

# WE-30

*Three-Phase Field Testing*

## Portable Three-Phase Meter Tester/Analyzer



*Accuracy - Convenience - Versatility*

**R A D I A N**  
**WECO**  
Power and Energy Measurement Solutions

# Portable Three-Phase Meter Tester/Analyzer

## WE-30

WECO's next generation Portable Tester/Analyzer delivers three-phase field-testing using a Radian Research RD-30 series internal standard complemented by a sophisticated, lightweight package. The WE-30 allows you to execute a multitude of tests at the customer's site. You can test the meter with the customer's load, perform CT burden and ratio tests, and verify system wiring to give you the peace of mind that the entire metering installation is correct. Harmonic Analysis, CT Testing, Vectors, and Trends can all be tested without pulling the meter from its socket.



Using the WE-30 is a familiar process due to the Microsoft™ Windows® 7, 64-bit operating system embedded within the unit. Large internal storage allows for numerous test results, as well as custom site configuration and test sequences to be saved locally on the WE-30. The convenient touch screen interface allows instant access to the Winboard Embedded application without the need for an external keyboard, mouse, or monitor. These, however, can be easily connected to the WE-30, providing you with additional options.

The WE-30 feature-rich software, designed with user-friendly screens, lead you through installation, wiring checks, testing, and record keeping. Various test profiles, sequences and site configurations may be created and saved. Test results are fully compatible with WECO's industry specific WATT-Net Plus™ data management software, providing centralized record keeping with data editing and report generation. Globally update test profiles on multiple units through an Ethernet based network or the Internet. Data can be exported as Microsoft™ Excel, user-defined, or PDF files.

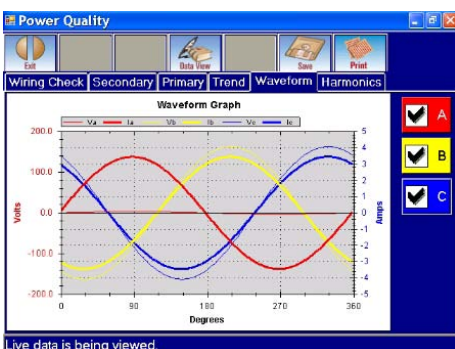
The WE-30 can perform a complete site analysis which includes Power Quality, Meter Testing, and Transformer Testing. Power Quality performs a Wiring Check to verify correct service wiring. If improper wiring is detected, the operator is prompted to correct the wiring before testing will start. A Vector diagram gives a visual representation of the phase relationships. Primary and Secondary metrics and waveforms along with Harmonic content are displayed in real-time. Analyze Harmonics



through the 60th order providing total harmonic distortion with the amplitude and phase of each Harmonic. Meter Testing allows for either sourced voltage and current or the customer's load for verifying meter accuracy. Transformer Testing provides burden and ratio accuracy measurement for both current and potential transformers.



The WE-30 comes with fuseless voltage and current sources that self-protect against short-circuit, thermal, and over-current fault conditions. These internal sources provide six drive channels allowing independent waveforms for voltage and current on all three phases. Harmonic waveforms can be recorded in the field or manually created to be played back by the WE-30. Recorded Harmonic waveforms can also be played back on the Model 4000 series testboards. Whether sinusoidal or distorted, both types of waveforms are solely under the user's control, and the test parameters can be repeated in the field or back at the shop. Using the WE-30, the meter can be completely tested and analyzed for a wide range of repeatable test conditions.



The WE-30 ships with a powerful Radian Research three-phase reference standard, the RD-30, which boasts a 0.04% accuracy margin of error. If your utility demands higher levels of accuracy, then you may upgrade to a Radian Research RD-31 (0.02% accuracy) or the RD-33 (0.01% accuracy). These NIST traceable reference standards

ensure a true meter accuracy test is being performed. Accuracy verification of the reference standard can automatically be performed using the WE-30 Standards Compare Routine allowing easy comparison to an external master standard.

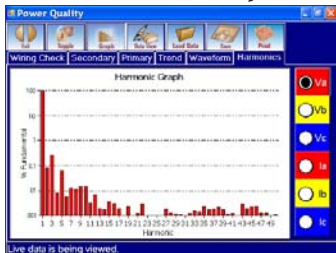
## The WE-30 packs a lot of features into a small package:

### Meter Testing



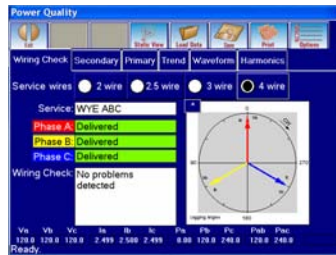
Meter Testing with the WE-30 allows you to really put a meter through its paces. Test any combination of elements, phases and test types with the selection of a predefined test sequence. Results are clearly displayed in an easy to read table. The user is alerted to tests that fall outside of a specified accuracy range by results that are clearly labeled in red.

