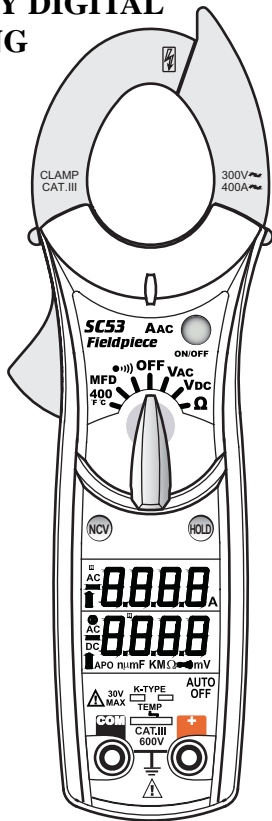


# DUAL-DISPLAY DIGITAL AUTORANGING MINI CLAMP METERS: SC52, SC53







## OPERATOR'S MANUAL

### Autoranging

Autoranging meters automatically select the range that gives you the best resolution. For example, when measuring 24VAC, the meter will select the 40VAC range and display "24.0". In the 400Vrange, you'd see "24" and in the 4V range you'd see "OL" for overload. When an n (nano),  $\mu$  (micro), m (milli), K (kilo), or M (mega) shows up in the display, you must multiply by  $10^{-9}$ ,  $10^{-6}$ ,  $10^{-3}$ ,  $10^3$ , and  $10^6$  respectively.

### Symbols used:

-  Caution, risk of electric shock
-  Caution, refer to manual.
-  Ground
-  Double insulation

### ⚠ WARNINGS ⚠

**DISCONNECT AND UNPLUG TEST LEADS** before opening case.  
**TEST NCV FUNCTION ON KNOWN LIVE WIRE** before using.  
**DO NOT APPLY VOLTAGE** greater than 30VAC or 60VDC to the thermocouple or the jacks when the rotary dial is on OFF.  
**DO NOT APPLY VOLTAGE TO THE JACKS** when the rotary dial is on microamps. Even low voltages can cause a current overload and blow the fuse. Replace blown fuse to regain function.

### Description

The dual-display clamp meters can simultaneously measure amps through the clamp and any of the functions on the dial of the meter. The amp clamp can be turned on and off independently from the rest of the meter to save battery life.

### Non-contact voltage

Press and hold the NCV button. When the clamp tip is close to an AC voltage, the NCV LED will light and the beeper will beep. The closer you get to AC voltage, the faster and louder the beep. The NCV function is sensitive enough to detect 24VAC on thermostats. (24V to 600V, 50Hz to 60Hz)

### Capacitance (SC53)

For motor-start and motor-run capacitors, first disconnect the capacitor from power. Discharge the capacitor by shorting the terminals before connecting to meter. Disconnect any resistors that might be between the terminals of the capacitor. If the capacitor is connected to the meter and "dsc" symbol is shown on the LCD, there is voltage in the tested capacitor that needs to be discharged before testing.

### Hold

There is a separate data hold function for each display. The HOLD button on the side of the meter corresponds to the AAC function and top display. The HOLD button on the face of the meter corresponds to the dial functions and bottom display. To keep the latest reading displayed on the meter, press the HOLD button relating to the display you want to freeze. Press the HOLD button again to go back to normal mode. The hold symbol "H" on the display will then disappear.

### Auto off

Both displays have separate auto off features after 10 minutes of user nonoperation. The meter will beep to announce the meter has turned off. If the ON/OFF button is depressed when the top display is automatically turned off, you will need to press it twice to turn

### For your safety...

**General:** Disconnect the test leads before opening the case. Inspect the test leads for damage to the insulation or exposed metal. Replace if suspect. Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material. When disconnecting from a circuit, disconnect the "RED" lead first, then the common lead. Work with others. Use one hand for testing. Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Keep your fingers behind the finger guards on the probes. Do not measure resistance when circuit is powered. Do not apply more than rated voltage between input and ground.

