FLUKE®

Test Tools Catalog

Volume one, 2007

Fluke Ti20
Thermal Imager

Fluke 975
AirMeter™

Fluke 1587
Insulation Multimeter

Fluke 199C
Color ScopeMeter®

Test Tools Catalog Volume 37, 2007

FLUKE®

Contents

Fluke tools for:
Commercial Electricians 3
Industrial Electricians 4
HVAC/IAQ Technicians 5
Online resource centers 6
Fluke test tool information 7
Safety and its importance 8
Service, repair, and calibration 9

Digital Multimeters
Multimeter Selection Guide 10
Faster, Safer Multimeters 11
189 Logging Multimeter 12
FlukeView Forms® Software 13
87V Industrial Multimeter 14
179 Digital Multimeter 15
Family of True-rms Digital Multimeters 16
117 and 115 True-rms Digital Multimeters 17
116 and 114 True-rms Digital Multimeters 18
77-IV and 73-III Digital Multimeters 19
27 Waterproof Multimeter 19
88V Automotive Multimeter 20
8845A/8846A 6.5 Digit Precision Multimeters 21

Electrical Testers
T3 and T5 Electrical Testers, VoltAlert™ 22
9040 Rotary Field Indicator 22

Earth Ground Testers
1625 and 1623 Geo Earth Ground Testers 23
1630 Earth Ground Clamp Meter, Handy Geo Earth Ground Tester 24

Power Quality Analyzers
430 Series Power Quality Analyzers 25
43B Power Quality Analyzer 26
1760 Power Quality Recorder, 1650 RPM Power Recorder 27
1740 Series Three-Phase PQ Loggers, VR101S Voltage Event Recorder System 28
1735 Three-Phase Power Logger, Norma 4/5000 Power Analyzers 29

Clamp Meters
Fluke 345 and LH1050, LH1060 Power Clamp Meters 30
Fluke 360 and LH41 Current Clamp Meters, LH2015 True-rms Clamp Meter 31
Better Clamp Meters from Fluke 32
330 and 320 Series Clamp Meters 33
902 True-rms HVAC Clamp Meter 54

Insulation Testers and MegOhmMeters
1550B and 1520 Megohmmeters 34
1587 and 1577 Insulation Multimeters 35
1507 and 1503 Insulation Testers 36

Process Calibration Tools
Process Tools Selection Guide 37
744, 743B, 741B Documenting Process Calibrators 38
726, 725 Precision Multifunction Process Calibrators 39
724, 714, 712 Temperature Calibrators 40
718, 717 Pressure Calibrator, 700 Series Pressure Modules 41
715, 707, 705 Loop Calibrators 42
789, 787 Process Meters 43
771 Milliamp Process Clamp Meter 44
9102S, 9100S Handheld Drywell Temperature Calibrators 44

Intrinsically Safe Products
707Ex, 718Ex, 725Ex, 700PEx, 574-NI, 68IS, 87V Ex 45

Thermal Imagers
Ti40/Ti50 Series IR FlexCam® Thermal Imagers 46-47
Ti20 Thermal Imager 48
Ti30™ Thermal Imager 49
TiR4, TiR3, TiR2 IR FlexCam™ Thermal Imagers and IR InSight XS, XST Thermal Imagers 50

Thermometers
570 Series Infrared Thermometers 51
54 Series II Contact Thermometers 52
561 HVACPro Thermometer 52
60 Series Infrared Thermometers 53

HVAC/Indoor Air Quality Tools
975 AirMeter,™ 902 True-rms HVAC Clamp Meter 54
971 Temperature Humidity Meter, 983 Particle Counter 55

ScopeMeter® Test Tools
ScopeMeter Test Tools Selection Guide 56
124 Industrial ScopeMeter Test Tools 57
190 Series Color ScopeMeter Test Tools 58
Fluke ScopeMeter Accessories 59

Accessories
Accessory Selection Guide 60
Accessory Sets and Kits 61
SureGrip™ Accessories 62
Accessories for Electronic and Automotive Applications and High Voltage Probes 63
Lights, Software and Specialty Accessories 64-65
Current Clamps 66-67
Temperature Accessories 68-69
Cases, Holsters and Fuses 70-71

What's new from Fluke ..... back cover

Contact us:

United States
General product and sales information: 1-888-44-FLUKE
Fluke Thermal Imagers: 1-800-760-4620 (U.S. only) all other regions 1-425-446-4620
Service and calibration: 1-800-993-5853
Parts: 1-800-526-4731

