FLUKE®

1507/1503
Insulation Testers

Technical Data

The Fluke 1507 and 1503 Insulation Testers are compact, rugged, reliable, and easy to use. With their multiple test voltages, they are ideal for many troubleshooting, commissioning, and preventative maintenance applications. Additional features, like the remote probe on these tools save both time and money when performing tests.

Features and benefits:

- Insulation test range:
  - 1507: 0.01 MΩ to 10 GΩ
  - 1503: 0.1 MΩ to 2000 MΩ
- Insulation test voltages:
  - 1507: 50 V, 100 V, 250 V, 500 V, 1000 V
  - 1503: 500 V, 1000 V
- Save both time and money with Automatic calculation of Polarization Index and Dielectric Absorption Ratio
- Make repetitive tests simple and easy with the 1507's Compare (Pass/Fail) function (only available on the 1507)
- Repetitive or hard-to-reach testing is easy with the remote test probe
- Live circuit detection prevents insulation test if voltage > 30 V is detected for added user protection
- Auto-discharge of capacitive voltage for added user protection
- AC/DC voltage: 0.1 V to 600 V
- 200 mA Continuity
- Resistance: 0.01 Ω to 20.00 KΩ
- Save battery power with auto power off
- Read measurements easily with large, backlit display
- CAT IV 600 V overvoltage category rating for added user protection
- Remote probe, test leads, probes and alligator clips included with each tester
- Accepts optional Fluke TPAK magnetic hanging system to free your hands for other work
- Four AA alkaline batteries (NEDA 15 A or IEC LR6) for at least 1000 insulation tests
- One-year warranty

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1507/1503 Specifications

AC/DC voltage measurement

Accuracy

Range	Resolution	50 Hz to 400 Hz ± (% of Rdg + Digits)
600.0 V	0.1 V	± (2 % + 3)

Input impedance: 3 MΩ (nominal), < 100 pF
Common mode rejection ratio (1 kΩ unbalanced): > 60 dB at dc, 50 or 60 Hz
Overload protection: 600 V rms or dc

Earth bond resistance measurement

Range	Resolution	Accuracy[1] + (% of Rdg + Digits)
20.00 Ω	0.01 Ω	± (1.5 % + 3)
200.0 Ω	0.1 Ω	
2000 Ω	1 Ω	
20.00 kΩ	0.01 kΩ	

[1]Accuracies apply from 0 to 100 % of range.

Overload protection: 2 V rms or dc
Open circuit test voltage: > 4.0 V, < 8 V
Short circuit current: > 200.0 mA

Insulation specifications

Measurement range: 0.01 MΩ to 10 GΩ model 1507, 0.01 MΩ to 2000 MΩ model 1503
Test voltages: 50 V, 100 V, 250 V, 500 V, 1000 V
Test voltage accuracy: + 20 %, - 0 %
Short-circuit test current: 1 mA nominal
Auto discharge: Discharge time < 0.5 second for C = 1 µF or less
Live circuit detection: Inhibit test if terminal voltage > 30 V prior to initialization of test
Maximum capacitive load: Operable with up to 1 µF load

Accuracy (Model 1507)

Output Voltage	Display Range	Resolution	Test Current	Accuracy ± (% of Rdg + Digits)
50 V (0 % to + 20 %)	0.01 MΩ to 20.00 MΩ	0.01 MΩ	1 mA @ 50 kΩ	± (3 % + 5)
	20.0 MΩ to 50.0 MΩ	0.1 MΩ		
100 V (0 % to + 20 %)	0.01 MΩ to 20.00 MΩ	0.01 MΩ	1 mA @ 100 kΩ	± (3 % + 5)
	20.0 MΩ to 100.0 MΩ	0.1 MΩ		
250 V (0 % to + 20 %)	0.01 MΩ to 20.00 MΩ	0.01 MΩ	1 mA @ 250 kΩ	± (1.5 % + 5)
	20.0 MΩ to 200.0 MΩ	0.1 MΩ		
500 V (0 % to + 20 %)	0.01 MΩ to 20.00 MΩ	0.01 MΩ	1 mA @ 500 kΩ	± (1.5 % + 5)
	20.0 MΩ to 200.0 MΩ	0.1 MΩ		
	200 MΩ to 500 MΩ	1 MΩ		
1000 V (0 % to + 20 %)	0.1 MΩ to 200.0 MΩ	0.1 MΩ	1 mA @ 1 MΩ	± (1.5 % + 5)
	200 MΩ to 2000 MΩ	1 MΩ		
	2.0 GΩ to 10.0 GΩ	0.1 GΩ		± (10 % + 3)