**All voltage tests:** All voltage ranges will withstand up to 600V. Do not apply more than 600VDC or 600VAC rms.

**AC tests:** Disconnect the meter from the circuit before turning any inductor off, including motors, transformers, and solenoids. High voltage transients can damage the meter beyond repair. Do not use during electrical storms.

### Maintenance

Clean the exterior with clean dry cloth. Do not use liquid.

**Battery replacement:** When either display shows the battery symbol to the right, the batteries must be replaced for that display. Disconnect and unplug leads, turn meter off, and remove the battery cover on the back (two screws). The battery on top is for the top display. The two batteries on the bottom are for the bottom display. Replace with CR2032 (3V) button-style batteries.

the top display on again. "APO" is shown on the display to let the user know that there is an Auto Power Off feature for this meter. APO cannot be disabled.

### Temperature (SC53)

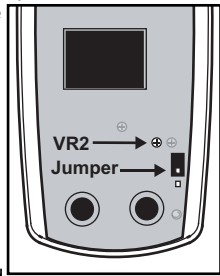
Temperature measurement will be accurate even in fast changing environments because of excellent temperature compensation. One thermocouple is included. No adapter is required.

1. Remove leads and slide the Temp switch to the right to close lead jacks.
2. Plug any K-type thermocouple directly into the meter to measure temperature.

### Field °F calibration (SC53)

For accuracies of  $\pm 1^\circ\text{F}$ , calibrate to a known temperature. A glass of stabilized ice water is very close to  $32^\circ\text{F}$  and is usually very convenient but any known temperature can be used.

1. Select 400°F range and connect thermocouple.
2. Remove back case (2 screws on back, one near clamp, other near base). Leave battery cover attached so batteries stay within back case.
3. Stabilize a large cup of ice water.
4. Immerse the thermocouple tip and let it stabilize.
5. To change the temperature scale from °F (shown on the right) to °C, close the black jumper just above the spring.
6. Adjust VR2 calibration pot with a small screwdriver to get within  $0.1^\circ\text{F}$  of  $32^\circ\text{F}$ . Each 1/4 turn should adjust the temperature about  $3^\circ\text{F}$ , no more than  $10^\circ\text{F}$  total. There's no need rotating the screw more than  $360^\circ$ ; doing so gets you back to where you started.
7. Attach case without screws to preview the temperature and continue until the displayed temperature matches the ice water's temperature ( $32^\circ\text{F}$ ).



### Limited warranty

This meter is warranted against defects in material or workmanship for one year from date of purchase. Fieldpiece will replace or repair the defective unit, at its option, subject to verification of the defect.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument.

Any implied warranties arising from the sale of a Fieldpiece product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. Fieldpiece shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim of such damage, expenses, or economic loss.

State laws vary. The above limitations or exclusions may not apply to you.

### Obtaining service

Send the meter freight prepaid to Fieldpiece Instruments. For warranty service also send proof of date and location of purchase. For out-of-warranty service send \$52 (SC52), \$66 (SC53) check or money order. The meter will be repaired or replaced, at the option of Fieldpiece. We will pay for the shipping to you using the same method (ground, air, next day, etc.) used to ship product to us.

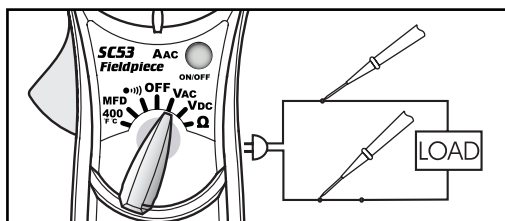


Fieldpiece Instruments, Inc.  
 580 West Central Ave. Suite A  
 Brea, CA 92821

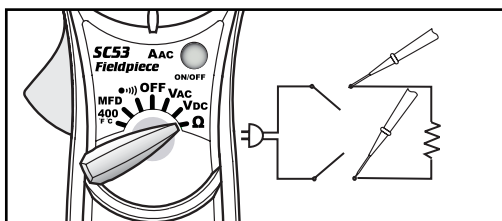
[www.fieldpiece.com](http://www.fieldpiece.com)

