



## **OPERATING INSTRUCTIONS CATALOG NO. 2199 Desktop Meter Qualification Board**

### **Description**

Provides complete capabilities for evaluating meters and communications performance, TESCO's 2199 can generate any voltage and load conditions the meter may encounter in the field. Apply non-sinusoidal voltages with complex load waveforms. Perform disconnect test and reconnect tests without having to worry about being able to drive the meter's switches.

- Voltages are completely programmable from 30-480volts.
- Loads are completely programmable from 0-50 amps.
- Unit weight is 20 lbs.
- Power Requirements: 120VAC, 1PH, 15A, 60Hz. (Power cord included)

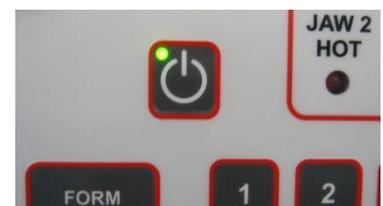


### **Inspection and Setup**

The Cat 2199 is shipped in a heavy walled box and is surrounded by foam protection. Before opening the packaging, inspect the outer package for damage. If damaged, stop, take pictures, and call the factory at 1-800-785-2338. After inspection, open the box. Inside the box you will find the main unit, the power cord, and associated paperwork. Carefully remove the unit from the packaging, place on your selected desktop, and install the power cord into the rear of the unit.

### **Power Up and Control Panel**

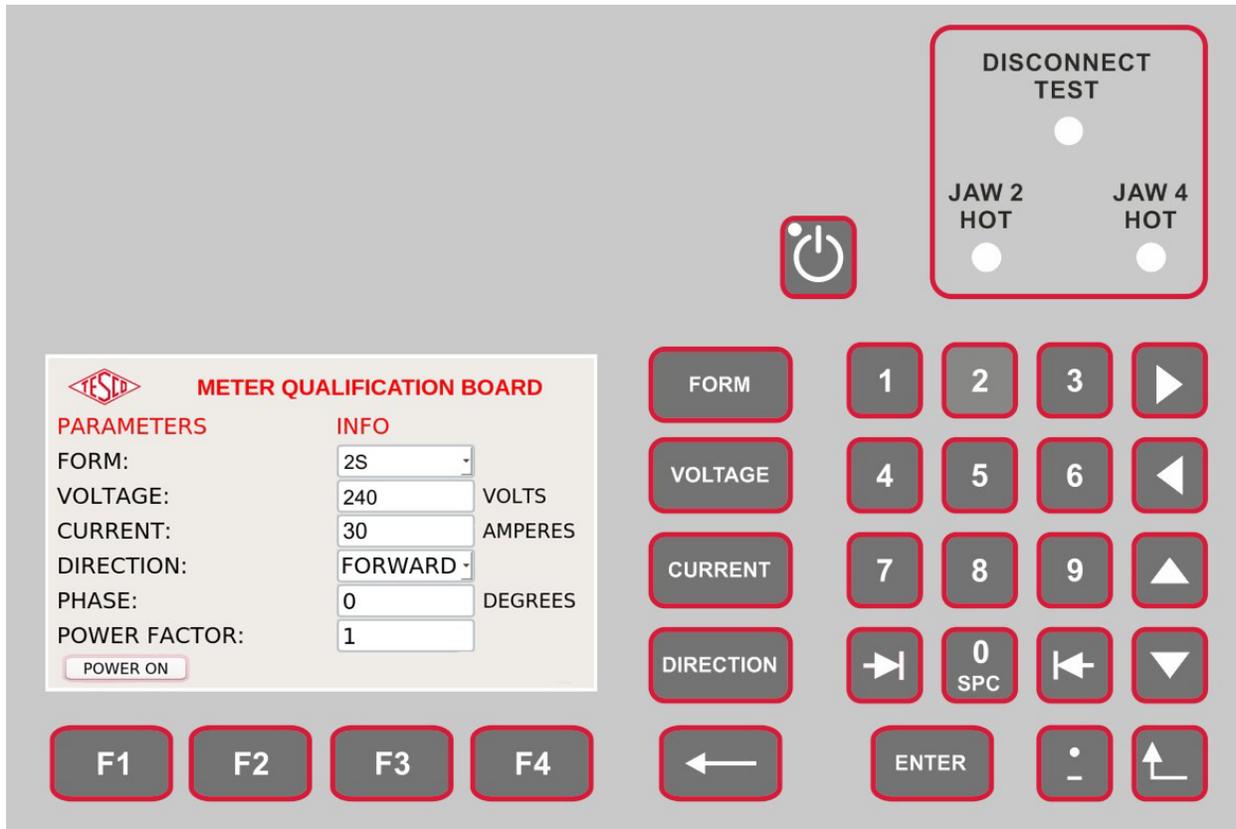
Connect the power cord to a 120V, 15A service. Turn on the main circuit breaker located at the rear of the unit. After powering on the main breaker, press the power button located on the keypad area. Hold the power button until the green LED lights. This should take less than one second. During power up you should see, on the display screen, the unit boot up to the main screen.





