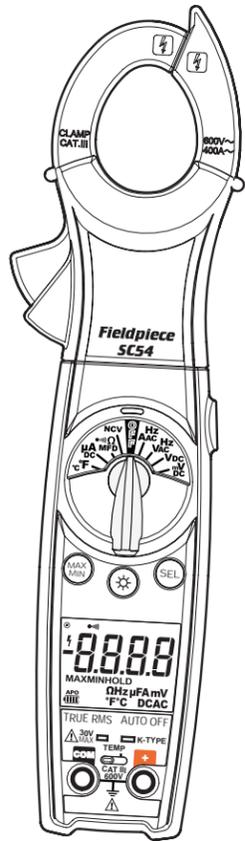


Fieldpiece

Swivel Clamp Meter

OPERATOR'S MANUAL

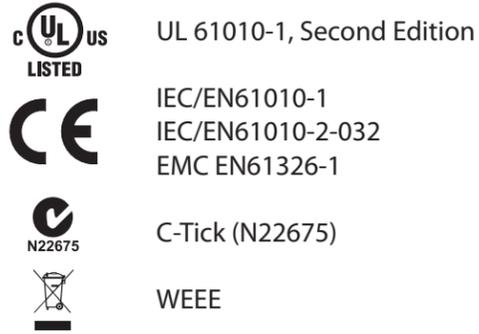
Model SC54



Quick Start

1. For electrical testing, connect test leads to "COM" and "+" jacks. For temperature testing, remove test leads and slide TEMP switch to the right.
2. Rotate the dial to your desired function. Press SEL to cycle through the parameters within the switch position.
3. Connect to test points and read measurement on display.

Certifications



CATIII 600V, class II and pollution degree 2 indoor use comply with CE, RoHS compliant.

Description

Your SC54 is a swivel clamp meter specially designed for the HVACR technician. The swivel on the SC54 allows you to get a good viewing angle on the display while taking amperage readings through the clamp, regardless of the wire orientation. The SC54 has the functions you want as an HVACR technician.

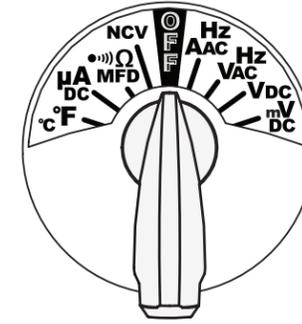
Get fast manual ranging performance on an easy to use auto-ranging clamp meter.

The SC54 is compatible with Fieldpiece accessory heads allowing you to measure many parameters on the SC54 display.

The bright blue backlight  makes it easier to use in any lighting condition. True RMS helps you take more accurate voltage and amperage readings on variable frequency drives.

The unique temperature circuit allows the SC54 to get accurate temperature readings faster when moving from a rooftop to a freezer. The easily accessible field calibration allows you to calibrate the temperature on your SC54 without hassle.

Controls



Rotate dial to the function you want to use.

-  Cycle through parameters or ranges within a dial position
-  Press to illuminate backlight for 3 min
-  Press to freeze maximum or minimum reading
-  Press to freeze the reading

Display

-  Battery Life Indicator
-  Auto Power Off Enabled
-  High Voltage Warning (+30V)
-  Manual Ranging
-  Data Hold Mode
-  Maximum Reading
-  Minimum Reading
-  Continuity Test
-  Frequency Test (hertz)
-  Resistance Test (ohms)
-  Capacitance Test (farads)
-  Micro Unit (10^{-6} , one millionth)
-  Milli Unit (10^{-3} , one thousandth)