Phone: (714) 257-9060 Fax: (714) 257-9069

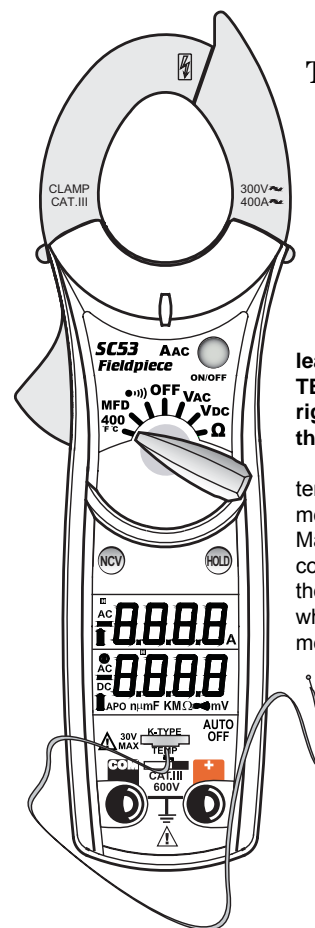
## Voltage



## Resistance



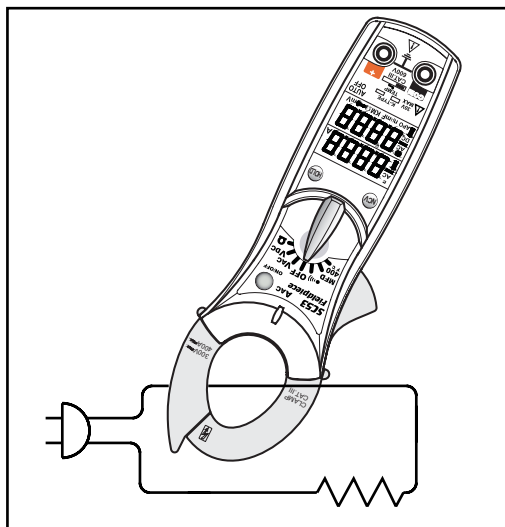
## Temperature



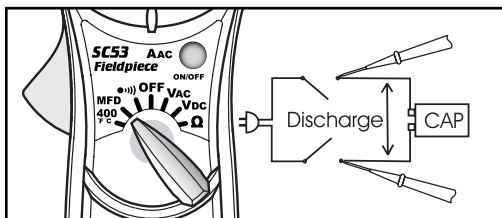
Disconnect test leads and slide TEMP switch to the right plugging in thermocouple.

Ensure the temperature being measured is stable. Maintain good contact between the thermocouple and what's being measured.

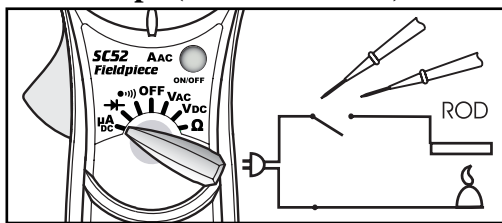
## Amps AC Through Clamp



## Capacitance



## Microamps (for flame diode)



## SPECIFICATIONS

**Display:** 3 1/2 digit liquid crystal display (LCD) with a maximum reading of 3999.

**Overrange:** "OL" or "-OL" mark indication.

**Auto power off:** 10 minutes.

**Operating environment:** 32°F to 122°F at <70% R.H.

**Storage temperature:** -4°F to 140°F, @ <80% R.H. with batteries removed.

**Accuracy:** Specifications good in ambient conditions of 74°F ±8°F, <75% relative humidity.

**Temperature coefficient:** 0.1x(specified accuracy) per °F. (32°F to 66°F, 82°F to 122°F).

**Altitude:** 6561.7 feet (2000m).

**Jaw opening capability:** 30mm (diameter) conductor

**Power:** Three lithium-ion CR2032 3V batteries.

**Battery life:** 100 hours typical for lithium-ion on AAC (top display), 75 hours typical for lithium-ion on dial functions (bottom display).

