

AEGIS-OSC-9100

Shaft Voltage Tester

Digital Oscilloscope Training



AEGIS-OSC-9100

Shaft Voltage Testing Digital Oscilloscope

- Dual-channel oscilloscope with 100MHz bandwidth
- Full meter functionality including resistance, current and AC/DC voltage
- USB/removable media storage
- One-Touch™ image capture capability
- Probe sets (1:1/10:1), Meter leads
- Compact carrying case
- 90 day warranty or 2 year extended warranty
- SVP-KIT-9100MB probe kit
- SVP-TIP-9100 replacement tips
- BAT-9100 spare/replacement battery



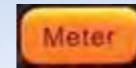
1.1: Multimeter Resistance Tests

Power On: Press the green power button



Setup to Use the Ohmmeter:

• Press the orange **METER** button



• Press **F1 Meter** and select **Res.**

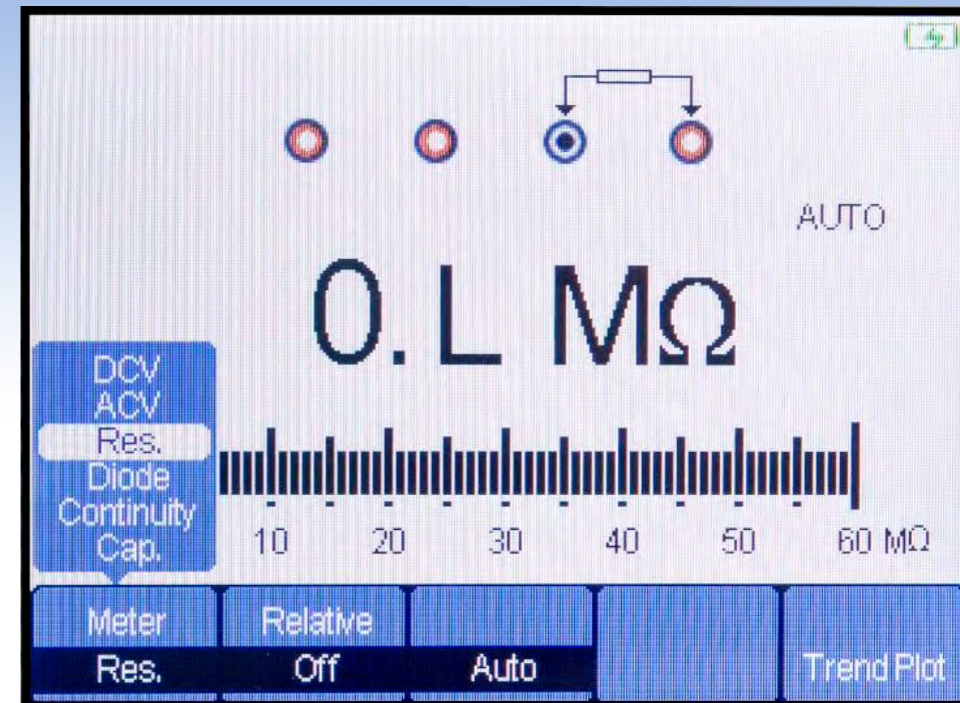
• Press the blue right arrow key to finalize selection

TIP: The blue right arrow is used to choose selections on all popup menus- like the Enter button on some other scopes.

• Plug the black lead into the black “COM” port and the red one into the red “VΩC” port at the right

Note: Attempting to measure resistance with the red lead in any other port will Damage your multimeter.

When damaged, the multimeter will display 1.00 for all quantities, no matter the input.



0.L MΩ means infinite resistance. There is no conductive path at all between the probes.



1.2: Verify AEGIS® Grounding

Verify the Multimeter Probes:

- ☀ Touch the meter lead tips together, or touch them both to a motor shaft or other bare metal object
- ☀ Measurement should be less than 1 ohm

TIP: If the measured resistance is large or continues to fluctuate significantly, try holding the probes groove-to-groove. If this doesn't help, the probes may be defective.