Canada
General product and sales information: 1-800-36-FLUKE
Service, parts and calibration: 1-800-36-FLUKE
canada@fluke.com

Australia
General product and sales information: (2) 8850-3333
Parts: (2) 8850-3333
Service and calibration: (2) 9771-9300

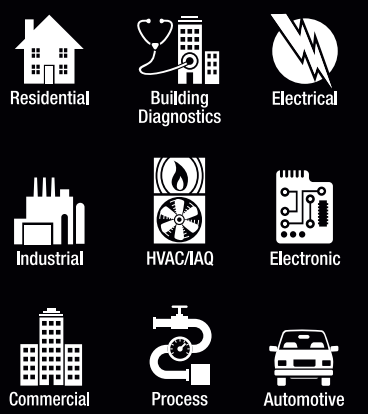
Singapore
General product and sales information: 6738-5655
info.asean@fluke.com
Service, parts and calibration: 6737-2922
service.asean@fluke.com

Japan
General product and sales information: +81-3-3434-0180
Service, parts and calibration: +81-3-3434-0188

Other countries: 1+(425) 446-5500

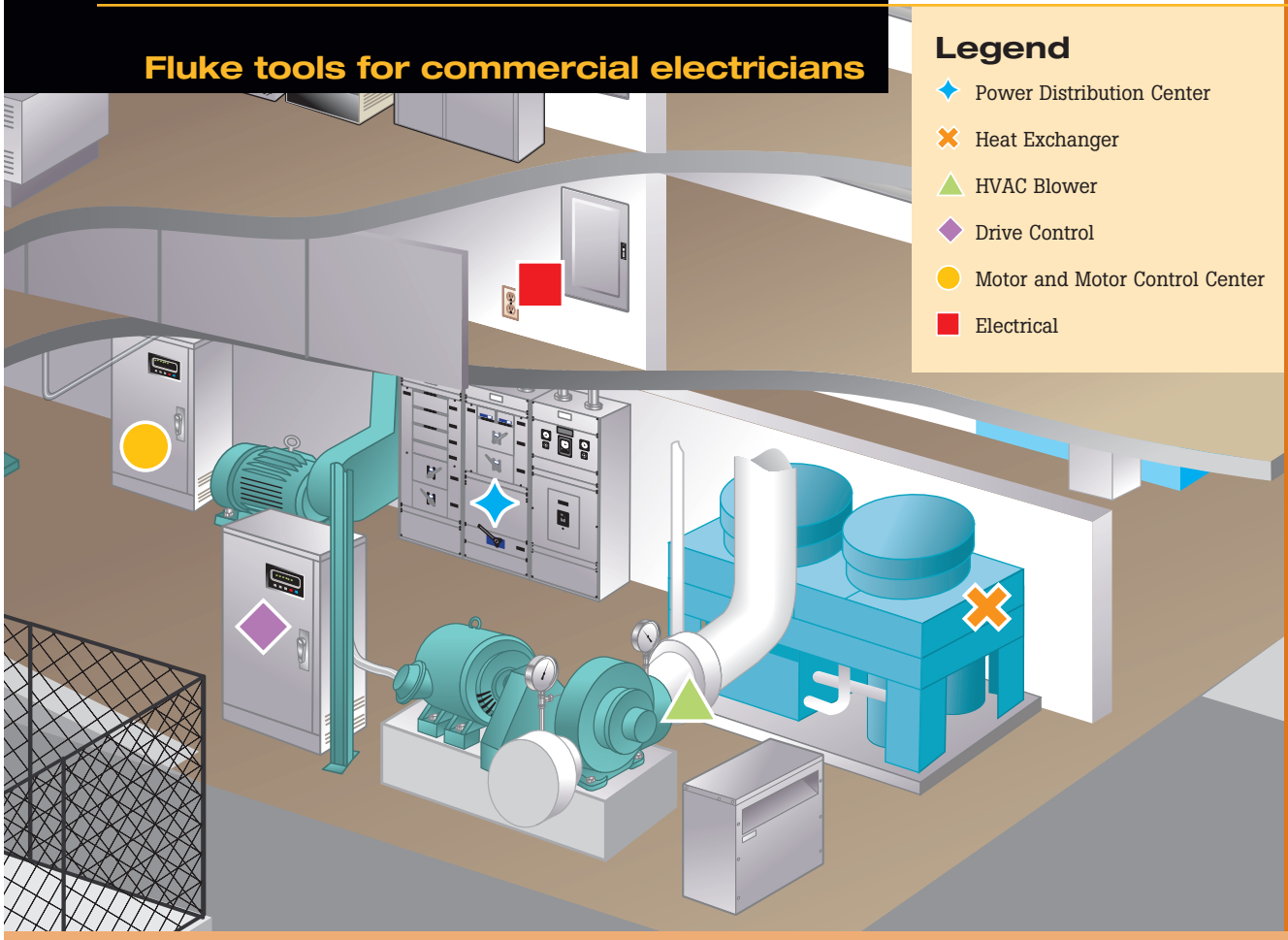
Application segment key

To help you better identify the right product for your job, you will find the applicable icons located on the outside edge of each product page.



Fluke test tools to help you get the job done

Fluke tools for commercial electricians



Legend

- Power Distribution Center
- Heat Exchanger
- HVAC Blower
- Drive Control
- Motor and Motor Control Center
- Electrical

Fluke 1AC II VoltAlert Voltage Detector

Best suited for:
- Non-contact voltage detection on electrical circuits
- Detecting voltage before work begins

See page 22 for details

Fluke 116 Digital Multimeter

Best suited for:
- Measures volts, ohms, capacitance and temperature
- Resistance and continuity
- 600 V ac and dc measurement range

See page 18 for details

Fluke 62 Mini IR Thermometer

Best suited for:
- Surface temperature readings
- Finding heating and ventilation problems
- Non-contact monitoring of electrical motors and panels

See page 53 for details

Fluke T5 Voltage, Continuity and Current Tester

Best suited for:
- Measure loads on a branch circuit at a service level
- Measure the load side voltage of a circuit breaker or fuse
- Map outlets to breakers
- Check individual voltages (either ac or dc)
- Determine resistances up to 1000 ohms
- Check circuit continuity

See page 22 for details

Fluke 322 Clamp Meter

Best suited for:
- Verify the presence of load current, ac/dc voltage and continuity
- Current measurements up to 400 A in tight cable compartments
- Higher resolution for loads below 40 A

See page 33 for details

Fluke 87V Industrial True-rms Multimeter w/temp

Best suited for:
- VSD motor drive installation and troubleshooting
- Accurate frequency and voltage measurements on motor drives and in electrically noisy environments
- Built-in thermometer for temperature measurements
- CAT III 1000 V rated to protect against high voltage transients up to 8 kV