**Accessories:** One pair vinyl test leads, ATB1 k-type thermocouple (SC53), (3) 3V CR2032 batteries (installed), ANC4 carrying case, and operating instructions.

**Safety:** Designed to meet IEC61010-1 (EN61010-1) CATIII 600V and IEC61010-2-032 (EN61010-2-032), CATIII 300V, class II and pollution degree 2 indoor use comply with CE, UL61010B-1, UL61010B-2-032.

## DC Volts

**Ranges:** 4V, 40V, 400V, 600V

**Resolution:** 1mV

**Accuracy:** ±(0.5% rdg + 2 dgts)

**Input impedance:**

4V: 10MΩ

40V~600V: 9.1MΩ

## AC Volts (50Hz - 500Hz)

**Ranges:** 4V, 40V, 400V, 600V

**Resolution:** 1mV

**Accuracy:** ±(1.2% rdg + 5 dgts),

±(1.5% rdg + 5 dgts) on 600V range

**Input impedance:**

4V: 10MΩ

40V~600V: 9.1MΩ

**Minimum test time for stable reading:** 2 seconds

## Resistance

**Ranges:** 400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ

**Resolution:** 0.1Ω

**Accuracy:**

±(1.0% rdg + 4 dgts) on 400Ω to 400kΩ ranges

±(1.5% rdg + 4 dgts) on 4MΩ range

±(3.0% rdg + 5 dgts) on 40MΩ range

**Open circuit volts:** -0.45VDC typical, (-1.2VDC on 400Ω range)

**Minimum test time for stable reading:** 2 seconds

## AC Current (50Hz - 60Hz)

**Ranges:** 40A, 400A

**Resolution:** 0.01A

**Accuracy:** ±(2.0% rdg + 6 dgts)

## DC Current (SC52)

**Ranges:** 400μA, 4000μA

**Resolution:** 0.1μA

**Accuracy:** ±(1.0% rdg + 2 dgts)

**Voltage burden:** 1V (8V on 4000μA range)

## Capacitance (SC53)

**Range:** 4μF, 40μF, 400μF, 4mF

4.000mF = 4000μF

**Resolution:** 1.0nF

**Accuracy:** ±(3% rdg + 10 dgts) on 4μF

±(3% rdg + 5 dgts) on 40μF to 400μF

±(5% rdg + 20 dgts) on 4mF (4000μF)

**Minimum input range:** >100nF

**Safety:** "dsc" symbol on LCD indicates that the capacitor must be discharged before testing.

## Continuity

**Range:** 400Ω

**Resolution:** 1Ω

**Audible indication:** Less than 25Ω

**Response time:** 500ms

## Diode Test (SC52)

**Test current:** 1.2mA (approximate)

**Accuracy:** ±(3.0% rdg + 3 dgts)

**Resolution:** 10mV

**Audible indication:** Less than 0.25V

**Open circuit volts:** 3.0VDC typical

## Temperature (SC53)

**Range:** -30°F ~ 400°F

**Resolution:** 0.1°

**Accuracy:**

±(1°F) 32°F ~ 120°F,

±(1% + 1.5°F) -4°F ~ 400°F,

±(2% + 4°F) -30°F ~ -4°F,

**Sensor type:** K-type thermocouple

Overload Protection (no fuses to replace)	
VAC/DC	600VDC or AC RMS
AAC	400 AAC
Resistance	500VDC or AC RMS
Continuity	500VDC or AC RMS
Diode (SC52)	500VDC or AC RMS
Capacitance (SC53)	500VDC or AC RMS
μADC (SC52)	500VDC or AC RMS
Temperature (SC53)	60VDC or 30VAC RMS