Bierer METERS
Safety is number one.

83280

Voltage Detector and Phasing Tester 300V-35kV

Operating Instructions CE

MADE IN USA

CONTENTS

Limitation of Warranty and Liability

Bierer & Associates Inc. warrants this product to be free from defects in workmanship and material, under normal use and service conditions for a period of one year from date of shipment.

Due to continuous product improvement and development, Bierer & Associates Inc. reserves the right to modify product designs and specifications without notice.

It is impossible to eliminate all risks associated with the use of high voltage electrical devices including this device. Risks of serious injury or death are inherent in working around energized electrical systems. Such risks include but are not limited to variations of electrical systems and equipment, manner of use or applications, weather and environmental conditions, operator mentality, and other unknown factors that are beyond the control of Bierer & Associates Inc.

Bierer & Associates Inc. do not express or imply to be an insurer of these risks, and by purchasing or using this product you **AGREE TO ACCEPT THESE RISKS.** IN NO EVENT SHALL Bierer & Associates Inc. BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

SAFETY MESSAGE DEFINITIONS per ANSI Z535

These instructions contain important safety messages to alert the user to potentially hazardous situations, how to avoid the hazard, and the consequences of failure to follow the instruction.

The safety alert symbol  identifies a safety message. The signal word following the symbol indicates:

 **DANGER** A hazardous situation which, if not avoided, **will** result in death or serious injury and equipment damage.

 **WARNING** A hazardous situation which, if not avoided, c**ould** result in death or serious injury and equipment damage.

 **CAUTION** A hazardous situation which, if not avoided, **could** result in minor or moderate injury and equipment damage.

NOTICE Important safety message relating to equipment damage only.

PRODUCT SAFETY INFORMATION

WARNING

1. Meter assembly, interconnect cable assembly, and live line tool adapters shall be considered **non-insulating**. Do not let live line tool fittings come in contact with energized or grounded conductors. **The live line tool adapters, fittings, and handles supplied with meters shall not be used on any other devices.**
2. Use appropriate length live line tools for voltage being worked and maintain minimum approach distances as outlined in OSHA 1910.269, Table R-6.
3. All Phasing Meters and Voltage Detectors manufactured during and after 2007 will have a limit mark engraved on the high voltage probe(s) 2.5 inches from the tip to indicate to the user the physical limit that should not be exceeded when approaching and contacting an electrical conductor or other electrical test points. Zero Ohm insulated adapters (81280IE) should be used if limit mark will be exceeded.
4. This equipment should be used only by qualified employees, trained in and familiar with the safety-related work practices, safety rules and other safety requirements associated with the use of this type of equipment.
5. These instructions are not intended as a substitute for adequate training, nor do they cover all details or situations which could be encountered when operating this type of equipment.
6. Before operating this equipment, read, understand and follow all instructions contained in this manual. Keep instructions with equipment.

INSPECTION & MAINTENANCE BEFORE USE

WARNING

1. Prior to using any high voltage test equipment a careful inspection should be made to ensure the unit is free from any contaminants such as dirt, grease, etc. and that there are no apparent physical damages.
2. High voltage probe assemblies shall be wiped clean prior to each use with a silicone impregnated cloth and kept clean and free of contaminants. This will prevent tracking on the outside of the probe and meter error.
3. Always confirm internal battery voltage before and after each use.
4. Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications

The Voltage Detector and Phasing Tester:

⚠WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

1. For voltage sensing and phasing on overhead and underground systems.
2. For voltage sensing and phasing at capacitive test points.
3. Five-position switch selects function:

C Voltage sensing on capacitive test points

CP Phasing between capacitive test points

L Voltage sensing on overhead and underground systems

LP Phasing on overhead and underground systems

BT Internal battery test.

4. Bushing and elbow adapters for URD use.
5. Adapters are available for use with live line tools:

- **Q** Quick Change – Standard on both probes
- **UGA** Universal/Grip All Combination – Adapters for use with hot-sticks or shotgun sticks. PN: PA165UGA

6. A second probe and series lead is furnished for use when phasing or measuring line-to-line or line-to-ground voltages.
7. The carrying case incorporates a 3 kV test device for testing the instrument for correct operation before and after each us

BATTERY TEST

The battery test tells the operator whether the meter probe's internal battery is fully charged.

1. Turn the selector switch on the back of the meter to position BT (Battery Test) and hold to the right. The meter should show a full scale deflection. If there is less than full deflection, the meter probe battery should be changed.

