



PD800W CORDLESS PHASING TESTER



OVERVIEW

- Theory of Operation & Principles
- Introduction to the PD800W
- Equipment Overview/Specifications
- Procedures
- Features

Theory of Operation & Principle

- In the “DEG” switch position, the PD800W compares the Phase Angle between the Reference Probe and the Meter Probe in Real-Time.
- The resultant between the two measurements is displayed as a numerical number in Degrees on the Meter Probe and as LED lights (White, Blue, Red) below the number.
- In the “URD” (Underground Residential Distribution) or “OH” (Overhead) switch position, the PD800W compares the Phase Angle between the Reference Probe and the Meter Probe in Real-Time and simultaneously displays a nominal voltage relationship (Phase-to-Phase) as well as the LED lights (White, Blue, Red) below the number.

Equipment Overview

Meter Probe



Five Position Switch

Delta/Wye Light

240 Degree Light

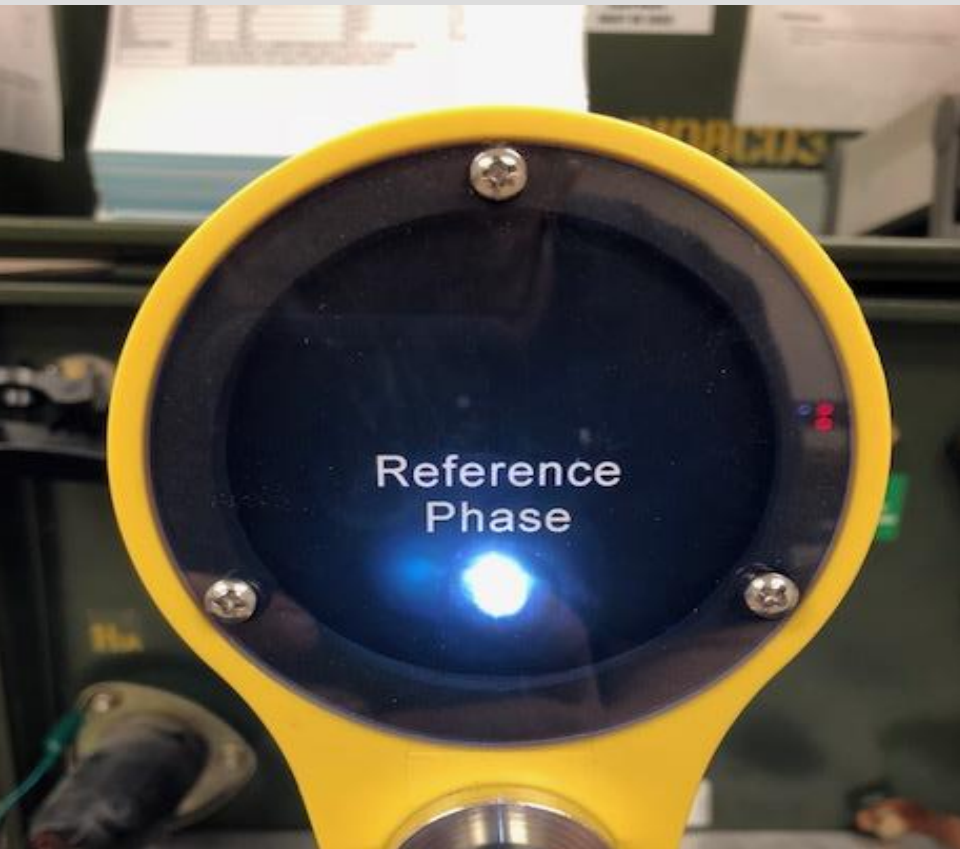
120 Degree Light

0 Degree Light

Phase Angle Display

Equipment Overview

Reference Probe



Five Position Switch

- The White LED on the Reference Probe will be "ON" if the voltage or electrical field is equal to or greater than the threshold values below:

DEG Switch Position	30VAC
URD or OH Switch Position	Approx. 300VAC

Equipment Overview

Selector Switch Position and Function

- **“OFF”** – Unit is off for storage or transit.
- **“DEG”** – For Phase Angle measurements (all traditional phasing applications) between the Meter Probe and Reference Probe on 3-Phase Secondary, URD, Overhead/Transmission systems. Make direct contact from capacitive test points to 69kV Phase-to-Ground. Non-Contact (minimum approach distances) for any voltages above 69kV Phase-to-Ground.
- **“URD”** – For nominal voltage readings in URD systems or applications 10ft. or less above Earth. Direct contact from 4kV to 51kV, not for use on capacitive test points.
- **“OH”** – For nominal voltage readings in Overhead systems or applications 20ft or higher above Earth. Direct contact from 4kV to 51kV.
- **“TEST”** – Performs an internal self-test (displays “510”), also displays approximate internal battery voltage, i.e. 080 = 8VDC.

