- ⇒ Overcharge cut off is of 9.5 V.

Batteries are to be replaced as described in chapter 3.1, page 3. Always replace batteries as a complete set!

7.2 Housing

No special maintenance is required for the housing. Keep outer surface clean and dry. Use a slightly dampened cloth for cleaning. Avoid the use of cleaners, abrasives and solvents.

7.3 Measurement Cables

Damaged or buckled measurement cables may not be used under any circumstances, because this may cause a reduction in insulation performance. The permanently connected test cables are double insulated.

Inspect the measurement cables on a regular basis. We recommend that a thorough inspection be carried out every 6 to 12 months.



Attention

Even if only very slight damage is apparent at the measuring cables, we recommend that you send the tester, together with the cables, to the Repair and Replacement parts Service Department.

7.4 Repair

Parts Replacement and Calibration

Voltage conducting parts may be exposed when the instrument is opened. The instrument must be disconnected from the measuring circuit before repair, replacement of parts or calibration. If the repair of an open, live instrument cannot be avoided, this may only be performed by trained personnel who are familiar with the dangers involved.

7.5 Replacing the Mains Fuse



Attention !

Disconnect the device from measuring circuit at all poles before opening the fuse compartment !
Disconnect the device from the mains.



Attention !

Use only **specified , original replacements fuses!**
Bypassing or repairing fuses is prohibited!
If **fuses** with other current rating, breaking capacity or blowing characteristics are used, the device may be damaged!

- ⇒ Open the fuse compartment at the inlet sockets with suitable tool (e.g. a screw driver.
- ⇒ Replace the blown fuse with a new fuse with identical specifications.
- ⇒ Close the fuse compartment.

8. Crank Generator Operating Mode

8.1 Installing the Crank Generator

- ⇒ Set the range selector switch at the ZETA 50/50K/M/R to the "OFF/V" position and the function selector switch to "V" position
- ⇒ Disconnect the measurement cables from the device under test
- ⇒ Unscrew and remove the battery module
- ⇒ Pull the battery clip out, and save the battery module for possible later use.
- ⇒ Plug the battery clip onto the Crank Generator module
- ⇒ Insert the Crank Module into the instrument with the Crank handle on top. Be certain that the rubber is not separated from the Crank Generator.
- ⇒ Secure the Crank module with 4 screws. (see page 15 for fig.)

8.2 Operating the Crank Generator

Fold the Crank handle out until it snaps into place.



Attention!

Turn the crank in the direction indicated by the arrow. The crank generator is difficult to turn in the other direction, and the protective devices at the generator and in the instrument may be destroyed after several rotations ! Brief, inadvertent rotation in the wrong direction causes no damage. Fold the Crank handle to its closed position before transporting the instrument.

Measuring the Insulation Resistance in the Crank Generator Operating Mode.

- ⇒ Establish contact with the DUT first, preferably with the included alligator clips.
- ⇒ If this is not possible, and if contact must be established with the test probes, you will need a second person for assistance
- ⇒ Select the test voltage with the range selector switch.
- ⇒ Set the function selector switch to Ω
- ⇒ Turn the crank in the direction indicated by the arrow at a speed, which causes the Ω signal LED at the upper right hand portion off the display to light up and burn continuously.



Note

Over voltage influence

If the Ω signal LED is not lit, or if it flickers, test voltage is too little power is being delivered by the Crank Generator. (Measurement values are valid only if the Ω signal LED is continuously lit.) For high capacitance DUTs (cables, large machines and transformers), continue cranking until the needle gauge has stabilized. The Ω signal LED must be continuously lit during testing. This may take as long as several minutes, depending upon the capacitance of the DUT. Battery operation is recommended in such cases.

8.3 Discharging the Device Under Test.

The function selector switch must be switched from Ω back to V, in order to discharge test voltage from DUT. The range selector switch can be left at the original setting. The Crank need not be operated in order to discharge the device under test.

8.4 Measuring voltage in the Crank Generator Operating Mode.

The Crank need not be operated for the measurement of voltage. Voltage applied to the DUT is always displayed when the V/ Ω function switch is set to V.

