TECHNICAL DATA

Fluke 1660 Series Multifunction Installation Testers

The new Fluke 1660 Series Installation Testers are the only installation testers that help prevent damage to connected appliances and also allow users to send test results wirelessly via smartphone directly from the field.

FLUKE CONNECT

FLUKE CONNECT COMPATIBLE (1664 FC ONLY)
View test results on your smartphone via Fluke Connect® mobile app and Data Management Software (Fluke DMS, sold separately). Download the free Fluke Connect app to enable wireless data transmission and Fluke Cloud™ storage.

INSULATION PRETEST (1664 FC ONLY)
The new Fluke 1660 Series Installation Testers are the only installation testers that help prevent damage to connected appliances.

AUTO TEST SEQUENCE (1664 FC ONLY)
Start a sequence of seven critical tests with one press of the TEST button.

HEAVY DUTY, SINGLE INPUT LINE CORD
Guards against failures in the field.

WARRANTY
Three-year standard warranty.

Reduce test time up to 40% with Auto Test

Auto Test does 5 required installation tests in one sequence, including selectable Type A, AC & RCD Auto Test, ensuring compliance with local installation regulations. It reduces the number of manual connections, decreases the possibility of making errors and reduces test time up to 40% from previous Fluke models.

Insulation PreTest

Protect the installation. Avoid costly mistakes.

The Fluke 1664 FC Installation Tester is the only installation with "Insulation PreTest," which warns you about potentially serious and costly mistakes. If the tester detects that appliances are connected to the system during test, it will stop the insulation test and provide a visual and audible warning. This helps eliminate accidental damage to peripheral equipment and keeps your customers happy.

Fluke Connect®, ShareLive™ calling and Fluke Cloud™ storage

Share from anywhere

Save time—eliminate data entry by wirelessly syncing measurements directly from your installation tester and share with your team using the Fluke Connect system. Having access to measurements simultaneous at the inspection site and from the office or an off-site location enables faster decision making and real time collaboration between team members.

Fluke Cloud™ storage

Retrieve stored results from anywhere

Cloud storage allows you to retrieve stored results whether you are in the office or in the field to make decisions in real time. Fluke Connect uses radio-enabled test tools and a mobile app to transfer measurements straight from the field to a secure cloud location, where the data can be accessed by team members. Plus you can import the data into Fluke DMS to process and generate certificates.

Key product capabilities

The 1660 Series testers verify the safety of electrical installations in domestic, commercial and industrial applications. They can ensure that fixed wiring is safe and correctly installed to meet the requirements of IEC 60364 and all relevant local standards.

Fluke 1664 FC

The Fluke 1664 FC is the only installation tester that protects connected appliances from damage during insulation tests, and allows you to share your test results wirelessly by smartphone with coworkers or customers. Fluke's patented Insulation PreTest stops you from performing tests with appliances that are connected to the system during test. This helps eliminate accidental damage and keeps your customers happy.

In addition, the Fluke 1664 FC offers you the power of Fluke Connect. Now you can send test results straight from your Fluke 1664 FC to your smartphone, and transmit those results to other members of your team. You can get feedback, suggestions and even have work orders sent to your job site.

You can also save your test results to Fluke Cloud™ storage. No more writing down data on paper with the possibility of transcription errors. Cloud storage gives you a fast, secure and accurate way to storing all your test data and create test certificates with Fluke DMS.

Fluke 1663

The ideal tester for professional trouble-shooters. This instrument is ideal for professional users–high-end functionality, advanced measurement capability, yet it is still easy to use. Operation is intuitive and easily mastered by all levels of field workers.

Fluke 1662

A solid, basic installation tester. The Fluke 1662 gives you Fluke reliability, simple operation and all the testing power you need for basic installation testing.