### Harmonic Analysis



The system's powerful Harmonic Analysis feature displays harmonic data (both RMS and percent of fundamental) for all three phases up to the 60th harmonic as a bar graph or raw numbers.

### Wiring Check



Wiring Check allows you to verify the service at a site and get valuable information about the service type, voltages, currents and phase angles. Wiring Check will also alert you to potential problems with the service.

### Waveform Analysis



Waveform analysis gives you the ability to view voltage and current waveform graphs for all three phases. You can view a real time waveform graph for any combination of phases. The interactive graph allows you to zoom in and out as well as retrieve exact numerical measurements by clicking on any point.

### Transducer Testing



The WE-30 is capable of testing transducers with outputs between +/-20mA.

### Site Information



Site Information allows you to set up and recall specific information on the devices at a test site such as meters, current transformers and potential transformers. This method of data management keeps you from having to enter information while out in the field. If data is changed in the field the WE-30 updates the site information database so it's saved for the next time you test the site.

### Secondary Check



### Primary Check



Retrieve data on the calculated electrical quantities for transformer secondaries and primaries of the meter installation with the WE-30's Secondary and Primary Checks. Everything from Volts to VARS is measured, in real time, across all three phases for each check. Results are clearly displayed in a color-coded table and can be changed from real time to a snapshot with the click of the stylus.

Test results are fully compatible with WECO's industry specific meter shop asset management software, WATT-Net Plus™, providing centralized record keeping with data editing and report generation.



## Standard Accessories

### Nylon Carry Bag

(MW0081XX)

The WE-30's Nylon Carry Bag gives meter testers the ability to grab-and-go. With ample storage room for all of the cables and leads that come standard with the WE-30, the Nylon Carry Bag is both convenient and portable.



### Field Power Cord

(BW0016XX)

Each WE-30 ships with a Field Power Cord that allows you to conveniently and safely power the unit at the site.



### Shop Power Cord

(BW0046XX)

Back at the shop, the AC Shop Power Cord provides a convenient way to power your WE-30 from a standard 120VAC power outlet.



### Current Isolators

(CH001003)

The WE-30 ships with a set of six Current Isolators that are portable, durable, and provide great current isolation between test switches.



### Current Cable Set with Alligator Clips

(BW0032XX)

The current cable set with alligator clips allows you to connect the WE-30 to the current switches on a meter test switch. Once connected the WE-30 can control the current applied to any transformer rated meter. This set includes three color-coded (red, yellow, blue) 8' cables.



### Field Safety Ground Cable

(BW0066XX)

The Field Safety Ground Cable allows you to test with the confidence that both you and your equipment are protected.



### Ethernet Cross-Over Cable

(CE000040)

With the supplied Ethernet Cross-Over Cable, it is a cinch to directly connect the WE-30 to an external laptop for control of the unit without having to connect it to a network.



### Current Cable Set with Safe-T-Plugs

(BW0013XX)

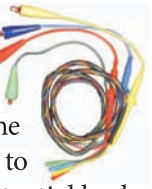
The current cable set with Saf-T-Plugs connects the WE-30 to the test switch allowing you to read the secondary current of the transformer as well as burden test the current circuit. This set includes three color-coded (red, yellow, blue) 8' cables. This cable set also includes a safety restraint device that prevents inadvertent opening of the current transformer secondary.



### Potential Cable Assembly

(BW0012XX)

Plug your WE-30 right into the meter test switch and take control of the amount of potential applied to the meter. Our standard potential leads are 8' long with alligator clips and are designed for safety and durability. 1000V, 550mA fuses located at the ends provide for hazard protection for the operator. 3 spare fuses are included with the unit.



## Optional Accessories

### OPTOCOM™ Optics

(AW0005XX)

Increase the versatility of your field testing with WECO's OPTOCOM™ option. Attach the optic coupler head to properly equipped solid state meter and forget about alignment. When the test is complete you can program the meter right at the site without having to change out optic heads.