Verify Shaft Grounding:

- ☀ Place one lead on the AEGIS® ring
- ☀ Place the other lead on a bare metal spot on the motor frame or motor ground stud
- ☀ The result of this measurement should also be low



1.3: Test SVP Probe Tip

- Activate the ohmmeter
- Set probe to 10X
- Test ground
- Place the red meter lead in the probe connector, in contact with the metal spike in the center
- Touch the black meter lead to the metal of the probe tip.
- Make note of the reading. It should be 8-10 megohms ($M\Omega$)
- Now install the SVP tip on the probe
- Leave the red lead where it is and touch the black lead to the SVP tip fibers
- The reading should be similar to the previous.



TIP: If the probe+tip resistance is much larger than the probe's by itself, the probe is probably not far enough into the tip. Try to slide it farther in.

2.1 Oscilloscope Quick Start

The quickest way to prepare to measure shaft voltages:

1. Attach the probe and set it to 10X
2. Slide the end of the probe into an SVP tip as far as it will go
3. Tighten screw snugly
4. Attach the cable to the CH1 BNC connection on top of the scope, twist to secure
5. Factory Reset

- ☛ Press **Save/Recall**



- ☛ Press **F1 Setups**

- ☛ Choose **Factory** from the popup

- ☛ Press **F5 Load**

Factory settings nearly perfect for measuring shaft voltage. Only need change attenuation (default 1:1), and display scale (volts/div and sec/div).

4. Set the scope itself to 10:1:

- ☛ Press blue **CH1** button until CH1 menu and blue trace displayed

- ☛ Press **F5** until lower right displays "Page 1/3"