Features by model

Measurement function	1662	1663	1664 FC
Insulation-PreTest™ safety function **NEW**			•
Insulation at L-N, L-PE, N-PE inputs **NEW**			•
Auto Test sequence **NEW**			•
Loop and line resistance—mΩ resolution			•
Continuity at L-N, L-PE, N-PE inputs **NEW**		•	•
Test smooth dc sensitive RCDs (Type B/B+)		•	•
Earth resistance		•	•
Voltage trms (ac and dc) and frequency	•	•	•
Wiring polarity checker, detects broken PE and N wires	•	•	•
Insulation resistance	•	•	•
Continuity and resistance	•	•	•
Measure motor windings with continuity test (@ 10 mA)	•	•	•
Loop and line resistance	•	•	•
Prospective Earth Fault Current (PEFC/IK)	•	•	•
Prospective Short-Circuit Current (PSC/IK)	•	•	•
RCD trip time	•	•	•
RCD trip current (ramp test)	•	•	•
Measures trip time and current for RCD type A and AC in one test	•	•	•
RCD variable test current	•	•	•
Automatic RCD test sequence	•	•	•
Phase sequence test	•	•	•

Other features	1662	1663	1664 FC
Fluke Connect® compatibility **NEW**			•
ShareLive™ calling **NEW**			•
Fluke Cloud™ storage **NEW**			•
On/Off switchable Auto Start for RCD and Looptest **NEW**	•	•	•
Self-test	•	•	•
Illuminated display	•	•	•
Memory, interface			
Z Max memory **NEW**		•	•
Memory		•	•
IR-USB and BLE interface (use with optional Fluke DMS software and FVF)		IR-USB	IR-USB/BLE

Included Accessories			
Heavy duty mains cord with single input connector **NEW**	•	•	•
Hard case	•	•	•
Remote control probe	•	•	•
Zero adapter	•	•	•

General specifications

Specification	Characteristic
Size	10 cm (L) x 25 cm (W) x 12.5 cm (H)
Weight (incl. batteries)	approx. 1.3 kg
Battery size, quantity	1.5 V type AA (IEC LR6), 6 pcs.
Sealing	IP 40
Safety	Complies with IEC/EN61010-1, UL61010, ANSI/ISA –s82.02.01 and CAN/CSA c22.2 No. 1010
Overvoltage	CAT III 500 V, CAT IV 300 V
Performance	EC/EN61557-1 to IEC/EN61557-7 and IEC/EN61557-10

AC and DC voltage measurement trms

Range	Resolution	Input Impedance	Overload Protection
500 V	0.1 V	3.3 MΩ	660 V rms

Continuity testing (R_{LO})

Range (Autoranging)	Resolution	Open Circuit Voltage
20 Ω/200 Ω/2000 Ω	0.01 Ω/0.1 Ω/1 Ω	> 4 V

Insulation resistance measurement (R_{ISO})

Test voltages	
1662	**1663/1664 FC**
100-250-500-1000 V	50-100-250-500-1000 V

Test Voltage	Insulation Resistance Range	Resolution	Test Current
50 V	20 MΩ/50 MΩ	0.01 MΩ/0.1 MΩ	1 mA @ 50 kΩ
100 V	20 MΩ/100 MΩ	0.01 MΩ/0.1 MΩ	1 mA @ 100 kΩ
250 V	20 MΩ/200 MΩ	0.01 MΩ/0.1 MΩ	1 mA @ 250 kΩ
500 V	20 MΩ/200 MΩ/500 MΩ	0.01 MΩ/0.1 MΩ/1 MΩ	1 mA @ 500 kΩ
1000 V	20 MΩ/200 MΩ/1000 MΩ	0.01 MΩ/0.1 MΩ/1 MΩ	1 mA @ 1 MΩ

Insulation pretest

Insulation safety pretest	Requires to connect the Tester to L, N and PE.