### Magnetic Mount Reflect and Solid State Optics

(AW0040XX)

This option combines both reflect optics for mechanical meters and pulse detecting optics for solid state meters into one handy tool. Attach this optics solution with the flip of a switch to any can-mounted meter. The LED indicators and mode selection make testing a snap.



### Solid State Optics Probe Assembly, Suction Cup, IR Detector

(AW0006XX)

When you're faced with a meter enclosure that doesn't accommodate magnetic or clamp based optics you can turn to WECO's Solid State IR Optics Probe Assembly with suction cup attachment to detect the meter's IR emitter.



### Solid State Optics Probe Assembly, Suction Cup, Visible Detector

(AW0007XX)

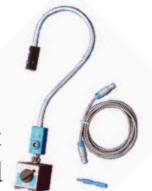
Don't let enclosures that prevent magnetic or clamp based optics attachment keep you from getting quick test results. WECO offers the Visible Detector Solid State Optics with Suction Cup attachment to make sure you can test meters equipped with visible LEDs.



### Magnetic Mount Optics

(AC0015XX)

With just the flip of a switch you can easily attach the Magnetic Mount Optics to any can-mounted meter. It's ideal for substation installations. Increase the number of meters you can test using either reflect or pulse modes by cutting down on optics attachment time. The powerful magnet holds to the meter can under any circumstance. A 6' foot cable comes standard with the optional Magnetic Mount Optics.



### Radian RM-DS Meter Disk Sensor Power Cable

(AW0020XX)

This adapter cable allows the use of Radian's RM-DS meter disk sensor with the WE-30.



## Optional Accessories Continued

### Click Switch Adapter

(AW0008XX) Sometimes optics just are not an option, and that's when you turn to WECO's Click Switch Adapter. Visually observe the disk's rotation and manually register revolutions with the click of a button.



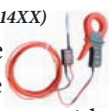
### 100A Clamp On Probe

(AW0013XX) The "clothespin" style current probe is most often used for secondary current measurements from 400mA to 100A, 600V maximum.



### 1000A Clamp On Probe

(AW0014XX) The circular clamp-on probe is used for primary and some secondary current measurements with a range of 2.5A to 1000A for conductors up to 2.25" maximum.



### 20 Amp .47" Jaw Transformer Rated Probe Kit, 5' Leads

(AW0027XX) This small, compact probe with a .47" jaw opening is used to measure currents from 40mA to 20A.



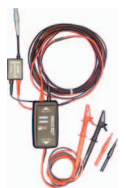
### AmpFlex<sup>®</sup> Current Probe Kit

(AW0010XX - 1000A) (AW0026XX - 3000A) The AmpFlex<sup>®</sup> Current Probe Kit includes a flexible current sensor for measurements on conductors where standard clamp-on probes cannot be used. The 36" sensor with electronic module and a calibration adapter can measure up to 1000 or 3000 amps.



### 600V PT Probe

(AW0023XX) The 600V PT Probe allows you to check the voltage on systems that are 600 volts and less, allowing you to verify the potential transformer is working correctly.



### Voltage And Current Leads Extension Kit, 12'

(AW0021XX) This extension kit increases the distance from the WE-30 to your test switch by 12'. It supports up to 600V and 15A per phase.



### 3000 Amp Square Jaw Probe Kit

(AW0028XX) This square clamp is great for higher currents, up to 3000A. The square jaw permits multiple conductors or bus bar positioning.



### Reflect and Solid State Optics with Meter Band Clamp

(AW0017XX) This optics solution combines both reflect optics for mechanical meters and pulse detecting optics for solid state meters in one convenient package. Lock down optics, easy mode selection, LED indicators, and a secure grip band clamp make this a valuable addition to any field test kit.



### 25' Current Probe Extension Cable

(AW0018XX) Extend the distance from the WE-30 to the test location by 25' with this cable. Connect up to four to increase the overall distance to 100'. This option works with 150 amp and 800 amp clamp-on probes, high voltage current probe, high voltage probe, and AmpFlex<sup>®</sup> current probe kits.



### Standards Compare Kit

(AL0018XX) With an external standard and WECO's Standards Compare Kit you can make sure your WE-30's internal standard is delivering the high accuracy results you need. All of the necessary cables are included and the WE-30's user-friendly, onboard software makes the standards compare test a snap. Available kits include RD-2x, RD-3x and RM compatible. *Photo: RD-3x Kit.* (AL0021XX)



### Advanced I/O Breakout Cable

(AW0022XX - 8') (AW0025XX - 12') The 8' Advanced I/O Breakout Cable is used to connect KYZ outputs from meters into the WE-30's Advanced I/O Connector. The Advanced I/O Connector has two Form C input channels that can be independently configured as two Form A input channels. The Advanced I/O Connector also has two Form A output channels and one Form C output channel.