Specifications

- Display:** 10000 count display with backlight
- Overrange:** (OL) or (-OL) is displayed
- Measurement rate:** 2 times per second, nominal
- Zero:** Automatic
- Operating environment:** 32°F to 122°F (0°C to 50°C) at <70% relative humidity
- Storage temperature:** -4°F to 140°F (-20°C to 60°C), 0 to 80% RH (with battery removed)
- Accuracy:** Stated accuracy @ 73°F±9°F (23°C±5°C), <75%RH
- Temperature coefficient:** 0.1 x (specified accuracy) per °C [0°C to 18°C (32°F to 64°F), 28°C to 50°C (82°F to 122°F)]
- APO (Auto Power Off):** Approx. 30 minutes
- Power:** Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22
- Battery life:** 100 hours typical alkaline
- Low battery indication:** Battery icon will be empty . "batt" displays along with a continuous beep when the battery voltage drops below the operating level. Meter shuts off in 5 seconds.
- Dimensions:** 258.3mm(H) x 71.2mm(W) x 42.7mm(D)
- Weight:** Approx. 278g including battery
- Altitude:** 6562 feet (2000m)
- Overload protection:** 600VDC or 600VAC rms unless otherwise stated in the individual test sections.
- Test leads:** Shall use UL listed test leads complied UL61010-031 rated CATIII 600V or above.

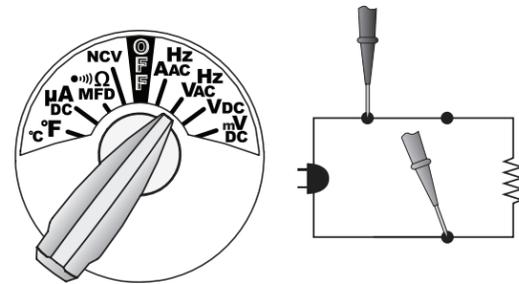
Functions

Voltage AC (VAC) (50Hz-400Hz)

Test power lines (120, 220, 480), test 24V going to controls, and test for transformer failure.

Ranges: 0 to 600V **Resolution:** 0.1V
Accuracy: ±(1.0% + 5 dgts) 50-100Hz
±(6%+5 dgts) 100-400Hz

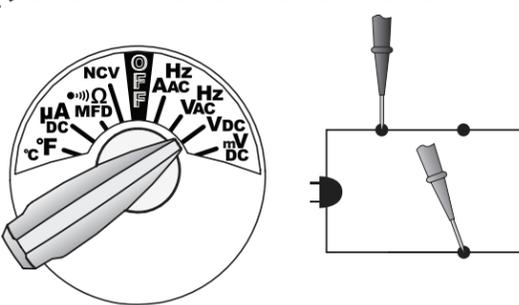
True RMS: Yes **Crest factor:** ≤ 3
Input impedance: 1MΩ



Voltage DC (VDC)

Select VDC to measure DC voltage.

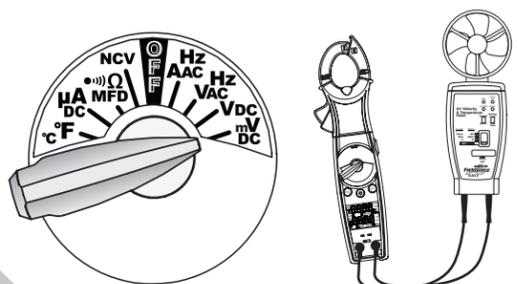
Ranges: 0 to 600V
Accuracy: ±(1.0% + 5 dgts) on 600V range
Resolution: 0.1V **Input impedance:** 1MΩ



MilliVolt DC (mVDC)

Select the mVDC range to display measurements from any Fieldpiece accessory head. See Modular Expandability section on reverse page for more details.

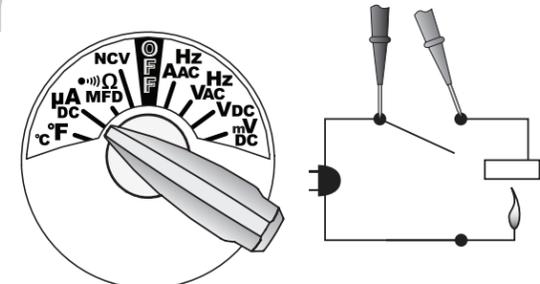
Ranges: 1000mV and 10000mV
Accuracy: ±(0.5% + 5 dgts)
Resolution: 0.1mV or 1mV **Input impedance:** 1MΩ



MicroAmps DC (μADC)

Microamps for flame rectifier diode test on a heater control. Connect leads between flame sensor probe and control module and turn heating unit on to read μA measurement. When the flame is on, there should be a measurable μADC signal, typically under 10μADC. Compare measurement to manufacture's specification to determine if replacement is necessary.

