

TECHNICAL DATA

# Fluke 324 True-RMS Clamp Meter with Temperature & Capacitance



## Key features

"It does everything a HVAC or Maintenance Tech would need. Out of 12 guys I work with 9 of them had the 324" - Thomas

- Rugged, reliable basic True-RMS clamp meter
- Measure AC current up to 400 A, AC/DC voltage to 600V
- Measure resistance up to 4kΩ, continuity detection  $\leq 30\Omega$
- Additions from 323 Clamp: Temperature, Capacitance, Backlight

## Product overview: Fluke 324 True-RMS Clamp Meter with Temperature & Capacitance

The Fluke 324 True-RMS Clamp Meter is a reliable, solid troubleshooting tool for commercial and residential electricians, featuring True-RMS measurements, a slim design for easy transport and use, and a large display for efficient troubleshooting. With the addition of Temperature and Capacitance, it has everything an HVAC technician could need.

## Troubleshoot problems safely and accurately

- CAT III 600 V, CAT IV 300 V safety rating
- Provides True RMS AC voltage and current for accurate measurements on non-linear signals



- Measures AC current up to 400 A
- Measures AC/DC voltage to 600V
- Measures resistance to 4kΩ with continuity detection  $\leq 30\Omega$
- Measures temperature from -10C to 400C
- Measures capacitance to 1000μF
- Backlight and hold function captures a reading on the display
- Comes with a two-year warranty and soft carrying case

## Fluke 320 Series Clamp Meters for electrical troubleshooting



Fluke 323 True-RMS Clamp Meter

Fluke 324 True-RMS Clamp Meter

Fluke 325 True-RMS Clamp Meter

AC Current	400A	40A / 400A	40A / 400A
DC Current			40A / 400A
AC/DC Voltage	600V	600V	600V
Resistance	400Ω / 4kΩ	400Ω / 4kΩ	400Ω / 4kΩ / 40kΩ
Continuity	$\leq 70\Omega$	$\leq 30\Omega$	$\leq 30\Omega$
Capacitance		100μF / 1000μF	100μF / 1000μF
Temperature		-10C to 400C	-10C to 400C
Backlight		Yes	Yes
Frequency			5Hz to 500Hz
Min/Max			Yes

### Contents:

- Fluke 324 True-RMS Clamp Meter
- TL75 Test Leads
- Type K Thermocouple
- Two AAA Batteries (Installed)
- Soft Case

## Specifications: Fluke 324 True-RMS Clamp Meter with Temperature & Capacitance

### Specifications

AC current	<b>Range</b>	40.00 A / 400.0 A
	Accuracy	1.5% ± 5 digits (45 Hz to 400 Hz) Note: Add 2% for position sensitivity
DC current	<b>Range</b>	-
	Accuracy	-
AC voltage	<b>Range</b>	600.0 V
	Accuracy	1.5% ± 5 digits
DC voltage	<b>Range</b>	600.0 V
	Accuracy	1.0% ± 5 digits
Resistance	<b>Range</b>	400.0 Ω / 4000 Ω
	Accuracy	1.0% ± 5 digits
Continuity		≤ 30 Ω
Capacitance		0 to 100.0 μF / 100μF to 1000 μF
Frequency		-
AC response		True-RMS
Backlight		Yes
Data hold		Yes
Contact temperature		-10.0°C to 400.0°C (14.0°F to 752.0°F)
Min/Max		-
Size	<b>H x W x D (mm)</b>	207 x 75 x 34
	Max wire diameter	30 mm (600 MCM)
	Weight	208 g
Category rating		CAT III 600 V CAT IV 300 V
Warranty		Two-year

## Ordering information



### Fluke 324

Fluke 324 True-RMS Clamp Meter

Includes:

- Fluke 324 True-RMS Clamp Meter
- TL75 Test Leads
- Type K Thermocouple
- Two AAA Batteries (Installed)
- Soft Case

### R-FLUKE-324

Fluke 324 True-RMS Clamp Meter with Temperature & Capacitance, fully reconditioned to original factory specifications. Includes Fluke's 2 year product warranty.

#### Optional accessories

**Fluke TL75 Hard Point™ Test Lead Set**

#### Description

PVC-insulated, right-angle shrouded 4 mm (0.16 in) banana plugs

**Fluke TL175 TwistGuard™ Test Leads**

Simply twist to change the exposed probe tip length.

**Fluke TLK-225 SureGrip™ Master Accessory Set**

Includes all the SureGrip™ leads and probes in a handy six-pocket, roll-up pouch, along with TL224 test leads.

**Fluke insulated hand tools starter kit**

8-piece kit has the most popular screwdrivers, pliers and cutters.