### Adapter Kit For Customer Supplied Sensor Link Probe

(AW0019XX) For customers who already own compatible sensor link voltage or current probes, this low cost adapter kit makes it possible to use with your WE-30.



### High Potential Current Probe Kit (2000A, 150KV)

(AW0011XX) The high potential current probe kit (2000A, 150KV) includes a fiber optic isolated current probe with 3.85" wide jaw for current measurements over 600V. Detachable line hanger, adapter and probe with hot stick mounting capability all come in a convenient carry case.



### High Potential Probe Kit (40KV)

(AW0012XX) This kit is a power quality tool for 120V to 40KV applications. Determine volts, amps, frequency, sags, and swells from primary conductors. A fiber optic link provides the isolation. Kit comes complete with carrying case, hot stick mounting capability, and adapters.



### Barcode Option

(AX0023XX) The WE-30's onboard software has been built from the ground up to take full advantage of barcode scanning to save you valuable time when meter testing in the field. With just one scan of a barcode you can automatically enter the meter's faceplate information, load the appropriate test sequence, and recall the last saved results for that particular meter.



### Hard Case

(BW0065XX) This ultra durable Pelican hard case provides protection and convenience. Clamp tight latches, a lockable lid, no-flat wheels, and ample foam cushioning ensure the unit is protected from the rigors of field testing. A collapsible pull handle, lead storage space, and built-in organizational pockets help you keep every thing in its place while getting the unit from site to site.



Accessories continued on next page...

## Optional Accessories Continued

### **KYZ Cable Set (AW0009XX)**

All you need is a KYZ cable set to conduct a KYZ test with your WE-30 in either demand mode or performing an energy test using the meter's KYZ output. This set connects right to the WE-30 while standard yellow, black, and red plugs connect to the meter.



### **WE-30 Cable Set for RM/RD/uJoule Interchange Standard (AW0024XX)**

This cable set allows for an external Radian standard or uJoule to be put in series with the WE-30 during a meter test for tie line testing.



### **Alternate Termination Voltage and Current Cable Sets**

(AW0015XX) (AW0016XX)

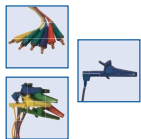
Not all meter shops have the same needs, so WECO offers two optional voltage and current cable sets. The first comes fitted with test paddle terminations for use with switchboard meters. The second set comes unterminated, allowing you to terminate the cables.



### **Alternate A, B, C, Phase Current Cable Clips With Alligator Clips, Right Angle Plugs, & Alternate Alligator Clips**

(BW0116XX) (BW0117XX)

Not all meter test switches are made exactly the same. WECO provides options to meet all your connection needs. These alternate alligator clips are another method of connecting the current leads to your meter test switch.



### **Winboard Embedded Remote App**

Use your iPhone or iPad to unlock the power and flexibility of your WE-30 from the palm of your hand.



Cold weather? Connect the WE-30 to the meter and run the necessary tests from the comfort of your work truck. Download this free App from the iTunes App Store.

## Redefine Meter Testing With The Combination Of The WE-30 And The Model 3230



Bring the WE-30's features back to the shop with the three-phase smart shop stand Model 3230. The 3230 features built-in laser optics, Smart Socket™ technology and automatic meter form selection. Connect the WE-30 to the 3230 side panel using the included cables and the WE-30 Winboard Embedded software automatically sets the meter form, which will then populate on the Model 3230 LCD display panel, and now you are ready to test. Not only does the 3230 make testing socket meters a snap, but it expands the current capability of the WE-30 to a full 50 amps, allowing the user to test class 320 amp meters.

With lock-down optics that stay where you put them and a simple push-button design for easy optic selection, the Model 3230 is ideal for van mounting. With the 3230 attached you have all the power of the Model 2350 plus the ability to quickly remove the WE-30 for testing right at the site.

The WE-30/3230 combination is a revolutionary testing package that redefines the state-of-the-art in meter testing.