2. (If the battery test fails, you can replace the 9 volt battery located behind the attachment point for the hot stick located on the main meter face.)

⚠WARNING

- See "Product Safety Information", page 3.
- See "Inspection & Maintenance", page 3.

SENSING ON CAPACITIVE TEST POINTS

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the Selector switch to position C (Capacitive Sensing).

3. Fasten the meter probe to appropriate live line tool.

4. Turn on the test device.

5. To test the meter probe on the test device (provided in the carrying case), depress the button on the test device with the meter probe end. **The meter should show a half scale deflection minimum**

6. Test the meter probe on the capacitive test point.
   A. No meter deflection indicates de-energized source.
   B. Any meter deflection indicates voltage present.

7. Retest meter on test device to confirm that it is working.

⚠WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

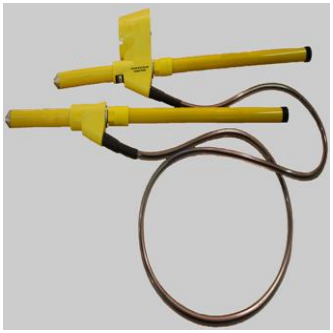
⚠WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

PHASING ON CAPACITIVE TEST POINT

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the Selector switch to position CP (Capacitive Phasing).



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. Place the meter probe end to a capacitive test point

8. Have the second probe make contact with the meter probe end on the capacitive test point. The test point meter probe should show a **Zero** reading.

9. Leave the meter probe on the capacitive test point to the first elbow and contact the second probe on another capacitive test point.

A. **In Phase** is represented by no meter reading or deflection.

B. **Out of Phase** is represented by a meter reading or deflection.

⚠WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

⚠WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

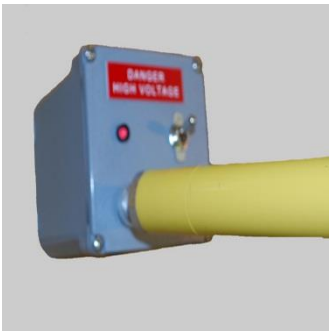
SENSING ON DIRECT LINE

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the Selector Switch to position L

3. Fasten the meter to appropriate live line tool

4. Turn on the test device



5. To test the meter probe on the test device provided in the carrying case, depress the button on the test device with the meter probe end. **The meter should show at least a 2.5 kV deflection.** If not, check all batteries or send for repair.

6. Make the test on the electrical circuit conductor, then retest unit on the test device
    A. Meter deflection indicates voltage present.
    B. No deflection means line is de-energized

⚠WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

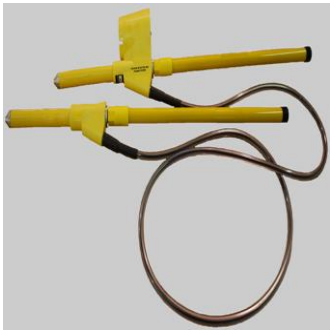
⚠WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

PHASING ON DIRECT LINES

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the Selector switch to position LP (Line Phasing).



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. Place the meter probe end on one of the conductors.

8. Have the second probe make contact with the meter probe end on the same conductor. Again, the probe meter should show a **Zero** reading

9. Leave the meter probe on the first conductor and contact the second probe on another conductor. If the conductors are in phase, the meter should show a **Zero** reading.
   A. **In Phase** is represented by no meter reading or deflection.
   B. **Out of Phase** is represented by a meter reading or deflection

⚠ WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

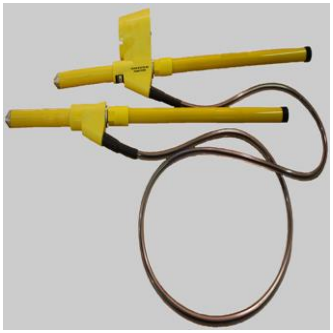
⚠ WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

LINE-TO-LINE AND LINE-TO-GROUND VOLTAGE

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the selector switch to position **LP** (Line Phasing)



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. To measure line-to-line voltage, use the meter probe, series lead, and second probe combination to make contact between lines and take a reading. To measure voltage line-to-ground, use the meter probe, interconnect cable and second probe combination to make contact between the line and ground and take a reading

⚠ WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

⚠ WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

VOLTAGE CHECK OR INDICATION, URD

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the Selector Switch to position L