8.5 Characteristic Values

Nominal Voltage	7.5 V (at approx 2.5 r.p.s)
Nominal Power	4W (at approx 2.5 r.p.s)

Ambient conditions

Same as ZETA 50A/AK/M/R (battery module)

Electrical Safety (installed)

Over voltage category	Insulation measurement- 5000 V DC- no overvoltage Voltage measurement- 600V - CAT III Voltage measurement- 1000V- CAT II
Contamination Level	2
Protection	IP 52

9. Mains Operating Mode

9.1.Connection of Mains Operating Mode

- ⇨ Connect the power cable to back side of housing to power supply socket.
- ⇨ There is no necessity of disconnection of battery or Crank generator.
- ⇨ Simply power ON mains supply, it will disconnect battery or crank generator & mains power supply will into consideration.
- ⇨ Set range selector switch to $\rightarrow|$ position check deflection of needle gauge within $\rightarrow|$ scale.
- ⇨ Set range selector switch to Ω , which cause Ω signal LED at upper right hand position of the display to light up & burn continuously.

9.2.Characteristic Values

Nominal Voltage : 9V
Ambient Conditions :
Same as ZETA 50A/AK/M/R (battery module)

10.Standard scope of supply

- 1 High-voltage insulation tester with permanently connected measurement cables and test probes,
2 crocodile clips (5 kV version)
and plug-in battery module including batteries
- 2 Carrying strap
- 3 Operating instructions.
- 4 Test certificate

11.Accessories

- 1) Crank Generator



- 2) Carrying Case



- 3) 3 pin power supply cable

12. Product Support, Repair and Replacement Part Service

If required please contact

Sifam Tinsley Instrumentation

3105, Creekside Village Drive,
Suite No 801, Kennesaw,
Georgia 30144
Contact Number: +1.404.736.4903
Web: www.sifamtinsley.com

Sifam Tinsley Instrumentation Ltd.

Central Buildings, Woodland Close,
Old Woods Trading Estate,
Torquey, Devon, England, TQ27BB
Website: www.sifamtinsley.com/uk
Contact Number: +44(O) 1803 615139
E-mail: info@tinsley.co.uk

The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions.

WARRANTY

Dear Customer,

You are now the privileged owner of ZETA 50/50K/M/R Analog Insulation Tester, a product that ranks the first of its kind in the world. Company provides 12 months warranty from the original date of Purchase against defective material and workmanship. In the unlikely event of failure of the instrument / accessories within the warranty period. Company will repaired the instrument /accessories free of charge. Please hand over the instrument / accessories to the dealer / stockist from whom you have purchased along with this card and relevant Cash Memo / Invoice. This warranty entitles you to bring the instrument / accessories at your cost to the nearest stockist / dealer and collect it after repairs.

NO TRANSPORTATION CHARGES WILL BE REIMBURSED.

The warranty is not valid in following cases:

- 1) Warranty card not duly signed and stamped and original Cash Memo / Invoice is not sent along with meter / accessories.
- 2) Complete warranty card is not presented to authorised person at the time of repairs.
- 3) Meter / accessories is not used as per the instructions in the user manual.
- 4) Defect caused by misuse, negligence, accidents, tampering and Acts of God.
- 5) Improper repairing by any person not authorised by the company.
- 6) Modification, Alteration of any sort is made in electrical circuitry.
- 7) Seal provided inside is broken.

Warranty of ZETA 50/50K/M/R / accessories does not cover Fuses and Battery.

In case of dispute to the validity of the warranty, the decision of Company service center will be final.

If you bought this instrument / accessories directly from the company, and if you notice transit damage, then you must obtain the insurance surveyors report and forward it to Company.

Thank you.

(To be filled by authorised dealer)

Model No. : _____

Sr. No. : _____

Date of Purchase : _____

Cash Memo / Invoice No. : _____

Dealer's / Stockist's Signature : _____

Dealer's / Stockist's Stamp : _____

Scope of Supply:

- 1) ZETA 50/50K/M/R with measurement cable
- 2) Guard Probe
- 3) Carrying case
- 4) 1.5V Rechargeable Battery-6 Nos.
- 5) Operating Instruction
- 6) Warranty Card
- 7) Carrying Strap
- 8) Crocodile Clip
- *9) Power supply cable

*Only with mains model



Manufactured by:

Sifam Tinsley Instrumentation Inc
3105 Creekside Village Dr,
Unit 801, Kennesaw GA 30144

Distributed by:

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Mississauga, ON L4W 3X1

Contact: +1 416-640-5364

Fax: +1 416-981-3933

E-mail: info@veraciousinc.ca

Web: www.veraciousinc.com