Equipment Overview

Meter Probe Phase Lights Indications

Note: The Meter Probe colored lenses (White, Blue, Red) can be manually moved or swapped with other lenses to display or coordinate the color sequence per the Utilities preference.

Example:

Instead of a White, Blue, Red (OEM) sequence, a Utility can make the sequence Blue, White, Red or Red, White, Blue, etc.

- **0°** – Indicates an In-Phase condition
- **120°** – Indicates an Out-of-Phase condition of 120°.
- **240°** – Indicates an Out-of-Phase condition of 240°.
- **D/Y** – Indicates a Delta/Wye transformation, i.e. +/-20° phase shift in conjunction with one of the other three phase LED lights.

Procedures

- (Continued) Step #7, if the Meter Probe reading is not one of or near the nominal 3-Phase readings, i.e. 0° , 120° , 240° and some multiple of 30° as demonstrated in the image below right, then the Reference and Meter Probe is phasing across a Delta/Wye transformation.
- A blinking Yellow “D/Y” light indicates a Delta/Wye transformation (multiple of 30° phase shift) in conjunction with one of the other phase indicator lights.
- **Note:** The White Light on the Reference Probe will always be on if the unit sees at least 30VAC, in direct contact or electrical field. The White Light must be present to ensure proper operation of the PD800W.



The D/Y yellow LED activates if the phase angle deviates $\pm 20^\circ$ from any one of the three nominal readings



Procedures

8. With both Probes still in the DEG switch positions, test phase sequence.

Note: Phase sequence is the order in which the voltages of a three phase system rise and fall. Only two sequences are possible, normally referred to as a “Positive” and “Negative” sequence, or a “Clockwise” and “Counter-Clockwise” sequence.

- However, there are three different physical connections as demonstrated on the following page, to achieve each sequence. Any one of the phases of a three phase system may be assigned the status of “Leading” phase. This convention is currently left up to the discretion of the electric utility.

Procedures

Testing Phase Sequence

DEG Switch Position

- Sequence (A-B-C)(1-2-3)
 - **A-B-C** **A-B-C-A-B-C-A-B-C**
 - **B-C-A** **B-C-A-B-C-A-B-C-A**
 - **C-A-B** **C-A-B-C-A-B-C-A-B**
- Sequence (C-B-A)(3-2-1)
 - **C-B-A** **C-B-A-C-B-A-C-B-A**
 - **B-A-C** **B-A-C-B-A-C-B-C-A**
 - **A-C-B** **A-C-B-A-C-B-A-C-B**

Procedures

Testing Phase Sequence

DEG Switch Position

9. With both Probes still in the DEG switch positions, test for phase sequence while using Step #7 criteria.
 - Touch or approach **A**(1) phase with the Reference probe
 - Touch or approach **B**(2) phase with the Meter probe
 - Sequence (A-B-C)(1-2-3) will be indicated by a nominal 120° and the **Blue** LED will be on
 - Sequence (C-B-A)(3-2-1) will be indicated by a nominal 240° and the **Red** LED will be on