- ☛ Press **F4 Probe**

- ☛ Choose **10X** from the popup menu

- ☛ Press **Menu** to close the CH1 menu and clear the screen

- ☛ Similarly change CH2 to 10x setting



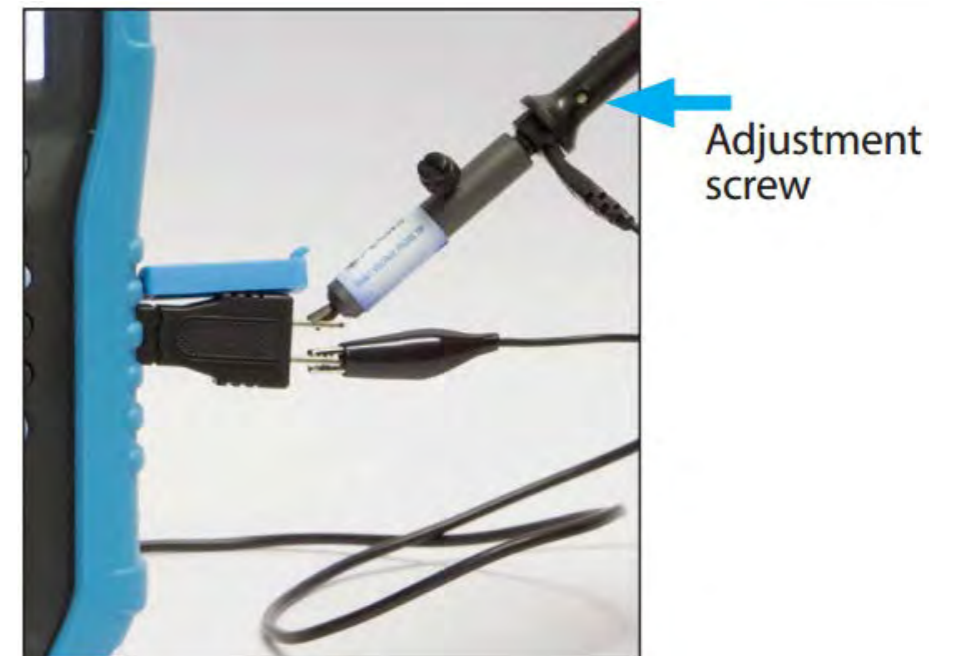
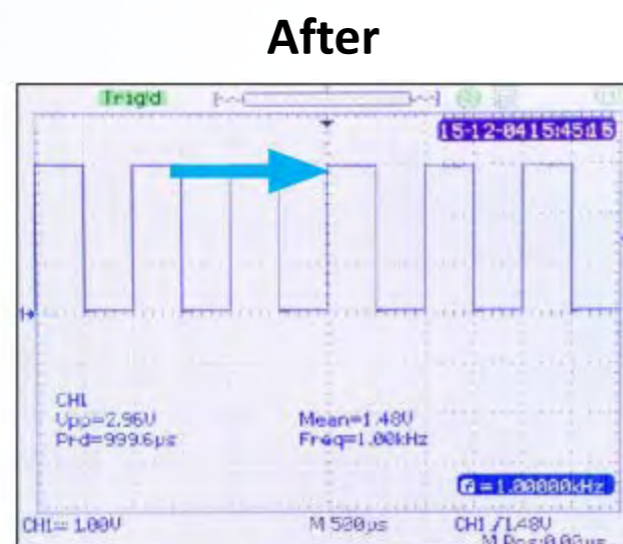
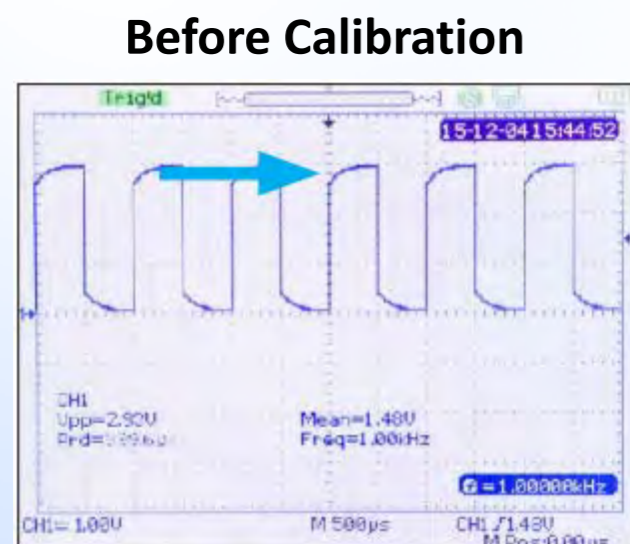
2.2 Oscilloscope Calibration (optional)

Calibration should at least be done the first time a new probe is used. This is necessary for measuring high frequencies accurately. Accurate high frequency measurements essential for measuring VFD-related phenomena, e.g. shaft voltages.

- Plug the two-pronged dongle into the small USB port on the side
- Clamp probe ground to lower prong and touch SVP tip to upper
- Press the blue **Auto** button

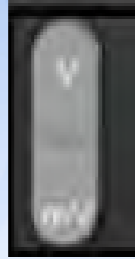
The screen will show a train of almost square waves, with corners that may be either either concave or convex.

- Using the small screwdriver included with the probe, adjust the adjustment screw until the onscreen waves exhibit sharp square corners



2.3 Setting Scope Voltage & Time Scales

1. Adjust volts/div with the **V | mV** buttons – 5 V/div good starting point



V enlarges scale/shrinks waveform (vertically)

mV decreases scale/enlarges waveform

Current volts/div shown in lower left

2. Adjust sec/div with the **s | ns** buttons – 250 μ s good starting point



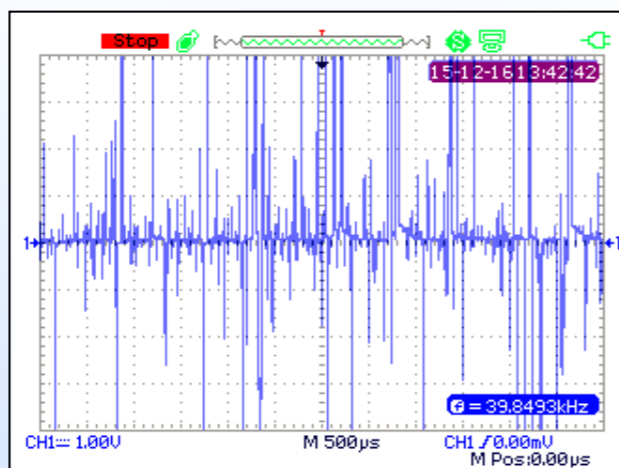
s enlarges scale/shrinks waveform (horizontally)