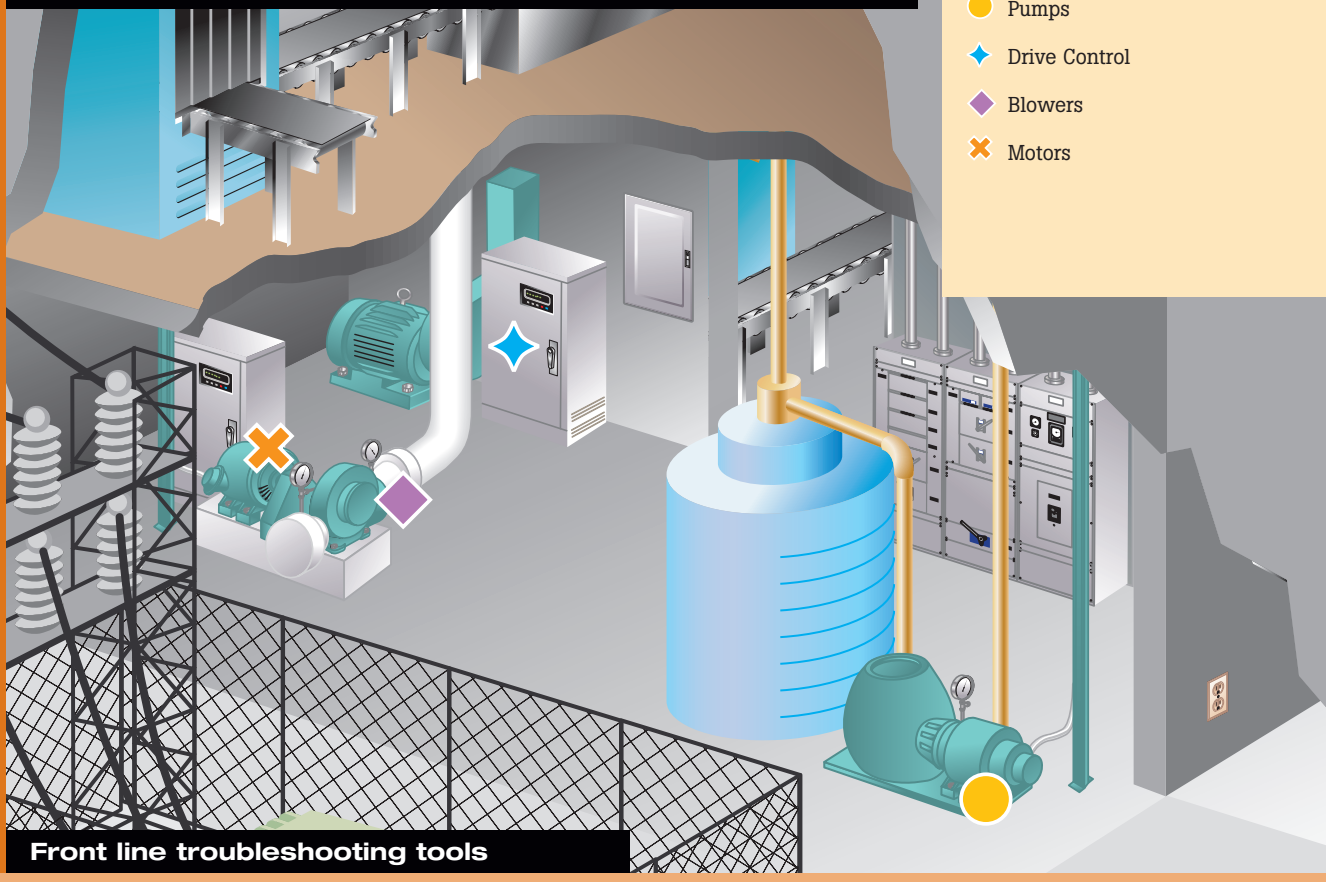
See page 14 for details

Fluke test tools to help you get the job done

Fluke tools for industrial electricians

Legend

- Pumps
- Drive Control
- Blowers
- Motors



Front line troubleshooting tools

Fluke 87V Industrial True-rms Multimeter w/temp

Best suited for: VSD motor drive installation and troubleshooting.

Features:
- Accurate frequency and voltage measurements on motor drives and in electrically noisy environments
- Built-in thermometer for temperature measurements

See page 13 for details

Fluke 1587 Insulation Multimeters

Best suited for: Work on motors, generators, cables or switch-gear.

Features:
- Measuring insulation test voltages to 1000 V
- Prevents insulation test if voltage > 30 V is detected for added user protection
- Filter for motor drive measurements

See page 35 for details

Fluke 337 AC/DC True-rms Clamp Meter

Best suited for: Measure inrush current on electric motor startup and electric motor testing and troubleshooting

Features:
- Inrush current measurements to measure start up current on electric motors
- Frequency measurements to help track down power quality problems

See page 33 for details

Preventive and predictive maintenance

Fluke 434 Three-Phase PQ Analyzer

Best suited for: Trouble-shooting and preventing problems in power distri-bution systems.

Features:
- Simultaneously measure voltage and current on all three phases and neutral
- High-resolution color screen simplifies operation
- Tough enough for industrial environments, easy to carry, works for seven hours per battery charge

See page 25 for details

Fluke 576 Photographic IR Thermometer

Best suited for: Measuring surface temperatures, quickly locating lubrication problems, overloads, short-circuits or misaligned and overheated equipment.

Features:
- Last ten temperature readings displayed on bar graph for easy reference
- Customizable log names, alarms and emissivity values for more efficient, less error-prone predictive maintenance routes

See page 51 for details

Fluke Ti20 Thermal Imager

Best suited for: Displaying a visual image of surface temperatures to easily and safely identify potential problems.

For use on:
- Electrical power distribu-tion systems
- Electro-mechanical equipment
- Process instrumentation
- Facility maintenance

See page 48 for details

Fluke test tools to help you get the job done

Fluke tools for HVAC/IAQ technicians

Legend

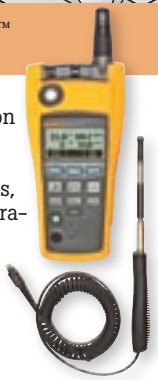
- Indoor Air Comfort
- Superheat and Subcooling
- Electrical
- Motors/Pumps/Compressors
- Building Diagnostics
- Filtration and Ventilation
- Furnace