Loop and line impedance (Z_L)

Range	Resolution
10 Ω (Hi current mΩ mode)/20 Ω/200 Ω/2000 Ω	1 mΩ/ 0.01 Ω/ 0.1 Ω/1Ω

Prospective earth fault current, PSC test

Range	Resolution
1000 A/10 kA (50 kA)	1 A/0.1 kA

Computation: Prospective Earth Fault Current (PEFC) or Prospective Short Circuit Current (PSC) determined by dividing measured mains voltage by measured loop (L–PE) resistance or line (L–N) resistance, respectively.

RCD testing, RCD types tested

RCD Type		Model 1662	Model 1663/1664 FC
AC[1]	G[2], S[3]	A/F[4], AC[1], G[2], S[3]	A/F, AC, B/B+[5], G, S

[1]Responds to AC. [2]General, no delay. [3]Time delay. [4]Responds to pulsed signal. [5]Responds to smooth DC signal.

RCD trip time test (ΔT)

Current Settings[1]	Multiplier	Measurement Range	
		RCD Type G	RCD Type S
10–30–100–300–500–1000 mA – VAR	x ½, x 1	310 ms	510 ms
10–30–100 mA	x 5	50 ms	160 ms

[1]1000 mA type AC only. 700 mA maximum type A in VAR mode, VAR mode not available for type B.

RCD trip current measurement/ramp test (Index $_{\Delta N}$)

Current Range	Step Size	Dwell Time		Measurement Accuracy
		Type G	Type S	
30 % to 110 % of RCD rated current[1]	10 % of index $I_{\Delta N}$[2]	300 ms/step	500 ms/step	± 5 %
Notes 30 % to 210 % for Type A $I_{\Delta N}$ = 10mA 20 % to 210 % for Type B		**Specified trip current ranges (EN 61008-1):** 50 % to 100 % for Type AC 35 % to 140 % for Type A (>10 mA) 35 % to 200 % for Type A (≤10 mA) 50 % to 200 % for Type B		

[1]30 % to 150 % for Type A $I_{\Delta N}$ > 10 mA. [2]5 % for Type B

Earth resistance test (RE) Model 1664 FC and 1663 only

Range	Resolution	Frequency	Output Voltage
200 Ω/2000 Ω	0.1 Ω/1Ω	128 Hz	25 V

Phase sequence indicaton

Icon	Range	Display
Phase Sequence indicator is active	100 to 500 V	"1-2-3": or "3-2-1"

Included Accessories
6x AA (IEC LR6) cell batteries, C1600 hard carrying case, zero adapter, heavy duty mains cord, STD standard test lead set, padded carrying and waist strap, quick reference guide, TP165X remote control probe and lead set (FTP/UK fused probes, UK only), User's manual on CD-ROM

Ordering Information
Fluke 1664 FC Multifunction Installation Tester with Auto Test, Insulation PreTest, Fluke Connect® compatibility

Fluke 1663 Multifunction Installation Tester

Fluke 1662 Multifunction Installation Tester

Preventive maintenance simplified. Rework eliminated.

Save time and improve the reliability of your maintenance data by wirelessly syncing measurements using the Fluke Connect® system.

- Eliminate data-entry errors by saving measurements directly from the tool and associating them with the work order, report or asset record.
- Maximize uptime and make confident maintenance decisions with data you can trust and trace.
- Access baseline, historical and current measurements by asset.
- Move away from clipboards, notebooks and multiple spreadsheets with a wireless one-step measurement transfer.
- Share your measurement data using ShareLive™ video calls and emails.
- **Fluke 1664 FC** is part of a growing system of connected test tools and equipment maintenance software. Visit the website to learn more about the Fluke Connect® system.

Find out more at **flukeconnect.com**

Download on the App Store

ANDROID APP ON Google Play

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Smartphone wireless service and data plan not included with purchase.
Fluke Connect® is not available in all countries.

