WARRANTY INFORMATION

BAK Precision Corp. warrants to the original purchaser that this product and the component parts thereof will be free from defects in workmanship and materials for a period of one year from the date of purchase.

Contact BAK Precision to receive a repair Return Authorization tracking number. This number must be clearly written on the exterior of the shipping carton and will assist us with the processing of your return. Return all merchandise to BAK Precision Corp. with pre-paid shipping. The fastener repair change includes replacement shipping to locations in North America. For overnight shipments and non-North America shipping fees contact BAK Precision Corp.

To obtain warranty coverage in the U.S.A., this product must be registered by completing and mailing the enclosed warranty card to BAK Precision Corp., 1031 Segovia Circle, Placentia, CA 92870 within fifteen (15) days from proof of purchase.

Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. It is void if the serial number is altered, defaced or removed.

BAK Precision Corp. shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may have other rights, which vary from state to state.

Date Purchased: _____________________________

Warranty Service: Please return the product in the original packaging with proof of purchase to the address below. Clearly state is writing the performance problem and return any connections and accessories that you are using with the device.

Non-Warranty Service: Return the product in the original packaging to the address below. Clearly state is writing the performance problem and return any connections and accessories that you are using with the device. Customers are on their account must be paid in the form of a money order or certified check. For the most current repair charges contact the factory before shipping the product.

Return all merchandise to BAK Precision Corp. with pre-paid shipping. The fastener repair change includes replacement shipping to locations in North America. For overnight shipments and non-North America shipping fees contact BAK Precision Corp.

BAK Precision Corp.
1031 Segovia Circle
Placentia, CA 92870
Phone: 714-577-8230
Facsimile: 714-577-9214

Include with the instrument your complete return shipping address, contact name, phone number and description of problem.
null
OPERATING INSTRUCTIONS

PREAMEASURE CHECKS
1. Before taking measurements, perform a battery check. To check, press TEST switch; POWER LED [Model 307], or BATTERY CHECK [Model 308] should flash briefly. If LED does not flash, or is dim, replace batteries as indicated in MAINTENANCE instructions. Measurements made with low batteries will not meet stated accuracy specifications.

2. Check that the meter is correctly "zeroed" as follows:
   - [Model 307]: Test leads open, pointer should rest on (n) infinity on the high resistance scales. If necessary adjust the mechanical pointer adjustment so the meter pointer sets exactly at the (n) infinity mark. Test leads electrically short with FUNCTION to Q., then press TEST. Pointer should move on exact zero. If meter is not on zero, use an internal adjustment to adjust for electrical zero. When the fuse is blown, replace with a 1.5 A, 250 V fuse; see illustration in MAINTENANCE, BATTERY REPLACEMENT. [Model 308]: Switch FUNCTION to Q, short test leads, press TEST. Display should read 0.0. If not, adjust ZERO G, adjust to zero reading.
   - [Model 307]: Verify that device or circuit to be tested is disconnected from power source (off) and is discharged. If device has a power cord, pull it out from receptacle. After testing is finished, the switch should be "off" if the plug remains connected.
   - [Model 307]: Obtain records of previous tests. Take tests under the same conditions as previous tests. If external conditions change, apply appropriate correction factor to compensate for temperature, humidity, etc.

TEST MEASUREMENTS
Make sure that the circuit under test is turned OFF and disconnected from the input power source. Observe high voltage precautions when taking high resistance (Insulation) measurements. Open circuit voltage depends on the selected range, 100 V, 500 V or 250 V.
1. Plug black reference (Alligator) lead into (c) jack and red high voltage probe into (v) jack.
2. Switch FUNCTION selector to desired MD: range, 1000 V, 500 V, 250 V or 0. As a guide, use the ranges as follows:
   - 1000 V: High resistance measurements of about 20 MG, or more. Typically used for preventative measurements on electrical equipment.
   - 500 V: Measurements of about 100 MG, or more. Primarily used for test insulation that has started to degrade.
   - 250 V: Measurements of about 25 MG, or more.
   - 0: Low resistance continuity type measurements; midscale reading is 2 ohms. Could be used to test insulation or relay contacts or motor-run and start windings.
3. Connect black alligator test lead to common or earth ground side of circuit to be tested.
4. Make good contact point of high red voltage probe to (v) test point in circuit. Be sure to keep your fingers in back of the guard on the probe.
5. Press TEST button, take your reading then release this button for a momentary reading. To take a longer duration reading, press then turn TEST button clockwise to lock. Turn button counterclockwise to release it after reading is taken. Be sure to release TEST button soon after reading is taken to conserve battery power. Voltage generated during test is automatically discharged when button is released.

If the "live circuit" test indicator lights up at this point, do not operate the TEST button. Instead, remove alligator test lead from circuit, then disconnect all power from circuit under test.
INSULATION TEST NOTES

When taking insulation resistance tests for preventive maintenance, start by taking the first measurement when the equipment or circuit is in good condition. Record your results and end the conditions under which these results were taken. Next, set up a schedule for repeating these tests at regular intervals under the same conditions as the initial test. In addition to the condition of the insulation, be ready to consider the following factors: temperature, relative humidity and time duration of the measurement.

