

Powermate 330 - Detailed Test Instructions

{Without Integrated Site Testing}

- 1) Turn Unit ON and **Verify** the 3 ϕ current probe set attached to the unit matches the set selected for usage (ie, verify “**CAL=xxxxx**” name on the right side of the screen). {To change the selected probe set, press <CTRL> and then <#4>; <F5> to exit}
- 2) Press the <PEAK> key.
- 3) Enter **Filename** as the {Serial # of meter}, **Description** as the {Customer Name}, **User** as {your initials}, and **Acnt** as {Account #}. [Only the filename is required].
- 4) Press <F5> key to accept the site description data entry.

Steps 5 to 8 are optionally used to enter additional special site descriptive data

- 5) Press the <PEAK> key and then press the <F2> key.
- 6) Enter correct information for **Address**, **Account#**, **Meter#**, etc... as desired.
- 7) Press the <I/O> key and the <3> key to save this information screen.
- 8) Press the <F5> key TWICE to accept the information and return to Main.

- 9) Press the <F1> key to select the **Service Type**:
If site is 3-phase, 4-wire, with Form 9 meter, leave Auto Detect service. Otherwise, scroll through the service types and select the correct definition of this site.
- 10) Press the <F1> key to accept the Service Type.
- 11) Connect voltage clips and current probes: Normal definitions are: Red=A, Black=B, Yellow=C but use HELP (connect) for guidance as needed.
- 12) Press the <2> key and verify the Vector Analysis is OK: Verify the voltage and current vectors for each phase are properly paired (Use F3 as an aid). Press the <I/O> key and the <3> key to save this information screen.
- 13) Press the <F5> key to exit the Vector Analysis.
- 14) Press the <3> key and verify the Power Data Table is OK: Verify normal voltage and current values and (usually) positive watts for each phase with high PF values. Press the <I/O> key and the <3> key to save this information screen.
- 15) Press the <F5> key to exit the Power Data Table.
- 16) Press the <1> key and verify the Waveform is OK. Press the <I/O> key and the <3> key to save this information screen.
- 17) Press <F5> **twice** to return to Main Menu.
- 18) Press the <4> key and verify Harmonic Analysis for current is OK. Press the <I/O> key and the <3> key to save this information screen. Press <F2> to verify Harmonic Analysis for voltage is OK. Press the <I/O> key and the <3> key to save this information screen. Press <F5> **twice** to return to Main Menu.
- 19) Start the formal testing by pressing the <6> key **Meter Testing**.
- 20) Enter the #Revolutions (enough for a 1 minute test), Meter Constant (Kh), verify the Test Mode is set to “W-HR” (watt-hour), and verify pulse factors are set to 1.000 (use up/down arrow keys to move between fields).
- 21) Press the <ENTER> key once to accept data and start the pulse setup mode.
- 22) Install the optical pickup (or IR pickup) and adjust until meter pulses are indicated on the screen. (Cover with dark rag if sunlight present)
- 23) After the pickup is aligned, press <ENTER> once to start the Meter Test.
- 24) After Meter Test is complete, review the displayed results. If within limits, continue to step 26. If not within limits, verify there is no setup problem and continue to step 26 to save the results if no setup problems are found.
- 25) To retest after discovery and/or correction of a setup problem, press the <F5> key once. Correct any data entry errors on the setup screen (if needed). Press <ENTER> once and again check the optical pickup. Then press <ENTER> again to restart testing.