Fluke. *Keeping your world up and running.®.*

Fluke Corporation
PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0)40 267 5100 or
Fax +31 (0)40 267 5222
In Canada (800)-36-FLUKE or
Fax (905) 890-6866
From other countries +1 (425) 446-5500 or
Fax +1 (425) 446-5116
Web access: http://www.fluke.com

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FLUKE®

Fluke 114, 115, 116 and 117 Digital Multimeters

Extended specifications

Technical Data

General specifications (all models)

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity of 0 % to 90 %.	
Maximum voltage between any terminal and earth ground	600 V
Surge protection	6 kV peak per IEC 61010-1 600 V CAT III, Pollution Degree 2
Ω Fuse for A input	11 A, 1000 V FAST 17 kA Fuse (Fluke PN 803293)
Display	Digital: 6,000 counts, updates 4/sec; Bar Graph: 33 segments, updates 32/sec
Temperature	Operating: -10 °C to +50 °C; Storage: -40 °C to +60 °C
Humidity	0 % to 90 % to 35 °C; 75 % to 40 °C; 45 % to 50 °C
Temperature coefficient	0.1 x (specified accuracy/°C) (< 18 °C or > 28 °C)
Operating altitude	2,000 meters
Battery	9 Volt Alkaline, NEDA 1604A/IEC 6LR61
Battery life	Alkaline: 400 hours typical, without backlight
Safety compliances	ANSI/ISA 82.02.01 (61010-1) 2004, CAN/CSA C22.2 No 61010-1-04, UL 6101B (2003) and IEC/EN 61010-1 2nd Edition for measurement Category III, 600 V, Pollution Degree 2, EMC EN61326-1
Certifications	UL, CSA, TUV, N10140, VDE
IP rating (dust and water protection)	IP42

Accuracy specifications (all models)

Function	Range	Resolution	Accuracy ± ([% of Reading] + [Counts])		Model
DC millivolts	600.0 mV	0.1 mV	0.5 % + 2		114, 115, 116, 117
DC volts	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	0.5 % + 2		114, 115, 116, 117
			DC, 45 Hz to 500 Hz	**500 Hz to 1 kHz**	
Auto-V LoZ[1] true-rms	600.0 V	0.1 V	2.0 % + 3	4.0 % + 3	114, 116, 117
			45 Hz to 500 Hz	**500 Hz to 1 kHz**	
AC millivolts[1] true-rms	600.0 mV	0.1 mV	1.0 % + 3	2.0 % + 3	114, 115, 116, 117
AC volts[1] true-rms	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	1.0 % + 3	2.0 % + 3	114, 115, 116, 117
Continuity	600 Ω	1 Ω	Beeper on < 20 Ω, off > 250 Ω; detects opens or shorts of 500 µs or longer		114, 115, 116, 117
Ohms	600.0 Ω 6.000 kΩ 60.00 kΩ 600.0 kΩ 6.000 MΩ 40.00 MΩ	0.1 Ω 0.001 kΩ 0.01 kΩ 0.1 kΩ 0.001 MΩ 0.01 MΩ	0.9 % + 2 0.9 % + 1 0.9 % + 1 0.9 % + 1 0.9 % + 1 1.5 % + 2		114, 115, 116, 117
Diode test	2.000 V	0.001 V	0.9 % + 2		115, 116, 117
Capacitance	1000 nF 10.00 µF 100.0 µF 9999 µF	1 nF 0.01 µF 0.1 µF 1 µF	1.9 % + 2 1.9 % + 2 1.9 % + 2 100 µF to 1000 µF: 1.9 % + 2 > 1000 µF: 5 % + 20		115, 116, 117
LoZ capacitance (power-up option)	1 nF to 500 µF		10 % + 2 typical		115, 116, 117

[1] All ac ranges except Auto-V LoZ are specified from 1 % to 100 % of range. Auto-V LoZ is specified from 0.0 V. Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display non-zero readings when the test leads are disconnected from a circuit or are shorted together. For volts, crest factor of ≤ 3 at 4000 counts, decreasing linearly to 1.5 at full scale. For amps, crest factor of ≤ 3. AC volts is ac-coupled. Auto-V LoZ, ac mV, and ac amps are dc-coupled.