Temperature

Most electrical insulation materials have a negative temperature coefficient. That is, insulation resistance decreases as insulation temperature increases. For example, the insulation resistance of a transformer taken at 60 °F may be three times higher than the same insulation taken at 105 °F. As the insulation resistance varies at different temperatures, a correction factor must be applied to the results; typically using 68 °F as the reference base. Request information for the temperature correction factor from the manufacturer of your equipment. The following charts can be used for reference when testing insulation resistances in rotating equipment (claws A) and oil filled transformers.

INSULATION TEST NOTES (continued)

Temperature (continued)

The formula for temperature correction is as follows: Rs = K x Rm, Where Rs is the corrected resistance value, K is the temperature correction factor chart, and Rm is measured resistance value in MQ. For example, insulation readings in rotating equipment, 100 MQ at a temperature of 110 °F: Rs = 6 x 100 = 600 MQ.

Relative Humidity

Measurements taken in a humid environment will be lower than similar measurements taken in a dry environment. The physical characteristics of the equipment affect measurements. For example, rotating machines have more leakage paths; commutators and armatures can trap more moisture than a sealed transformer or shied cable.

Time Duration of Measurements

The factor affecting insulation resistance is often overlooked. Typically, if the insulation is good, the measured value of resistance holds steady.

Insulation Resistance Test

Resistivity Condition Note

High, holds steady Good to very good.
High, then drops down Questionable, possible start of breakdown.
Modestly low but steady May be good, depends on past records. Try to find cause of low reading.
Low, then stays down Possible failure soon, repair or replace.

Hermetic Compressor

Resistance Values Condition Note

100 megohms and greater Good to very good.
50 to 100 megohms Moisture in refrigerant slightly high, check drier.
25 to 50 megohms Moisture in refrigerant too high, check system.
Below 20 megohms System failure likely, repair or replace.

TEST CONNECTIONS

Warning

Before connecting this tester to a circuit or equipment, make sure input power is removed - disconnected. Only carry out tests with the power off and circuit discharged to avoid the possibility of serious personal injury from electrical shock.

AC Motors & Generators: To carry out a basic insulation test on an ac motor or generator, connect the black alligator clip lead to the frame or housing and connect the red alligator clip to probe one of the motor terminals, or wire.

To test the start and run windings, switch the FUNCTION selector to Q, low resistance. Next, connect the black alligator lead to the common terminal and connect the red high voltage probe to the start or run terminal.

DC Motors & Generators

DC motors or generators can be checked with an overall insulation test, or the electrical connections can be tested separately. When making an overall test, the brushes remain in contact with the commutator for a complete path between all electrical parts. For this reason an insulation tester between the frame and one of the windings. When making a check of the separate sections, isolate the brushes from the commutator. Test individual electrical sections using procedures similar to those indicated for the start-run windings of ac motors.

Hermetic Compressors:

Many compressors use one or two terminal blocks labeled C, S, and M. To verify your electrical arrangement, see the literature provided by your manufacturer.

To measure insulation resistance at S, M, and C type terminal block, connect the black alligator clip lead to the frame or ground. Contact the red high voltage probe to the C terminal before taking a measurement. To check the start and run windings, switch FUNCTION to Q, low resistance and check between the C and S or M terminals.

OPERATING INSTRUCTIONS

Cables

Disconnect cable from line and also from its related equipment. As an added safety precaution, disconnect it before the individual leads to the sheath. This procedure is especially important when testing coaxial cables.

Several measurements can be made; lead-to-lead, lead-to-ground, lead-to-ground, etc. To test an individual in a multiconductor cable, leave the lead line short and shut all other leads to the shield. Connect the alligator clip lead to the shield and connect red high voltage probe to the free lead before taking a measurement. Once all remaining leads using this procedure.

Circuit Breakers, Starters and Switches

In addition to verifying that your device is disconnected from the input line, make sure the instrument is used in an approved installation and that you are acquainted with the condition of your device. If you use signs of arcing, pitted contacts, leakage paths across the insulators, etc., replace the device, as these conditions may cause low resistance insulation readings. To test these devices, connect one lead of your tester to one of the poles and the other lead to the remaining pole or pole.

MAINTENANCE

ELECTRICAL ZERO ADJUSTMENT (Model 307)

Do not touch PC board to avoid a severe shock.

Only follow these procedures if your printer is not on zero when you made the PREMEASUREMENT CHECKS for the Model 307.

1. Remove the four corner Phillips screws from the back of the meter.

2. Rock meter subassembly (front) gently as you pull out to remove from main casing. Take care to avoid breaking the leads by pulling out subassembly too far.

3. Note the two access holes below the meter cutout opening in the PC board. Insert a small blade-screw driver into the middle hole to adjust the printer to zero with the test leads shorted.

4. Reverse steps (3) through (1) to reassemble subassembly.

WARNING

PC BOARD ADJUST

NOTE: VIEW OF PC BOARD