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Accuracy (Model 1503)

Output Voltage	Display Range	Resolution	Test Current	Accuracy ± (% of Rdg + Digits)
500 V (0 % to + 20 %)	0.1 MΩ to 20.00 MΩ	0.01 MΩ	1 mA @ 500 kΩ	± (2.0 % + 5)
	20.0 MΩ to 200.0 MΩ	0.1 MΩ		
	200 MΩ to 500 MΩ	1 MΩ		
1000 V (0 % to + 20 %)	0.1 MΩ to 200.0 MΩ	0.1 MΩ	1 mA @ 1 MΩ	± (2.0 % + 5)
	200 MΩ to 2000 MΩ	1 MΩ		

EN61557 Specifications

The following tables are a requirement for European labeling.

Measurement	Intrinsic Uncertainty	Operating Uncertainty[1]
Volts	± (2.0 % + 3)	30 %
Earth Bond Resistance	± (1.5 % + 3)	30 %
Insulation Resistance	Depends on test voltage and range. See Insulation Test specifications.	30 %

[1]This specification comes from the standard and indicates the maximum amount allowable by the standard.

EN61557 influence variables and uncertainties

Earth Bond Resistance Influence Variable	Designation per EN61557	Uncertainty for Insulation Resistance	Uncertainty for Earth Bond Resistance
Supply Voltage	E2	5 %	5 %
Temperature	E3	5 %	5 %

[1]Specification confidence level 99 %.

The following tables can be used to determine the maximum or minimum display values considering maximum instrument operating error per EN61557-1, 5.2.4.

Insulation resistance maximum and minimum display values

50 V		100 V		250 V		500 V		1000 V	
Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value
0.05	0.07	0.05	0.07	0.05	0.07	0.05	0.07		
0.06	0.08	0.06	0.08	0.06	0.08	0.06	0.08		
0.07	0.09	0.07	0.09	0.07	0.09	0.07	0.09		
0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10		
0.09	0.12	0.09	0.12	0.09	0.12	0.09	0.12		
0.1	0.13	0.1	0.13	0.1	0.13	0.1	0.13	0.1	0.1
0.2	0.26	0.2	0.26	0.2	0.26	0.2	0.26	0.2	0.3
0.3	0.39	0.3	0.39	0.3	0.39	0.3	0.39	0.3	0.4
0.4	0.52	0.4	0.52	0.4	0.52	0.4	0.52	0.4	0.5
0.5	0.65	0.5	0.65	0.5	0.65	0.5	0.65	0.5	0.7
0.6	0.78	0.6	0.78	0.6	0.78	0.6	0.78	0.6	0.8
0.7	0.91	0.7	0.91	0.7	0.91	0.7	0.91	0.7	0.9
0.8	1.04	0.8	1.04	0.8	1.04	0.8	1.04	0.8	1.0
0.9	1.17	0.9	1.17	0.9	1.17	0.9	1.17	0.9	1.2
1.0	1.30	1.0	1.30	1.0	1.30	1.0	1.30	1.0	1.3
2.0	2.60	2.0	2.60	2.0	2.60	2.0	2.60	2.0	2.6
3.0	3.90	3.0	3.90	3.0	3.90	3.0	3.90	3.0	3.9
4.0	5.20	4.0	5.20	4.0	5.20	4.0	5.20	4.0	5.2
5.0	6.50	5.0	6.50	5.0	6.50	5.0	6.50	5.0	6.5
6.0	7.80	6.0	7.80	6.0	7.80	6.0	7.80	6.0	7.8

EN61557 Specifications cont.

Insulation resistance maximum and minimum display values cont.