Fluke 975 AirMeter™

Best suited for:
Optimizing HVAC ventilation settings for ASHRAE 62 recommendations

- Simultaneously measures, logs and displays temperature, humidity, velocity, CO_2 and CO

See page 54 for details



Fluke 983 Particle Counter

Best suited for:
Troubleshooting and maintaining indoor air quality

- Measures particle size, temperature, and relative humidity
- Data logging and six-channel particle size display

See page 55 for details

Fluke 116 Digital Multimeter

Best suited for:
Troubleshooting HVAC equipment and flame sensors

- Thermometer and microamps
- Volts ac/dc, resistance, diode, continuity, and Min/Max/Avg

See page 18 for details

Fluke 902 True-rms HVAC Clamp Meter

Best suited for: HVAC system diagnosis and repair

- Capacitance and true-rms
- DC current to 200 µA
- Contact temperature

See page 54 for details

Fluke 561 HVACPro IR Thermometer

Best suited for: Measuring hot, moving, electrical energized objects

- Contact and non-contact measurement
- Compatible with standard type-K thermocouple
- Includes Velcro® pipe probe

See page 52 for details

Fluke IR Insight XS/XST Thermal Imagers

Best suited for:
Quick, accurate building diagnostic surveys

- High resolution images and display
- Industry -leading thermal sensitivity
- Simple, one-button operation

See page 50 for details

Online resource centers

Test tool applications

Electrical Resource Center
www.fluke.com/electrical_resource_ctr
Product demos, software downloads, earth ground education, application notes, training and events information.

HVAC/IAQ Resource Center
www.fluke.com/IAQ
FAQs, white papers, case studies and application notes, downloads, and product demos.

Plant Maintenance Resource Center
www.fluke.com/plant_resource_ctr
ROI calculator, PDM program, maintenance techniques, tool profiles, common culprits.

Thermal Imaging Resource Center
www.fluke.com/thermal_resource
Online product selection guide, product information, application notes, software

Biomedical Resource Center
www.fluke.com/biomed_resource_ctr
Product news and information, catalog, trade-up program, and tradeshow schedule.

Electronics Resource Center
www.fluke.com/electronics_resource_ctr
Tips from the field, product demos, application notes, and product showcase.

Intrinsic Safety Resource Center
www.fluke.com/ex
Standards explanations, industry applications, guidelines, and product information.

Building Diagnostics Resource Center
www.fluke.com/buildings
Image gallery, application notes, and expert tips on using thermography to identify structural, thermal, moisture, and air leakage problems in buildings.

Precision Measurement and Calibration Resource Center
www.fluke.com/precision_resource_ctr
New product information, e-news bulletins, total solutions newsletter, industry links, users community, used certified equipment, technical papers and application notes.

Process Control Resource Center
www.fluke.com/process_resource_ctr
Process calibration glossary, industry information, ROI calculator, application notes, and product demos.

Utilities Resource Center
www.fluke.com/utilities_resource_ctr
Training and events information, product demos, specialized technical support, application notes, and power quality, thermography and earth ground information for utilities.

Solve more problems with Fluke Tools

Fluke is more than digital multimeters. These days, Fluke offers the ultimate go-everywhere DMM as well as specialized tools for electrical, industrial, HVAC, and electronic applications.

Increasingly, technicians are using their Fluke tools together, in a one-two troubleshooting combination.

Use a thermal imager to find a problem, then use a DMM, clamp meter, or power quality analyzer to fix it.

Use a power logger to check power usage, use an AirMeter to optimize the HVAC system, and then log power again to see the impact of your adjustments.

The online resource centers on this page can help you find the right tools for your applications, learn how to use them, and get to work.

Your site-specific knowledge plus Fluke tools makes for an impressive troubleshooting team.

Plus, the new generation of Fluke tools is smaller, lighter, and easier to use than ever. They meet higher safety standards. They download to reports. And they're as reliable and tough as ever.

By offering a system of tools that work together, Fluke aims to help you solve more problems, faster and better, no matter where you work.

Fluke... more than just tools

Test tool information

Since 1949 the Fluke Corporation has been dedicated to the design and manufacturing of innovative test and measurement instruments. Fluke also leads the way in providing programs, training and resources that help you stay at the forefront of your profession.