3. Fasten the meter to appropriate live line tool

4. Turn on the test device

5. Attach URD bushing adapter to meter probe.

6. If line voltage is present, meter will indicate approximate line to ground voltage

7. If line voltage is not present, there will be no meter reading or deflection.

WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

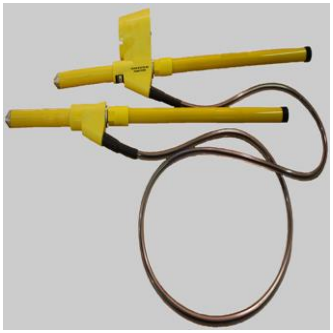
WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

PHASE-TO-GROUND VOLTAGE CHECK, URD

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the selector switch to position **LP** (Line Phasing)



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. Attach URD bushing adapter to meter probe.

8. Plug meter probe with URD bushing adapter into desired bushing. Touch second probe to good electrical ground connection.

A. If line voltage is present, meter will indicate nominal phase to ground voltage.

B. If no line voltage is present, there will be no meter reading or deflection.

WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

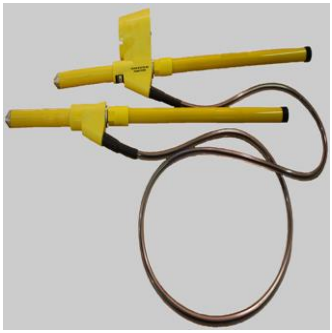
WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

PHASE-TO-PHASE VOLTAGE CHECK, URD

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the selector switch to position **LP** (Line Phasing)



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. Attach URD bushing adapter to meter probe and second probe.

8. Plug meter probe with URD bushing adapter and second probe with URD bushing adapter into bushings to be tested.

A. If line voltage is present, meter will indicate nominal phase to ground voltage.

B. If no line voltage is present, there will be no meter reading or deflection.

WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

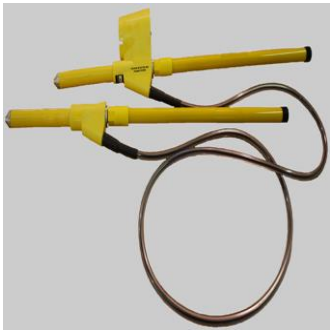
WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

URD PHASING

1. Perform the Battery test as prescribed in the “BATTERY TEST” section on page 5.

2. Turn the selector switch to position **LP** (Line Phasing)



3. Connect the meter probe to the second probe with the interconnect cable.

4. Turn on the test device.

5. To test the meter probe on the test device provided, depress the button of the test device with the meter probe and place the second probe end on the other terminal. **The meter should show a reading of at least 2.5kV.** If not, check all batteries or send for repair.

6. While depressing the button with the meter probe, have the second probe make contact with the meter probe end. The meter probe should show a **near or zero** reading.

7. Attach URD bushing adapter to meter probe and second probe.

8. Attach both URD bushing adapters to probes. Test for phase-to-ground voltage on bushings to be phased. Nominal phase-to-ground voltage should be present on both bushings before phasing

9. Plug meter probe with URD bushing adapter and second probe with URD bushing adapter into bushings to be phased.

A. Out of Phase is represented by a meter reading or deflection.

B. In Phase is represented by near zero meter reading or deflection.

⚠WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

⚠WARNING

Unit shall be tested before and after each use on a known voltage source. Failure to do so could result in false negative indications.

URD CABLE DC LEAKAGE TESTER “Hi-Potting”

⚠ WARNING

- See “Product Safety Information”, page 3.
- See “Inspection & Maintenance”, page 3.

Testing DC Hi Pot Adapter

1. Attach voltmeter to appropriate length live line tools for the voltage being worked. Select the LP position.

2. Attach Hi-Pot Adapter to the meter probe. Place second probe on a suitable ground and make contact with DC Hi-Pot to source voltage.

3. Meter should read approximately 70% of the line-to-ground source voltage. See note 2.

NOTE 1: The section of cable under test must be isolated on both ends and cannot be connected to/or through equipment or lighting arrestors. To achieve most accurate readings, use the standard 8ft. cable only and keep the cable away from ground(s) or energized sources.

NOTE 2: The maximum voltage reading during the hi-potting test is approximately 70% of the line-to-ground source voltage, i.e. 7.2kV X .70 = 5kV. This value is representative of a direct fault on the cable. Readings near zero represent a good cable with little or no cable leakage.