Procedures

Capacitive Coupling Effect

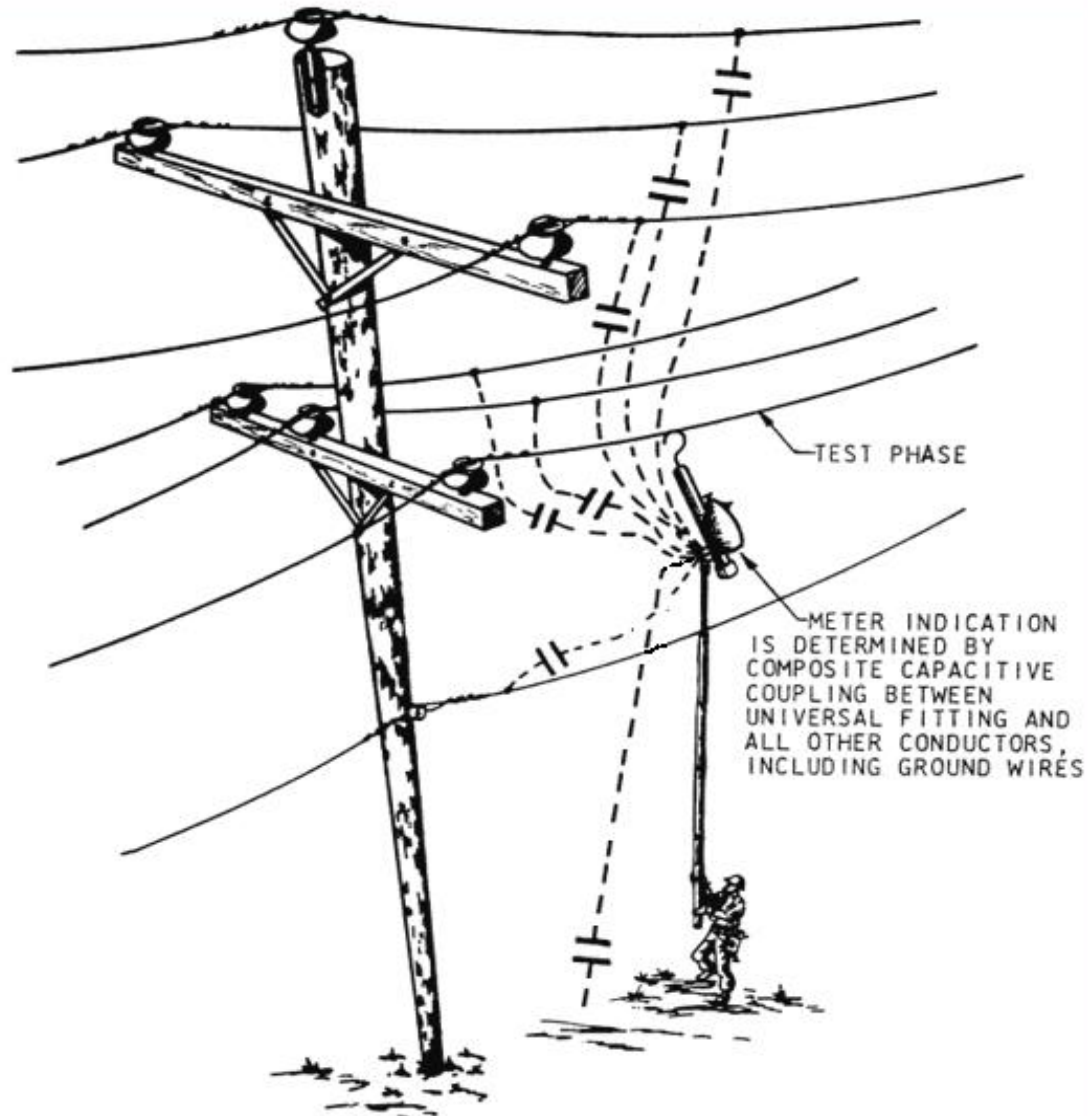


FIGURE 3. CAPACITIVE COUPLING PRODUCES METER RESPONSE

Procedures

Phase-to-Phase Out-of-Phase Voltage Reading Direct Contact **URD** and **OH** – 4kV-to-69kV

- Obtained by touching one phase conductor with the Reference Probe and another phase conductor with the Meter Probe



Procedures

Phase-to-Phase In-Phase Voltage Reading
Direct Contact **URD** and **OH** – 4kV-to-69kV

- Obtained by touching the Reference Probe and Meter Probe to conductors of the same phase



Procedures

Phase-to-Ground Reading

Direct Contact **URD** and **OH** - 4kV-to-69kV

- Meter Probe or Reference Probe may be used as a stand alone direct contact digital Voltage Detector.
 - When using the Meter Probe in this manner the Reference Probe must be switched off.
 - When using the Reference Probe in this manner, the nominal voltage will be displayed on the Meter Probe.
- Note:** Make sure both probes are in the same selector switch position.



Procedures

Reference Probe as a Voltage Detector

Direct Contact **Deg, URD & OH** – 120V-to-69kV

- Obtain reading by touching the energized conductor or capacitive test point. The **White** LED will be on if the voltage is equal to or greater than the threshold values below:
 - a) **Deg** position 30V
 - b) **URD** or **OH** Approx. 350V

Features

PD800W

CORDLESS PHASING TESTER

- Saves Money – Less Time
- Improves User Safety – No interconnect cable required
- Multi-Function 4 Meters in one:
 1. Phasing Tool
 2. Phase Sequence Indicator
 3. Phase Angle Indicator
 4. Voltage Detector
- Wide Operating Voltage Range:
 - 120V-to-800kV

Features

PD800W

CORDLESS PHASING TESTER

- Application Flexibility in the Field
- Allows Uniformity of Equipment In The Field, Transmission, Substation, Distribution
- Requires No Ranging, Multipliers or Extension Resistors, Universally Phases on Any System; Including Capacitive Test Points