Accuracy specifications (all models) cont.

Function	Range	Resolution	Accuracy ± ([% of Reading] + [Counts])	Model
Temperature (K-Type thermocouple)	-40 °C to 400 °C -40 °F to 752 °F	0.1 °C 0.2 °F	1 % + 10[2] 1 % + 18[2]	116
AC amps true-rms[1] (45 Hz to 500 Hz)	6.000 A 10.00 A 20 A overload for 30 seconds maximum	0.001 A 0.01 A	1.5 % + 3	115, 117
AC µAmps true-rms[1] (45 Hz to 1 kHz)	600.0 µA	0.1 µA	1.5 % + 3 (2.5 % + 3 > 500 Hz)	116
DC amps	6.000 A 10.00 A 20 A overload for 30 seconds maximum	0.001 A 0.01 A	1.0 % + 3	115, 117
DC µAmps true-rms	600.0 µA	0.1 µA	1.0 % + 2	116
Hz (V or A input)[2]	99.99 Hz 999.9 Hz 9.999 kHz 50.00 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 2	115, 117
Hz (V input)[3]	99.99 Hz 999.9 Hz 9.999 kHz 50.00 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 2	116

[1] All ac ranges except Auto-V LoZ are specified from 1 % to 100 % of range. Auto-V LoZ is specified from 0.0 V. Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display non-zero readings when the test leads are disconnected from a circuit or are shorted together. For volts, crest factor of ≤ 3 at 4000 counts, decreasing linearly to 1.5 at full scale. For amps, crest factor of ≤ 3. AC volts is ac-coupled. Auto-V LoZ, ac mV, and ac amps are dc-coupled.

[2] AC Volts Hz is ac-coupled and specified from 5 Hz to 50 kHz. AC Amps Hz is dc-coupled and specified from 45 Hz to 5 kHz. Amps input burden voltage (typical): 6 A input 2 mV/A, 10 A input 37 mV/A.

[3] Frequency is ac-coupled, 45 Hz to 50 kHz.

Frequency counter sensitivity (models 115, 116, 117)

Input range		Typical sensitivity (rms sine wave)			
		5 Hz to 45 Hz	45 Hz to 5 kHz	5 kHz to 10 kHz	10 kHz to 50 kHz
Volts AC	6 V 60 V 600 V	0.2 V 2 V 20 V	0.2 V to 0.3 V 2 V to 3 V 20 V to 30 V	0.3 V to 0.4 V 3 V to 4 V 30 V to 40 V	0.4 V to 1.0 V 4 V to 10 V 40 V to 100 V
AC Amps (115, 117 only)	6 A 10 A	N/A N/A	0.4 A 0.5 A	N/A N/A	N/A N/A

Input characteristics (all models)

Function	Input impedance (nominal)	Common mode rejection ratio(1 kΩ unbalanced)		Normal mode rejection
Volts AC	> 5 MΩ < 100 pF	> 60 dB at dc, 50 or 60 Hz		
Volts DC	> 10 MΩ < 100 pF	> 100 dB at dc, 50 or 60 Hz		> 60 dB at 50 or 60 Hz
Auto-V LoZ	~3 kΩ < 500 pF	> 60 dB at dc, 50 or 60 Hz		
	Open circuit test voltage	**Full scale voltage**		**Short circuit current**
Ohms	< 2.7 V dc	**To 6.0 MΩ**	**40 MΩ**	< 350 µA
		< 0.7 V dc	< 0.9 V dc	
Diode Test	< 2.7 V dc	2.000 V dc		< 1.2 mA

Fluke. *Keeping your world up and running.™*

Fluke Corporation
PO Box 9090, Everett, WA USA 98206

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or
Fax +31 (0) 40 2675 222
In Canada (800)-36-FLUKE or
Fax (905) 890-6866
From other countries +1 (425) 446-5500 or
Fax +1 (425) 446-5116
Web access: http://www.fluke.com

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