NOTE 3: It is the responsibility of each user to determine the maximum acceptable leakage value, based on prior testing and work experience.

Testing Riser Pole to First Transformer

1. Following standard operating procedures, isolate both ends of the cable to be tested using a feed thru bushing at transformer, see NOTE 1.

2. Attach voltmeter to appropriate length live line tools for the voltage being worked. Turn the selector switch to the LP position on the meter probe.

3. Attach the DC Hi-Pot adapter, w/ hook adapter, to Meter probe.

4. Attach straight adapter to Second probe.

5. Place Hi-Pot adapter on source voltage and second probe on cable termination. SEE NOTE 2.

6. On a non-faulted cable the meter will read at or near maximum calculated voltage and diminish to near zero volts as the cable charges. SEE NOTE 3.

7. On a faulted cable the meter will read at or near maximum calculated voltage and stay there. SEE NOTE 3.

8. A pulsating meter reading indicates the presence of an internal flashover.

9. Discharge cable to ground after each test; see DISCHARGING CABLE, page 31.

NOTE 1: The section of cable under test must be isolated on both ends and cannot be connected to/or through equipment or lighting arrestors. To achieve most accurate readings, use the standard 8ft. cable only and keep the cable away from ground(s) or energized sources.

NOTE 2: The maximum voltage reading during the hi-potting test is approximately 70% of the line-to-ground source voltage, i.e. 7.2kV X .70 = 5kV. This value is representative of a direct fault on the cable. Readings near zero represent a good cable with little or no cable leakage.

NOTE 3: It is the responsibility of each user to determine the maximum acceptable leakage value, based on prior testing and work experience.

Testing Between Transformers

1. Following standard operating procedures, isolate both ends of the cable under test using feed thru bushings, see NOTE 1.

2. Attach voltmeter to appropriate length live line tools for the voltage being worked. Turn the selector switch to the LP position on the meter probe.

3. Attach the DC Hi-Pot adapter, w/ bushing adapter to Meter probe.

4. Attach bushing adapter to Second probe.

5. Insert the Hi-Pot adapter in energized bushing of transformer and second probe in open feed thru bushing isolating cable under test. SEE NOTE 2.

6. On a non-faulted cable the meter will read at or near maximum calculated voltage and diminish to near zero volts. SEE NOTE 3.

7. On a faulted cable the meter will read at or near maximum calculated voltage and stay there. SEE NOTE 3.

8. A pulsating meter reading indicates arcing or flashover.

9. Discharge cable to ground after each test; see DISCHARGING CABLE below.

NOTE 1: The section of cable under test must be isolated on both ends and cannot be connected to/or through equipment or lighting arrestors. To achieve most accurate readings, use the standard 8ft. cable only and keep the cable away from ground(s) or energized sources.

NOTE 2: The maximum voltage reading during the hi-potting test is approximately 70% of the line-to-ground source voltage, i.e. 7.2kV X .70 = 5kV. This value is representative of a direct fault on the cable. Readings near zero represent a good cable with little or no cable leakage.

NOTE 3: It is the responsibility of each user to determine the maximum acceptable leakage value, based on prior testing and work experience.

DISCHARGING CABLE

⚠WARNING

- Failure to discharge cable could result in death or serious injury, equipment damage, and/or false readings.

Cable that has been tested must be discharged to a proper ground source after each test.

1. Contact tested cable with the meter probe/Hi Pot adapter

2. Contact suitable ground with second probe

3. Time to discharge should equal charge time. Meter will read near zero when fully discharged.

PARTS & ACCESSORIES

PART NO.	DESCRIPTION
3402	Quick Change to Grip All Adapter
3403	Quick Change to Universal Adapter
8128EALB	15 – 25kV Elbow Adapter
8128TBALB	15 - 25kV Bushing Adapter
81280FL	8 Foot Lead with Female Adapter
81280ML	8 Foot Lead with Male Adapter
81280ML16	16 Foot Lead with Male Adapter
81280ML30	30 Foot Lead with Male Adapter
81280ML40	40 Foot Lead with Male Adapter
81280LHM	Hook Adapter
81280LPM	Straight Probe Adapter
81280B1	6V Battery for Power Supply
PA25B	20” Storage Box with Foam
PA25T	3kV Power Supply
PAH6TB	26" Storage Box for Handles
PD50B	26" Storage Box with Foam

Bierer METERS
Safety is number one.

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NOTES


Bierer
METERS
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Thank You!