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The control panel is designed to be simple to use for your everyday tasks.



**Basic Keypad Operation**

The basic functionality of the system can be accessed directly through the keypad.

Key	Function
	POWER ON/OFF – Press until green led lights to turn on. Press and hold to turn off.
	Press to highlight the form entry list box. A form can be selected from the list by using the UP or DOWN ARROWS or directly entered using the numeric keypad.



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	Press to highlight the voltage entry text box. Any voltage between 30.00 to 480.00 volts can be entered.
	Press to highlight the current entry text box. Any current between 0.1 and 50.00 amps can be entered. If the selected form is a transformer rated form then the maximum will be restricted to 20.00 amps.
	Pressing the direction allows the user to quickly change the direction of energy flow. When reverse is selected it has the effect of adding 180 degrees to the current vector.
	BACKSPACE – Erases the previous character
	Numeric key 1 to 9 for entering values.
	Soft key – The function of the soft keys changes based on the context. A label above the key shows each key’s function.
	Zero and space key. Pressing the key once enters “0”. Pressing the key twice rapidly will enter a space.
	DOWN ARROW: Use to select items in a list.
	UP ARROW: Use to select items in a list.
	RIGHT ARROW: Move right within an entry field.



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	LEFT ARROW: Move left within an entry field.
	TAB: Move to the next data entry field.
	BACK TAB: Move to the previous data entry field.
	Return to previous screen.
	Select a response.



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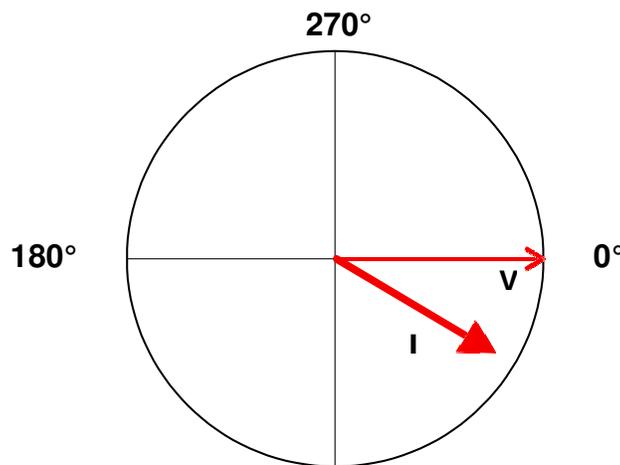
**System Operation**

To start, place a meter in the socket.

- **Meter Form:** Select the meter form by pressing FORM or by using the navigation arrows to select the entry box on the screen. You can enter a form either by typing in the number, or by selecting it from the list using the UP ARROW or DOWN ARROW keys.