FlukePlus Tool Info Online
www.fluke.com/flukeplus

FlukePlus is a website for test tool users who want to learn more. Sign up and get:
- Product tips and "how to" articles
- Previews of the newest Fluke tools
- Special offers and promotions
- Direct connection to Fluke technical support

Fluke Education Partnership Program
www.fluke.com/education

We've teamed up with colleges, trade, technical, vocational schools, and apprenticeship programs to bring the latest application information and tools into the classroom. Currently available in USA, Canada, Brunei, Burma, India, Indonesia, Laos, Malaysia, Philippines, Singapore, Taiwan, Thailand and Vietnam.

Electrical Measurement Safety Program
www.fluke.com/safety

Get a free safety video, a summary of safety standards and helpful articles on safe electrical measurement practices. (Available only in the U.S.)

Test Tool Users Online Community
www.fluke.com/community

See what other test tool users are saying and get your questions answered, fast! The Test Tool Community online bulletin board is free and open to everyone.

Application Notes
www.fluke.com/appnotes

Fluke has a complete library of application notes and white papers on topics ranging from predictive maintenance to maintaining motors and drives to automotive troubleshooting and more.

Fluke News
www.fluke.com/flukenews

Fluke News is published two times a year with new tips, tools and articles in each issue.

Fluke Electrical News
For electrical contractors or electricians working in residential, commercial, or industrial environments.

Fluke Plant News
For electricians, electrical supervisors, field service technicians, plant technicians and process engineers maintaining industrial equipment in the field or plant.

Fluke Electronics News
For electronics or electrical engineers who use DMMs, benchtop meters, and oscilloscopes in prototyping, design and field evaluation situations.

Fluke HVAC/IAQ News
All-new articles about tools, measuring practices, and business opportunities for HVAC and Indoor Air Quality (IAQ) professionals.

FLUKE ®

Safety and You

Why is safety important? Why should you care?

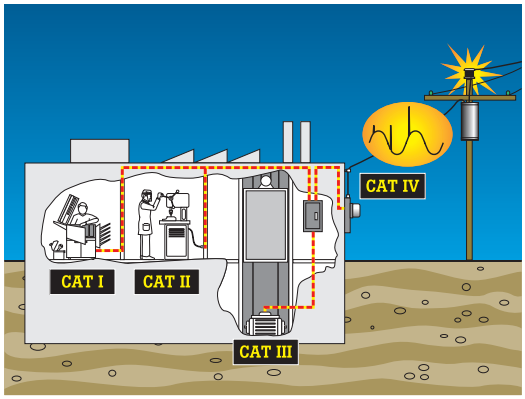
Between five and ten times on any given day, arc flash explosions, sufficient to send a victim to a special burn center, take place in the U.S. These incidents and other less serious electrical accidents result in injury —sometimes death—lost work time, medical costs and insurance claims, downtime, the list goes on.

The cost to both the victim, the victim's family and the company involved, are high. Yet many of these accidents can be prevented. The combination of training, good measurement technique, and the use of proper tools can significantly reduce the chance of an accident occurring.

Go to **www.fluke.com/safety** to view The Fluke Electrical Measurement Safety Program and order your free copy of the Fluke Safety video. This video makes the standards easy to understand and can be used as part of your own internal safety program.

What are the Standards?
To provide improved protection for users, industry standards organizations have taken steps to clarify the hazards present in electrical supply environments. The American National Standards Institute (ANSI), the Canadian Standards Association (CSA), and the International Electro-Technical Commission (IEC), have created more stringent standards for voltage test equipment used in environments of up to 1000 volts.

ANSI, CSA and IEC define four measurement categories of over-voltage transient impulses. The rule of thumb is that the closer the technician is working to the power source, the greater the danger and the higher the measurement category number. Lower category installations usually have greater impedance, which dampens transients and helps limit the fault current that can feed an arc.



- CAT (Category) IV is associated with the origin of installation. This refers to power lines at the utility connection, but also includes any overhead and underground outside cable runs, since both may be affected by lightning.
- CAT III covers distribution level wiring. This includes 480-volt and 600-volt circuits such as 3-phase bus and feeder circuits, motor control centers, load centers and distribution panels. Permanently installed loads are also classed as CAT III. CAT III includes large loads that can generate their own transients. At this level, the trend to using higher voltage levels in modern buildings has changed the picture and increased the potential hazards.
- CAT II covers the receptacle circuit level and plug-in loads.
- CAT I refers to protected electronic circuits.

Some installed equipment may include multiple categories. A motor drive panel, for example, may be CAT III on the 480-volt power side, and CAT I on the control side.

Independent testing labs help ensure safety compliance
You want your tools and equipment to help you work safely. But how do you know that a tool designed to meet a safety standard will actually deliver the performance you are paying for?