50 V		100 V		250 V		500 V		1000 V	
Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value	Limit Value	Minimum Display Value
7.0	9.10	7.0	9.10	7.0	9.10	7.0	9.10	7.0	9.1
8.0	10.40	8.0	10.40	8.0	10.40	8.0	10.40	8.0	10.4
9.0	11.70	9.0	11.70	9.0	11.70	9.0	11.70	9.0	11.7
10.0	13.0	10.0	13.0	10.0	13.0	10.0	13.0	10.0	13.0
20.0	26.0	20.0	26.0	20.0	26.0	20.0	26.0	20.0	26.0
30.0	39.0	30.0	39.0	30.0	39.0	30.0	39.0	30.0	39.0
40.0	52.0	40.0	52.0	40.0	52.0	40.0	52.0	40.0	53.0
		50.0	65.0	50.0	65.0	50.0	65.0	50.0	65.0
		60.0	78.0	60.0	78.0	60.0	78.0	60.0	78.0
		70.0	91.0	70.0	91.0	70.0	91.0	70.0	91.0
		80.0	104.0	80.0	104.0	80.0	104.0	80.0	104.0
		90.0	117.0	90.0	117.0	90.0	117.0	90.0	117.0
				100.0	130.0	100.0	130.0	100.0	130.0
						200.0	260.0	200.0	260.0
						300.0	390.0	300.0	390.0
						400.0	520.0	400.0	520.0
								500.0	650.0
								600.0	780.0
								700.0	910.0
								800.0	1040.0
								900.0	1170.0
								1000.0	1300.0
								2000.0	2600.0

Earth bond resistance maximum display values

Limit Value	Maximum Display Value
0.4	0.28
0.5	0.35
0.6	0.42
0.7	0.49
0.8	0.56
0.9	0.63
1.0	0.7
2.0	1.4
3.0	2.1
4.0	2.8
5.0	3.5
6.0	4.2
7.0	4.9
8.0	5.6
9.0	6.3
10.0	7.0
20.0	14.0
30.0	21.0
40.0	28.0
50.0	35.0
60.0	42.0
70.0	49.0
80.0	56.0
90.0	63.0

Limit Value	Maximum Display Value
100.0	70.0
200.0	140.0
300.0	210.0
400.0	280.0
500.0	350.0
600.0	420.0
700.0	490.0
800.0	560.0
900.0	630.0
1000.0	700.0
2000.0	1400.0

1507/1503 General Specifications

Maximum voltage applied to any terminal: 600 V ac rms or dc
Storage temperature: -40 °C to 60 °C (-40 °F to 140 °F)
Operating temperature: -20 °C to 55 °C (-4 °F to 131 °F)
Temperature coefficient: 0.05 x (specified accuracy) per °C for temperatures < 18 °C or > 28 °C (< 64 °F or > 82 °F)
Relative humidity noncondensing:
0 % to 95 % @ 10 °C to 30 °C (50 °F to 86 °F)
0 % to 75 % @ 30 °C to 40 °C (86 °F to 104 °F)
0 % to 40 % @ 40 °C to 55 °C (104 °F to 131 °F)
Vibration: Random, 2 g, 5-500 Hz per MIL-PRF-28800F, Class 2 instrument
Shock: 1 meter drop per IEC 61010-1 2nd Edition (1 meter drop test, six sides, oak floor)
Electromagnetic compatibility: In an RF field of 3 V/M, accuracy = specified accuracy (EN 61326-1:1997)
Safety: Complies with ANSI/ISA 82.02.01 (61010-1) 2004, CAN/CSA-C22.2 NO. 61010-1-04, and IEC/EN 61010-1 2nd Edition for measurement category IV 600 V (CAT IV)
Certifications: CSA per standard CSA/CAN C22.2 No. 61010.1-04; TUV per standard IEC/EN 61010-1 2nd Edition
Batteries: Four AA batteries (NEDA 15A or IEC LR6)
Battery life
Insulation test use: Tester can perform at least 1000 insulation tests with fresh alkaline batteries at room temperature. These are standard tests of 1000 V into 1 MΩ with a duty cycle of 5 seconds on and 25 seconds off.
Resistance measurements: Tester can perform at least 2500 earth bond resistance measurements with fresh alkaline batteries at room temperature. These are standard tests of 1 Ω with a duty cycle of 5 seconds on and 25 seconds off.
Size: 5.0 cm H x 10.0 cm W x 20.3 cm L (1.97 in H x 3.94 in W x 8.00 in L)
Weight: 550 g (1.2 lb)
IP rating: IP40
Altitude
Operating: 2000 m CAT IV 600 V, 3000 m CAT III 600 V
Non-operating (storage): 12,000 m
Over-range capability: 110 % of range
Included accessories: TL224 Test Leads, TP74 Test Probes, clips PN 1958654 (red) and PN 1958646 (black), holster and remote probe

Ordering Information

Fluke-1507 Insulation Tester
Fluke-1503 Insulation Tester

Included
Remote probe, test leads, test probes, alligator clips, holster, user documentation

Optional accessories

TPAK™ Magnetic Tool Hanger
C101 Hard Case
TLK225 SureGrip Master Accessory Kit

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FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А