### Features:

- ▶ Form selection controlled from the WE-30; no additional setup required or connection changes
- ▶ Minimal insertion force Smart Socket™
- ▶ Compensated current boost transformers for doubling the WE-30's 30 amp max current to 50 amps per phase
- ▶ Barcode scanner input
- ▶ Laser optics



# Features

- Microsoft Windows® 7, 64 bit operating system
- Three-Phase Radian Research RD-30, high-accuracy internal standard recognized and accepted by NIST (standard upgrades available)
- Fuse protection on all voltage inputs (1 auxiliary power, and 3 potential source/measurement)
- 2 USB ports
- 1 VGA port
- 1 Ethernet 10/100 port
- 1 COM port
- 1 simple three wire KYZ input
- Advanced I/O port:
  - >> 4 KYZ inputs  
(can be configured as 1 KYZ input)
  - >> 2 KZ inputs  
(can be configured as 1 KYZ output)
  - >> 1 KYZ output
  - >> 2 KZ outputs  
(can be configured as 1 KYZ output)
- Optical communications port
- 5 pin LEMO® connector for meter optical probes

- BNC connector for pulse out (standard pulses or test pulse), click switch input, and external standard compare pulse input
  - Pulse LED
  - Audio pulse volume control
  - 3 voltage status LEDs (1 per phase)
  - 3 current status LEDs (1 per phase)
  - 3 current transformer clamp-on inputs (1 per phase)
  - Safety ground post
  - Per phase potential color-coded safety jacks for potential and current inputs/outputs
  - 4 quadrant, 3 phase, simultaneous measurements for active, reactive and apparent energy and power
- Functions include:

*Watt hours, volts, amps, phase angle, power factor, VAR hours, Q hours, watts, VA hours, VA, VARS, frequency, forward and reverse energy flow. Optionally test average responding Vahrs, VA, Volts, Vhrs, amps, Ahrs.*



# Specifications



\*Soft Case - pictured far left  
\*\*Optional Hard Case - on right

- **Voltage Sources:**

- >> *Voltage output: 20 to 600 volts AC with 100mV resolution, 30VA per phase*
- >> *Voltage accuracy:  $\pm 0.2\%$ ,  $\pm 10\text{mV}$  true RMS*
- >> *Voltage harmonic distortion: Less than 1% THD worst case (pure sine wave selection)*
- >> *Harmonics sourcing: Through the 60th order user-defined per phase*

- **Current Sources:**

- >> *Current output: 0.01-30A per phase with 1mA resolution, 50VA per phase, 2.5V max compliance*
- >> *Current accuracy:  $\pm 0.2\%$ ,  $\pm 1\text{mA}$  true RMS*
- >> *Current harmonic distortion: Less than 1% THD worst case (pure sine wave selection)*
- >> *Harmonics sourcing: Through the 60th order THD user-defined per phase*

- **Energy Measurement Error Direct (0.2A to 30A and 30V to 600V):**

- >> *Energy Error for active, reactive and apparent power is subject to the selected integrated Radian Reference Standard:*  
*RD-30 =  $\leq \pm 0.04\%$*   
*RD-31 =  $\leq \pm 0.02\%$*

- **Power Measurement Error Indirect with MN03 clip on CT and RC-CTA1 adapter (0.2A to 100A, PF = 1):**

- >> *Active and Reactive;  $\leq \pm 0.20\%$  (0.2A to 100A)*

- **Phase Control:**

- 0°-359.95° in 0.05° steps*

- **Phase Accuracy:**

- $\pm 0.10^\circ$*

- **Test Frequency:**

- 45-65Hz in 0.001Hz steps*

- **Test Frequency Accuracy:**

- 0.005%*

- **Auxiliary Power Input Range:**

- 90-300V AC auto-ranging*

- **Input Frequency Range:**

- 45-65Hz (fundamental)*

- **Case Dimensions and Base Weight:**

- 24" W  $\times$  12" D  $\times$  24.7" L, 42.5 LBS - Soft Case\**  
*25.5" W  $\times$  13.5" D  $\times$  25.5" L, 82 LBS - Hard Case\*\**

- **Temperature:**

- >> 0°C to 55°C (32°F to 131°F) operation*  
*>> -20°C to 70°C (-4°F to 158°F) storage*

- **Humidity:**

- 0%-95% non-condensing*

- **Warranty:**

- One (1) year international limited warranty (all parts and labor). Two (2) year domestic limited warranty (all parts and labor).*

- **Service:**

- All required service on the Model WE-30 will be completed from the office of Watthour Engineering Company, Inc., a Radian Research Company, located in Pearl, MS. WECO maintains a stock of all components and should a part fail, would in most cases be able to provide a replacement part within 48 hours.*