Unfortunately it's not enough to just look on the box. The IEC (International Electrotechnical Commission) develops and proposes standards, but it is not responsible for enforcing the standards. Wording like "Designed to meet specification..." may not mean a test tool actually performs up to spec. Designer's plans are never a substitute for an actual independent test.

Underwriters Laboratories (UL)

Canadian Standards Association (CSA)

TUV and VDE (German standards organizations) are approval/listing agencies

United States Department of Labor Mine Safety and Health Administration

That's why independent testing is so important. To be confident, check the product for the symbol and listing number of Underwriters Laboratories (UL), the Canadian Standards Association (CSA), TÜV or another recognized testing organization. Those symbols can only be used if the product successfully completed testing to the agency's standard, which is based on national/international standards. That is the closest you can come to ensuring that the test tool you choose was actually tested for safety.

What does the CE symbol indicate?
A product is marked CE (Conformité Européenne) to show it conforms to health, safety, environment and consumer protection requirements established by the European Commission. Products from outside the European Union cannot be sold there unless they comply with applicable directives. But manufacturers are permitted to self-certify that they have met the standards, issue their own Declaration of Conformity, and mark the product "CE." The CE mark is not, therefore, a guarantee of independent testing.

Why are Fluke products different?
Don't be confused by "Listed" vs. "Designed to" in your test tools. IEC sets the standards but does not test or inspect for compliance. So a manufacturer can claim to "design to" a standard with no independent verification. To be UL-Listed, CSA or TUV-Certified, a manufacturer must employ the listing agency to TEST the product's compliance with the standard. Look for the listing agency's emblem on the meter.

For more information, go to www.fluke.com/safety

Service Information

Think of Fluke first for technical service, repair and calibration

Fluke customer support is ready to help

Calibrating a thermometer.

Technical service at your fingertips
We know Fluke tool users put their tools through the paces, so we're ready to answer your questions and help keep your tools in top shape. No matter what application, in what industry. And we'll do it through real technical service professionals in Everett, Washington.

When you need questions answered, call Sales and Application Support at 1-888-44-Fluke or email fluke-info@fluke.com
The Fluke experts answering your call can help with just about any test tool question. They specialize in:

- Advice on what to buy, from problem analysis to tool compatibility and configuration
  "If I'm working with three phase motors, what's the best tool to use?"
- Help on how to use your tools in any application, from automotive to industrial
  "How come I'm not getting a reading?"
  "How do I transfer my test results?" "How do I measure harmonics?"

When your Fluke tools need repair or calibration, call Customer Support Services at 1-888-99-Fluke or email service.status@fluke.com. Customers outside the U.S. email service.international@fluke.com or visit www.fluke.com/service to find your nearest location.
If your tool isn't working correctly, or if you dropped it, ran over it, or dunked it in the pool, call Fluke. If it's not under warranty, we'll give you a cost estimate over the phone. Once you send it in, we'll verify the problem, fix it, test it and put it back in the mail often in less than five working days.

Fluke recommends having your DMMs, Calibrators and ScopeMeter test tools calibrated once a year—especially if you use them often or need accurate measurements to meet regulations requirements. Calibration compares your tool's measurements to the accuracy standard—sort of like setting your watch to match an atomic clock. Some test tools live a pretty rough life. If you calibrate them, you know they're accurate—even after what you put them through.

For more information on servicing your Fluke tools outside of the U.S., see page 2 for contact information.

Application note, literature code 2153519:

Why calibrate test equipment?

Why would a digital test tool need to be calibrated? It's not as though any analog parts will go out of balance. Well, have any events occurred that would render your instruments less accurate or unsafe? Is accurate measurement essential to your operations? Are you trending data? Read this application note to find out what causes calibration problems and whether you should consider calibrating your test instruments.

Visit **www.fluke.com/why-calibrate**

Application note, literature code 2138394:

Shocking treatment

Because of our commitment to safety, all Fluke equipment is designed to provide as much protection as possible from the inherent dangers of working in the unsettled sea of electricity. Fluke products are dropped, shocked, short circuited, injected with thousands of volts of electricity and forced to endure extreme temperature, just to get out the door.