ns decreases scale/enlarges waveform

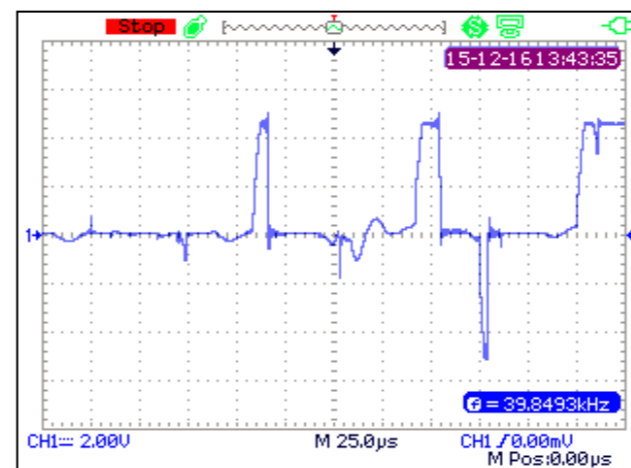
Current sec/div shown in lower center

One sample shaft voltage reading at default and adjusted scales:


Default settings: 1 V/div, 500 μ s/div



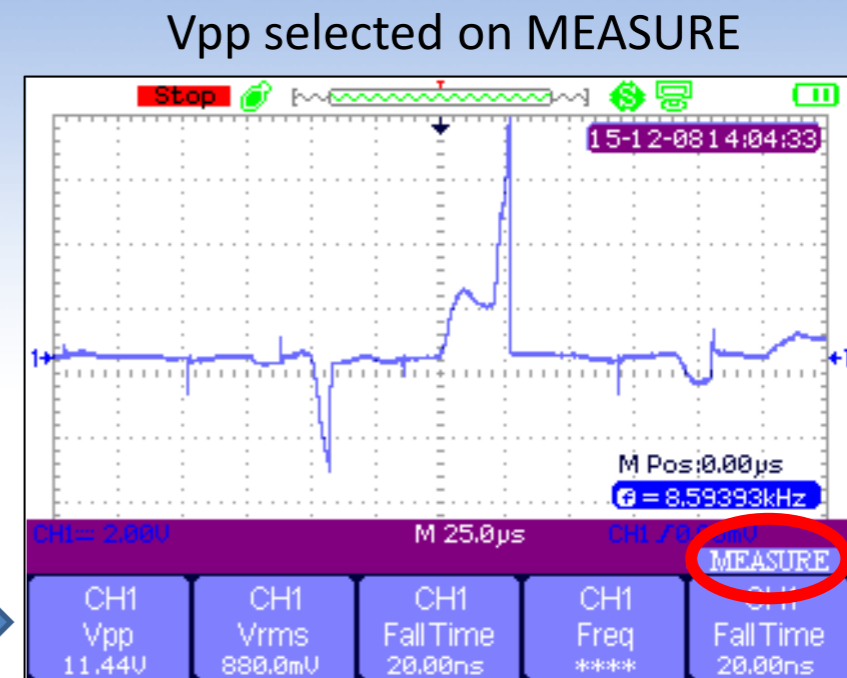
2 V/div, 25 μ s/div




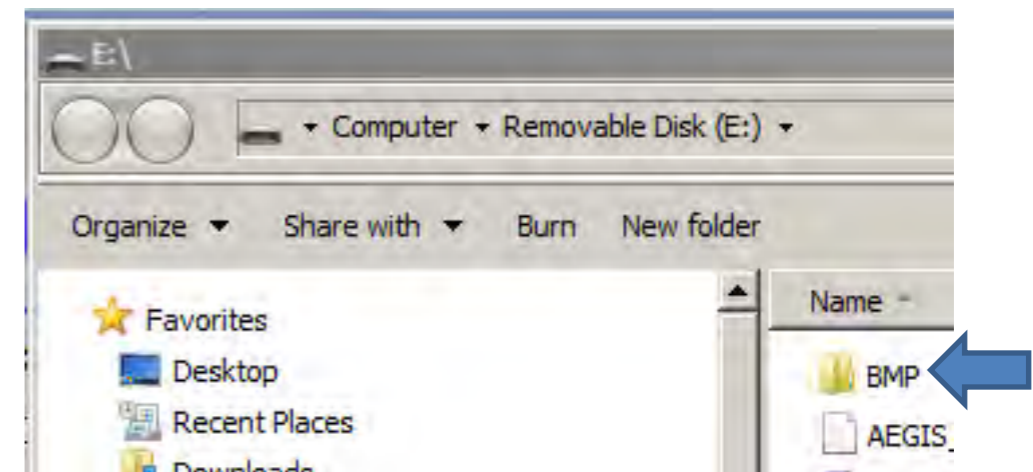
2.4 Measuring Vpp and Image Capture

1. Display peak to peak voltage Vpp: press **Cursor | Measure**  until MEASURE displays in the lower right corner. Vpp displays above **F1** key (with factory settings).

CH1 Vpp →

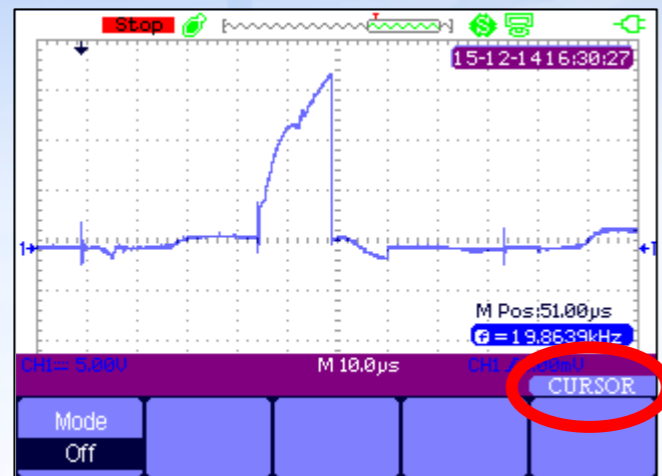