TECHNICAL DATA

# Fluke IRR1-SOL Solar Irradiance Meter



**HIGH PRECISION MONO-CRYSTALLINE SOLAR SENSOR**

Instantaneous irradiance measurements up to 1400 W/m<sup>2</sup>

**TWO OPTIONS FOR TEMPERATURE MEASUREMENT**

Use the built-in temperature sensor or the external suction mount temperature probe to measure ambient and panel temperature

**INTEGRATED COMPASS**

Measure and document roof or site orientation

**INCLINATION SENSOR**

Know roof and PV panel tilt when surveying, installing, or adjusting the installation

**Make the critical measurements needed for installing, testing, maintaining, and reporting on solar panels or photovoltaic systems with one, easy-to-use tool.**

The Fluke IRR1-SOL Irradiance Meter has been designed from the ground up to simplify the installation, commissioning, and troubleshooting of photovoltaic arrays, measuring irradiance, temperature, inclination and direction of the solar array in a single handheld tool. With a rugged, compact design, a protective carrying case, and an easy-to-read, high-contrast LCD screen to read measurements in direct sunlight, the IRR1-SOL can go where you go. The simple user interface, instantaneous solar irradiation measurements and built-in temperature sensor make it easy to meet the IEC 62446-1 requirements for testing, documenting, and maintaining photovoltaic systems. Additionally, the integrated compass and inclination sensor allow you to quickly measure and document roof and site orientation, pitch, and panel tilt while surveying, installing, or adjusting an installation.

Whether working on a roof-mounted system or on a large field installation, the IRR1-SOL is the single-handed solution that every solar installer and technician needs in their tool bag.

**Use the IRR1-SOL for:**

**Photovoltaic system design and surveying**

To find the expected production at a site, determine your solar resource while taking shading into account. The solar resource is measured in peak sun hours: the number of hours per day with 1,000 watts generated per square meter of solar array. Location, time of day, season, and weather conditions all influence peak sun hours. Use the Fluke IRR1-SOL to determine the actual solar irradiance (Watts/m<sup>2</sup>) and shading at the site to develop a baseline.

**Measuring**

Once your system is installed, make sure it is operating as designed by measuring its electrical characteristics and the actual power output of the array. The performance of a photovoltaic array is based on its current-voltage (IV) curve. Use the IRR1-SOL to obtain the amount of solar irradiance necessary to calculate the IV curve of the power output.

**Comparing and diagnosing**

Even when installed correctly, a photovoltaic system may not be producing the expected electrical output. In order to produce the expected output the system needs to receive the correct amount of irradiance energy to generate the DC voltage that is fed into the inverter.

## Specifications

Irradiance	
Measuring Range	0 to 1400 W/m <sup>2</sup>
Resolution	1 W/m <sup>2</sup>
Measuring Accuracy	± (5 % + 5 Digit)
Temperature Measurement	
Measuring range (°C)	-22 °F to 212 °F (-30 °C to 100 °C)
Resolution	0.2 °F (0.1 °C) / 1 °F @ > 100 °F
Measuring Accuracy	±2 °F (±1 °C) @ 14 °F to 167 °F (-10 °C to 75 °C), ±4 °F (±2 °C) @ -22 °F to 14 °F (-30 °C to -10 °C) and 167 °F to 212 °F (75 °C to 100 °C)
Note: Temperature measurement response time: ~30 sec.	
Inclination Angle	
Measuring Range	-90° to +90°
Resolution	0.1°
Measuring Accuracy	± 1.5° @ -50° to +50°, ±2.5° @ -85° to -50° and +50° to +85° ±3.5° @ -90° to -85° and +85° to +90°
Compass	
Measuring Range	0° to 360°
Resolution	1°
Measuring Accuracy	± 7°
Note: a) Measurements valid for device inclination between -20° and +20° to horizontal. Outside that range on LCD will be shown "----". b) Result is referred to magnetic north.	
Temperature	
Operating Temperature IRR1-SOL	-20 °C to 50 °C (humidity <80 %), noncondensing
Operating Temperature 8OPR-IRR	-30 °C to 100 °C
Storage Temperature	-30 °C to 60 °C (humidity <80 %)
Altitude	0 m to max. 2000 m
Electromagnetic Compatibility (EMC)	
International	IEC 61326-1: Portable Electromagnetic Environment CISPR 11: Group 1, Class A Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for radio frequency energy that is necessary for the internal function of the equipment itself. Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances. Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.