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- 26) To accept the results of the previous Meter test, press the <I/O> key and then press the <3> key. Press <F5> twice to return to Main Menu.
- 27) Press <5> “CT Testing” at the Main Menu screen. At the Test CT#1 screen, press the following key based on the desired test:
 - Press <F3> for Burden and Ratio test (Recommended)
 - Press <F2> for Burden ONLY test (If CT Primary not accessible)
- 28) Use down-arrow to move to the **CT Secondary** line and then use right/left arrow keys to set “BURDEN/DIRECT” for secondary current input from a test switch.
- 29) {Skip if Burden ONLY test} Use down-arrow key to move to the **CT Primary** line and then use right/left arrow keys to set for the actual probe being used for the CT primary current measurement (see Cautions below):
 - If the High-Voltage fiber optic probe is used, select “BNC/HVOPT”
 - If the 36" Flex probe is used (single wrap), select “IQV/FLEX36”
 - If the 36" Flex probe is used (double wrap), select “IQV/FLEX18”
 - If a clamp-on probe is used, select “+5A/xxxxxx” (xxxxxx=probe name)
- 30) (If not correct) Use down-arrow key to move to the **Maximum Burden** and then use right/left arrow keys to set for “1.0 Ohm”. (Site may change this test limit)
- 31) Press <F3>, enter the nameplate CT and VT ratios, and press <ENTER>.
- 32) Unplug ALL 3 IQ Plugs (or PX186 clamp-on) and set them aside (do not drop).
- 33) **Make sure the Burden cable is connected** and then plug the Burden Direct (purple color code) into Phase A secondary test switch position.
- 34) {Skip if Burden ONLY test} Connect the CT Primary probe selected in step 29 to the Powermate and then around the CT Phase A primary conductor. Refer to specific setup instructions on the following page.
- 35) Press <ENTER> to start the CT testing and display the test results.
- 36) Observe any displayed warning messages and review the test results. If within limits, continue to step 38. If not within limits, verify there is no setup problem and continue to step 38 to save results if no setup problem found.
- 37) To retest after discovery and/or correction of a setup problem, press the <F5> key once. Correct any data entry errors on the setup screen (if needed). Then press <ENTER> again to restart CT testing.

Steps 38 to 39 are optionally used to store plots *and* table test data screens

- 38) Press <I/O> and then <3> to save the displayed graphical CT test results screen.
- 39) Press the <F4> key **3 times** to display the CT test results screen in a data table.
- 40) Press the <I/O> key and then press the <3> key again to save the final CT test results.
- 41) **To test CT Phase B:** Press the <ENTER> key to start the CT test setup menu, plug the Burden Direct (purple color code) into Phase B secondary (test switch), move the primary current probe to the phase B primary conductors, and repeat steps 35 through 40.
- 42) **To test CT Phase C:** Press the <ENTER> key to start the CT test setup menu, plug the Burden Direct (purple color code) into Phase C secondary (test switch), move the primary current probe to the phase C primary conductors, and repeat steps 35 through 40.
- 43) After all desired screens are saved, press <ENTER> to skip further entries.
- 44) Carefully remove the primary probe and all secondary connections. Neatly fold or roll the test leads (as appropriate) into their cases.
- 45) Verify data screens are saved by pressing the <I/O> and then <4>. Scroll through the screens using the arrow keys to view the information.

CONNECTION STEPS for CT Primary Probes :

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If using High Voltage Fiber Optic Probe: Connect 3' coax cable from receiver module to the BNC connector (Process Voltage In) of the Powermate. Connect the "fork" shaped measurement head to the end of a hot stick (telescopic). Press the black buttons on both modules to turn both modules ON (receiver display reads 0.0) and quickly extend the hot stick until the opening of the probe is fully around the Phase "x" conductor (black button faces source). {Unit turns OFF in 2 minutes if no current.}

If using 36" Flexible Current Probe: [*Less than 600V***]** Connect the Flex probe to the IQV input of the Powermate (use extension cables if required). Wrap the flexible probe around ALL of the CT primary Phase "x" conductor cables. Wrap twice if specified in step 28 above. (Arrow on Flex probe points toward the source.)

If using Clamp-On Current Probes: [*Less than 600V***]** Connect the clamp-on probe to the +5A input of the Powermate (use 5A extension cables if required). Clamp the probe around ALL of the CT primary Phase "x" conductor cables. (Arrow on probe points toward the source.)

CAUTIONS:

- 1) **ONLY** the High Voltage Fiber Optic probe may be used for measurements on conductors at voltages above 480V.
- 2) The gray extension cables used with the flexible probe is only rated to 300 volts and should not be allowed to droop inside a CT cabinet. The black cables between the flexible probe head and final output are rated for over 600 volts and are safe for running through a 480V service area.
- 3) When using the 36" flexible probe, try to wrap the probe twice around the CT conductors for best accuracy. If wrapped twice, remember to setup the Powermate to the FLEX18 setting because the current output will be doubled and this setting will recognize the proper output. Keep the wrapped probe as close to perpendicular to the conductor(s) as possible.
- 4) When using clamp-on probes, verify there is nothing on the closing surfaces of the probe and that the probe jaws close fully. (Allow the probe jaws to "snap" closed and listen for a solid impact.) Keep the probe as close to perpendicular to the conductor(s) as possible.