When a meter form is selected the voltage and current will be automatically be set to the most common voltage and current with which that form is used. For example, when you select a form 2S meter, the software will set the voltage to 240 volts and the current to 30 amps.

- **Voltage:** Set the voltage by pressing the VOLTAGE key or navigating to the entry box on the screen. Any voltage from 30.00 to 480.00 volts can be set. The entered value is rounded to two decimal points. Be aware that the output accuracy is  $\pm 0.5\%$ , however typical accuracy is much better. Setting resolution is approximately 0.01% of full scale.
- **Current:** Set the current by pressing the CURRENT key or navigating to the entry box on the screen. Any current from 0.1 to 50.00 amps can be set. The entered value is rounded to two decimal points. Be aware that the output accuracy is  $\pm 0.5\%$ , however typical accuracy is much better. Setting resolution is approximately 0.01% of full scale.
- **Direction:** The direction button allows you to quickly select delivered or received. When reverse is selected, 180 degrees is added to the phase specified in the PHASE entry.
- **Phase:** The phase of the current with respect to the voltage. A value of 30 means 30 degrees lagging.



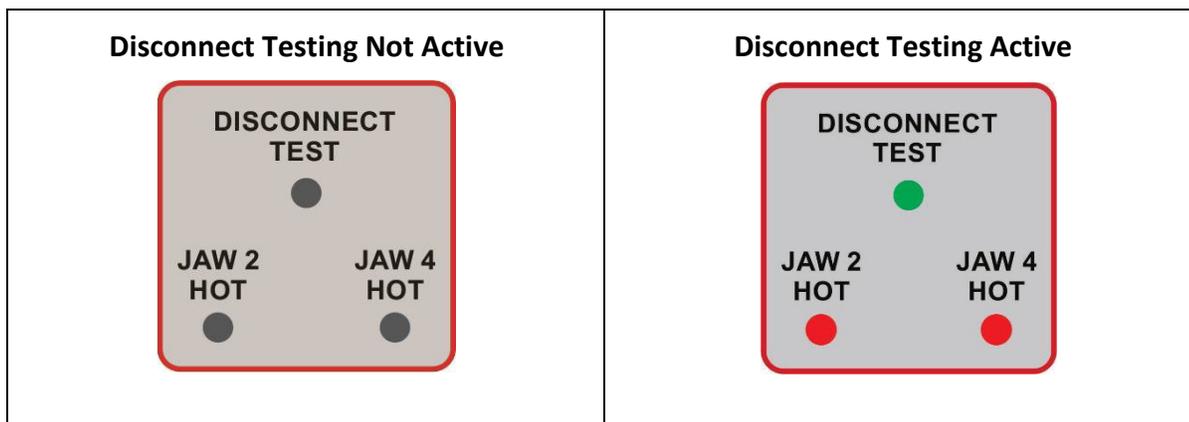
**30 Degree Lagging Current**



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In disconnect mode the voltage to the meter is switched from the digitally synthesized source to an auxiliary transformer. The transformer applies 0 – 120 – 240 volts to the meter with the 120V winding acting as a virtual “neutral”.

When disconnect test mode is active the green LED indicator will be lit, on the control panel.



The green LED indicates you are in disconnect testing mode. The red LEDs indicate the presence of voltage at either stab 2 or stab 4. The indicator lights should be present on all sockets in the bank.

Performing a disconnect test is completed as follows:

- 1) Disconnect Test is selected on the keypad. This causes the voltage transformer to be connected to all three meter sockets.
- 2) It also causes the DISCONNECT LED to light, and the JAW 2 and JAW 4 LEDs to be connected. They should light.
- 3) If you want to test with current running, set the desired current and enable it.
- 4) To disconnect any meter issue the disconnect command from the laptop. The Jaw 2 and Jaw 4 LEDs for the meter should go off.
- 5) You can reconnect, or you can apply a Back Voltage to the meter, to verify it will NOT reconnect when a back voltage is present. When the meter reconnects the red LEDs will come back on.