2. Freezing the screen: Press **Run | Stop** to freeze (or unfreeze) the screen.
3. Capturing Image of the Screen: With a USB drive in the USB port, press and hold **Save | Recall** until a progress bar () appears near the bottom of the screen.

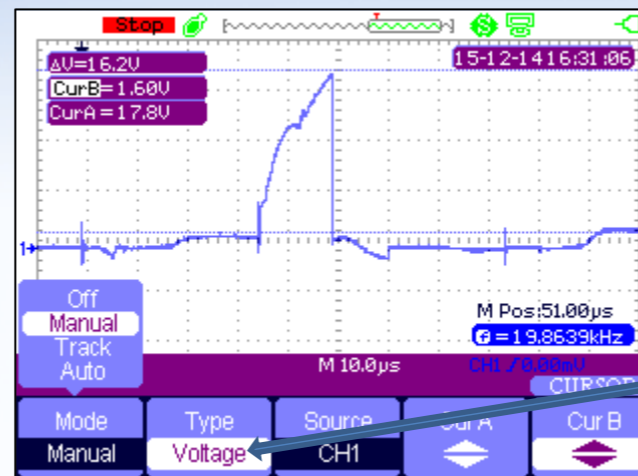


2.5: Measurement with Cursors

The problem with **MEASURE**: the MEASURE window needs to be left open to get V_{pp} . This window takes about 20% of the screen. Cursors are another method to measure voltage changes/ranges. They are particularly useful in finding peak voltages (as well as peak to peak).