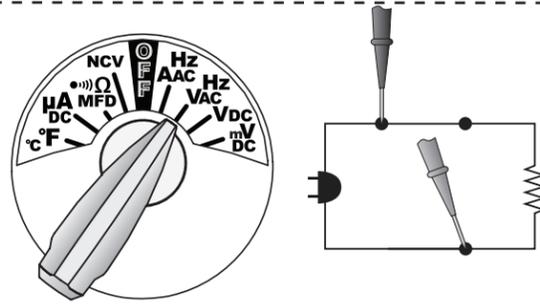
Ranges: 1000μA **Resolution:** 0.1μA
Accuracy: ±(1.0% + 5 dgts) **Voltage burden:** 1V
Overload Protection: 600VDC or 600VAC rms



Frequency (Hz) Through Leads

Check variable frequency drives. Check incoming voltages to ensure they are cycling at 60Hz or desired frequency. Select VAC/Hz and press SEL button.

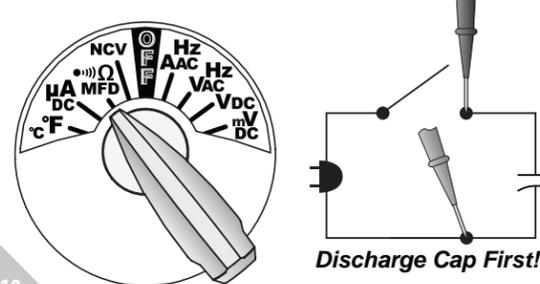
Ranges: 20 to 400Hz **Resolution:** 0.1Hz
Accuracy: ±(0.5% + 5)
Sensitivity: 5V rms on VAC range.



Capacitance (MFD)

Capacitors are one of the most failure prone components in a HVAC/R system. Set to MFD/Ω to test motor start and run capacitors. Discharge the capacitor and disconnect from power and resistors between terminals before testing.

Ranges: 0 to 1000μF **Resolution:** 0.1μF
Accuracy: ±5% + 15 dgts
Overload Protection: 600VDC or 600VAC rms



Amps AC (AAC) TrueRMS (50-60Hz)

Test any isolated power line. Select AAC/Hz dial position.

Ranges: 0 to 400AAC **Resolution:** 0.1A **Crest factor:** ≤ 3

Accuracy: $\pm(2.0\% + 5\text{dpts})$ 50-60Hz

Jaw Opening: 1.2in (30 mm) **Overload Protection:** 400AAC

Frequency (Hz) Through Clamp

Measure frequency without using test leads, just use the clamp.

Turn dial to AAC/Hz and press SEL. Clamp Hz will be displayed.

Range: 20Hz to 400Hz **Accuracy:** $\pm(0.5\% + 5)$

Minimum current range: $> 5\text{AAC}$ at 20 to 100Hz, $> 10\text{AAC}$ at 100

to 400Hz **Resolution:** 0.1Hz **Overload Protection:** 400AAC

Resistance (Ω)

Used for "ohming out" a motor. 0.1 Ω resolution is necessary to test the resistance between the motor poles because the values are typically very low. Select MFD/ Ω and press SEL button once.

Ranges: 0 to 1000 Ω , 1000 Ω to 9999 Ω

Resolution: 0.1 Ω **Overload Protection:** 600VDC/VAC rms

Accuracy: $\pm(1.5\% + 5)$

Continuity (\bullet)

Use the continuity feature to test if a circuit is open or closed. Use this feature to check fuses as well. A steady "beep" and green LED indicate the circuit is good. Select MFD/ Ω / \bullet and press SEL twice.