**Specifications continued**

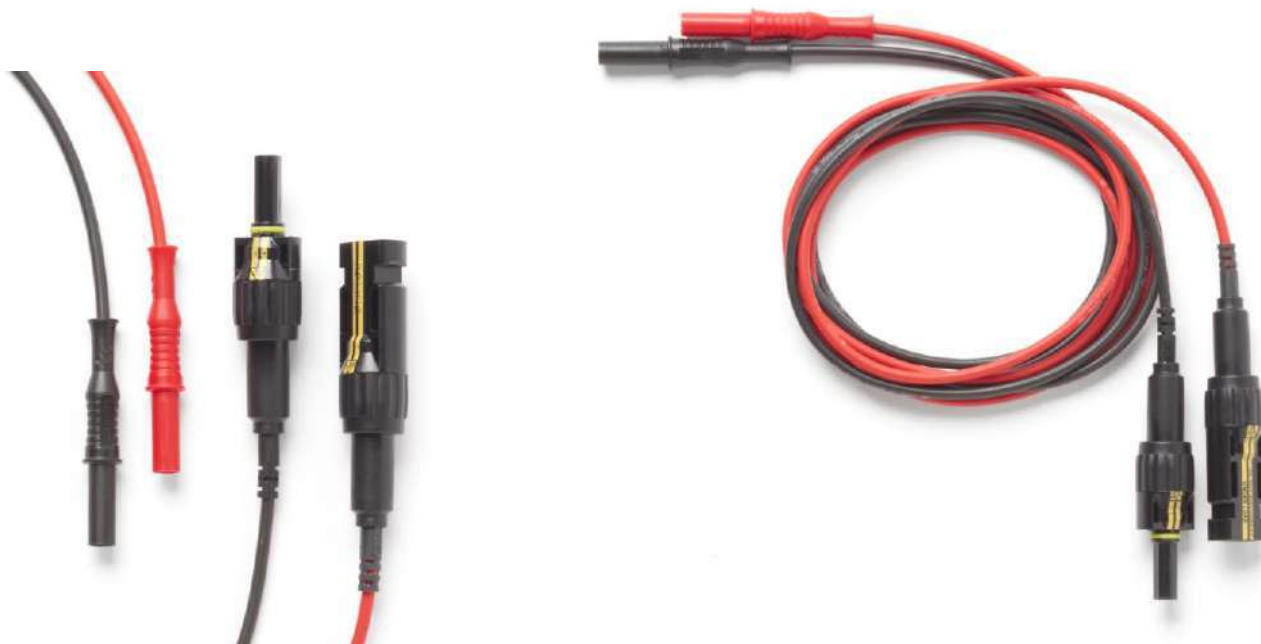
Korea (KCC)	Class A Equipment (Industrial Broadcasting & Communication Equipment) Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.
USA (FCC)	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.
<b>Protection</b>	
IP Protection	IP40
<b>Power Supply &amp; Battery Life</b>	
Batteries	4 AA Alkaline Batteries
Battery Life (typical)	50 hours (> 9000 readings)
Auto Power Off	30 minutes
<b>Dimensions</b>	
L x W x H	5.90 x 3.14 x 1.37 in (150 x 80 x 35 mm)
Weight	0.5 lb (231 g)

**Ordering information**

**Fluke IRR1-SOL Solar Irradiance Meter**

Includes: FLK-IRR1-SOL Solar Irradiance Meter, FLK-80PR-IRR External Temperature Probe with Suction Cup, C250 Carrying Case with Shoulder Strap, (4) AA Alkaline Batteries, User Manual.



**Model PVLEAD1**  
**Solar MC4 to 4mm Test Lead Set****Features**

- Set of black and red MC4 to 4mm adapter test leads for solar applications
- The black lead is a MC4 (female) to 4mm sheathed banana plug on a 60-inch test lead
- The red lead is a MC4 (male) to 4mm sheathed banana plug on a 60-inch test lead
- Allows for connections to test tools that accept 4mm sheathed banana plugs
- Ensures safe current and voltage measurements on Photovoltaic (PV) modules and systems
- Connect measuring devices to PV power plants, for use in regular tests, measurements, and troubleshooting on solar PV panels
- Nickel plated contacts

**Ratings**

Voltage: Complies to IEC / EN 61010-031  
CAT III 1000V / CAT IV 600V  
Do Not Disconnect Under Load

Current: 20A

Temperature Range: +5°C to +40°C (+41°F to +104°F)

**Ordering Information**

Model: PVLEAD1

MC4 TO 4MM TEST LEAD SET, BLACK/RED

All dimensions are in inches. Tolerances (except noted): .xx = ±.02" (.51 mm),  
.xxx = ±.005" (.127 mm). All specifications are to the latest revisions.  
Specifications are subject to change without notice. Registered trademarks are  
the property of their respective companies.