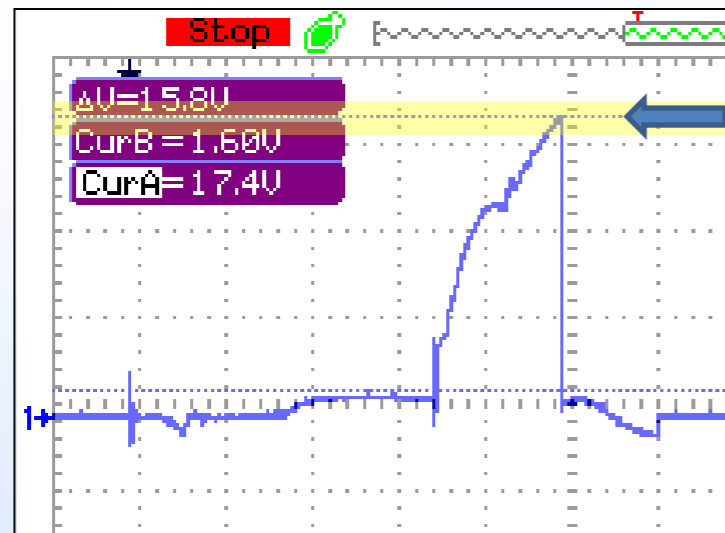


1. Press **Cursor|Measure** until CURSOR displays in lower right

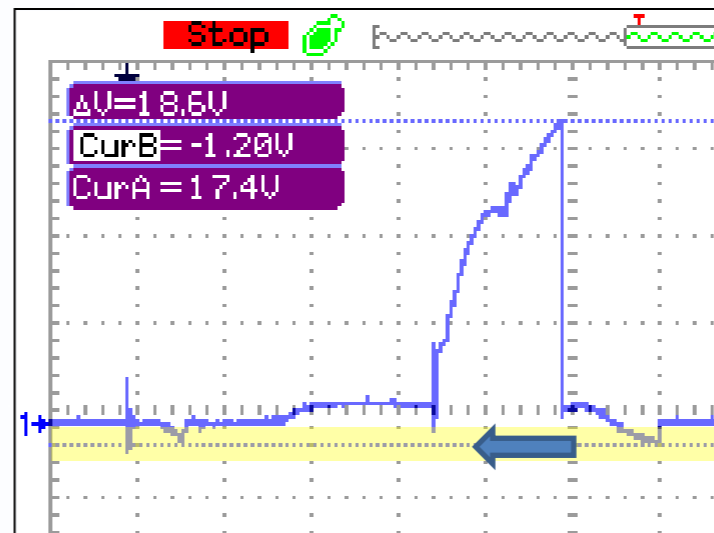


2. Press F1 and choose **Manual**

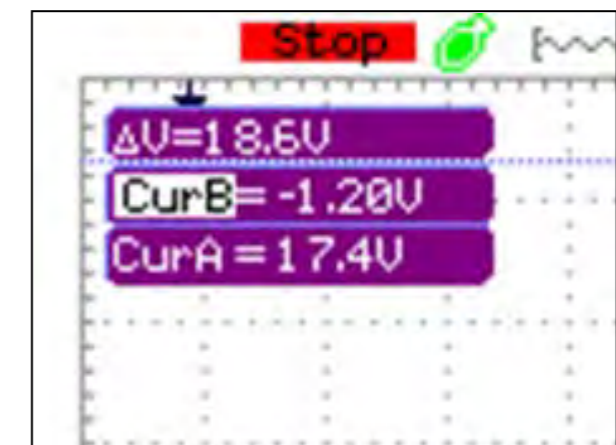
If Time appears over F2, press **F2** to change to Voltage



3. Press **F4 Cur A** and use the blue up and down arrows to position Cursor A



4. Press **F5 Cur B** and position Cursor B the same way



5. ΔV is the difference- in this case, the height of the peak voltage

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