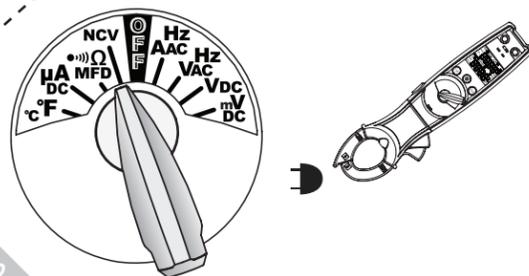
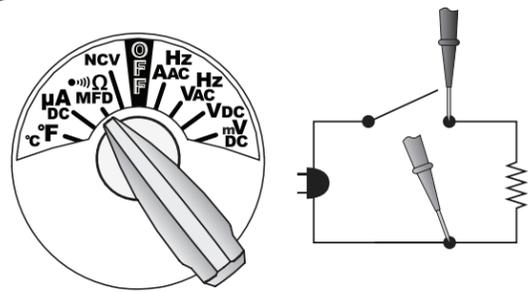
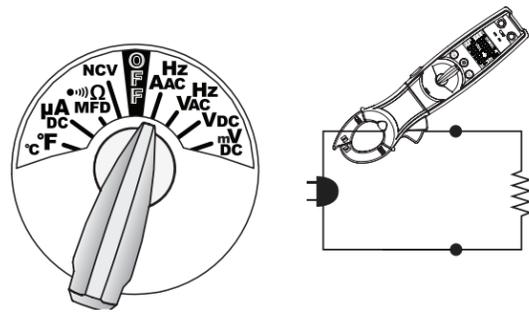
Range: 1000 Ω **Resolution:** 0.1 Ω **Response time:** 100ms

Audible beep: $< 30\Omega$ **Overload Protection:** 600VDC/VAC rms

Non Contact Voltage (NCV)

Use the non contact voltage (NCV) feature to test if a wire is hot or not. Always test on a known live source before using. A red LED blinks and beeping sound is emitted at voltages $> 24\text{VAC}$

AC Voltage Detection Range: 24VAC to 600VAC (50-60Hz)



Temperature ($^{\circ}\text{F}/^{\circ}\text{C}$)

Plug any K-type thermocouple directly into the meter to measure temperature. Cold junction is located inside the meter and allows for extremely accurate measurements even in rapidly changing ambient temperatures (going from rooftop to freezer). No adapter is required. See Temp Calibration section for calibration instructions.

Range: -40°F to 2200°F , (-40°C to 1200°C) **Resolution:** 0.1 $^{\circ}$

Accuracy: $\pm(1^{\circ}\text{F})$ 32°F to 120°F , $\pm(1^{\circ}\text{C})$ 0°C to 49°C

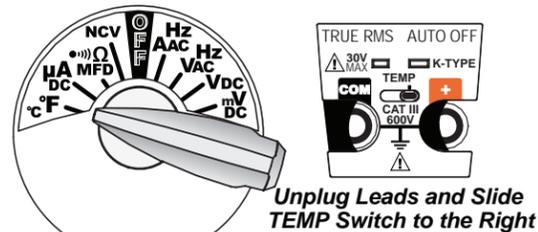
$\pm(1\%+2^{\circ}\text{F})$ 120°F to 750°F , $\pm(1\%+1^{\circ}\text{C})$ 49°C to 400°C

$\pm(2\%+6^{\circ}\text{F})$ -40°F to 32°F , $\pm(2\%+3^{\circ}\text{C})$ -40°C to 0°C

$\pm(2\%+6^{\circ}\text{F})$ 750°F to 2200°F , $\pm(2\%+3^{\circ}\text{C})$ 400°C to 1200°C

Sensor type: K-type thermocouple

Overload protection: 30 VDC or 30VAC rms

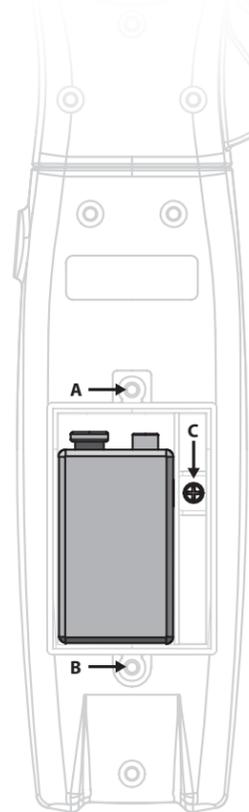


Unplug Leads and Slide TEMP Switch to the Right

Temp. Calibration

For accuracies of $\pm 1^{\circ}\text{F}$, calibrate to a known temperature. A glass of stabilized ice water is very close to 32°F (0°C) and is usually very convenient but any known temperature can be used.

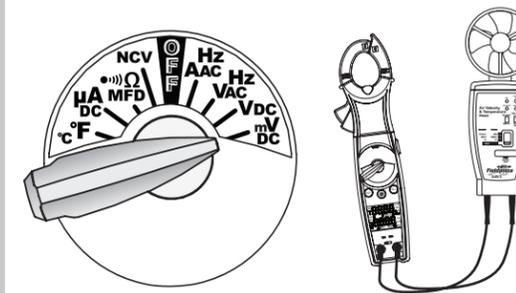
1. Select the $^{\circ}\text{F}/^{\circ}\text{C}$ range.
2. Plug thermocouple to be calibrated into the K-type jack.
3. Unscrew A and B and remove the battery cover.
4. Stabilize a large cup of ice water. Stir the ice with the water until temperature stays at 32°F (0°C).
5. Immerse the thermocouple probe and let it stabilize. Keep stirring to prevent micro-environments.
6. Use a small screwdriver to adjust calibration pot C to the right of the battery as close to 32°F as you would like.



Modular Expandability

Your Swivel Clamp Meter is compatible with all Fieldpiece Accessory Heads. With Fieldpiece Accessory Heads, you can measure any available parameter, and read the measurement on your meter's display in real-time.

Just set the range to mVDC. Pressing SEL changes the mV range. Remove the probe tips of your test leads, and connect your accessory head (model AAV3 shown).



Visit www.fieldpiece.com to see all of the different accessory heads that Fieldpiece offers.

Safety Features

1. Bright LED and beeper warn you when testing voltages above 30V.
2. Switch to the NCV function (non contact voltage) and point clamp claw towards suspected voltage source. Monitor the bright LED and beeper to see if the source is "hot."
3. Rotate the clamp to the angle that best suits the situation.
4. Temp switch to prevent leaving thermocouple plugged in while measuring voltage.

Battery Replacement

The battery must be replaced when the battery icon is empty. "bAtt" will display with a beeping sound. Meter will shut off in 5 seconds. Disconnect and unplug leads, turn meter off and remove battery cover.

Safety Information

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

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

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 $^{\circ}\text{F}$. (Use only k-type thermocouples) REMOVE THE THERMOCOUPLE when taking voltage measurements. DISCONNECT TEST LEADS when measuring temperature. DO NOT APPLY VOLTAGE TO THE JACKS when the rotary dial is on microamps. Even low voltages can cause a current overload and potentially harm the meter.

Maintenance

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

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

Call Fieldpiece Instruments for one-price-fix-all out-of-warranty service pricing. Send check or money order for the amount quoted. Send the meter freight prepaid to Fieldpiece Instruments. Send proof of date and location of purchase for in-warranty service. The meter will be repaired or replaced, at the option of Fieldpiece, and returned via least cost transportation.

Fieldpiece
Designed in USA
MADE IN TAIWAN

www.fieldpiece.com

© Fieldpiece Instruments, Inc 2012; v04