To learn more about our product tests, visit **www.fluke.com/shocking**

Pick the right digital multimeter for you

Digital Multimeter Selection Guide

Models	Highest accuracy with data logging 189	Industrial troubleshooting 87V	True-rms and built-in thermometer 179	Designed for building maintenance 117	Designed for HVAC/R technicians 116	Waterproof and chemical resistant 27	Two powerful tools in one 1587	4-20 mA loop diagnostics 789
Basic features								
True-rms readings	AC+DC	AC	AC	AC	AC		AC	AC
Basic dc accuracy	0.025 %	0.05 %	0.09 %	0.5 %	0.5 %	0.1 %	0.09 %	0.1 %
Wide bandwidth	100 kHz	20 kHz				30 kHz		
Auto/manual ranging	•	•	•	•	•	•	•	•
Digits	4-1/2	4-1/2	3-1/2	3-1/2	3-1/2	3-1/2		3-1/2
Counts	50000	20000	6000	6000	6000	3200	6000	4000
Measurements								
Voltage ac/dc	1000 V	1000 V	1000 V	600 V	600 V	1000 V	1000 V	1000 V
Current ac/dc	10 A	10 A	10 A	10 A	600 µA	10 A	400 mA	1 A
Resistance	500 MΩ	50 MΩ	50 MΩ	40 MΩ	40 MΩ	32 MΩ	50 MΩ	40 MΩ
Frequency	1 MHz	200 kHz	100 kHz	50 kHz	50 kHz		100 kHz	20 kHz
Capacitance	50 mF	10 mF	10 mF	10 mF	10 mF		10 mF	
Temperature	+1350 °C	+1090 °C	+400 °C		+400 °C		+500 °C	
dB	60 dB							
Conductance	50 nS	50 nS				32 nS		
Duty cycle/pulse width	•	•						
Motor drive measurements/low pass filter		•					•	
Continuity with beeper	•	•	•	•	•	•	•	•
Diode test	•	•	•	•	•	•	•	•
Display								
Dual display	•							•
Analog bargraph	•	•	•	•	•	•		•
Backlight	•	•	•	•	•		•	•
Data storage and exchange								
Min/Max recording		•	•	•	•	•	•	•
Min/Max recording/with time stamp	•						•	
Fast Min/Max	250 µs	250 µs						
Display Hold/Auto (Touch) Hold	•	•	•	•	•	•		•
Relative reference	•	•				•		•
PC interface	•							•
Data logging	•							with PC
Readings memories	100							
Other features								
Automatic selection, LoZ				•				
Insulation test range							0.01 MΩ to 2 GΩ	
VoltAlert, non-contact ac voltage detector)				•				
Real time clock	•							
Overmolded case, integrated holster	•		•					•
Removable holster		•		•	•		•	
ToolPak Magnetic Hangar compatibility	•	•	•	•	•			•
Closed case calibration	•	•	•	•	•		•	•
Separate battery door	•	•	•	•	•	•	•	•
Completely sealed/watertight						•		
Automatic power off	•	•	•	•	•		•	•
Low battery indication	•	•	•	•	•	•	•	•
Operating temperature range	–20 °C, +55 °C	–20 °C, +55 °C	–10 °C, +50 °C	–10 °C, +50 °C	–10 °C, +50 °C	–40 °C, +55 °C		–20 °C, +55 °C
4-20 mA								•
24 V loop supply								•
Warranty and electrical safety								
Limited lifetime warranty	•	•	•			•		
Warranty (years)				3	3		3	3
Input alert	•	•						
Dangerous voltage indication	•	•	•	•	•		•	•
CAT III measurements	1000 V	1000 V	1000 V	600 V	600 V	1000 V	1000 V	1000 V
CAT IV measurements	600 V	600 V	600 V			600 V	600 V	
See page	**12**	**14**	**15**	**17**	**18**	**19**	**35**	**43**

More comprehensive information is available at www.fluke.com/dmm

Test faster and safer with a new Fluke

Move up to more measurement performance and safety

Move up from your old 87 and benefit from more than a dozen improvements

Function	Original 87	87V	Benefit
Selectable filter for motor drives	No	**Yes**	Accurate voltage and frequency measurements on pulse width modulated signals
Built-in thermometer	No	**Yes**	No separate thermometer required
Capacitance	5 nf to 5 µF	**5 nf to 10,000 µF**	Measure more capacitors
V dc accuracy and resolution	0.1 %, 10 µV	**0.05 %, 10 µV**	Precise measurements in a handheld tool
Display digits	13.5 mm x 7 mm	**15.25 mm x 8.5 mm**	30 % larger makes it easy to read
Backlight	Green	**2-level, bright white**	Easier to read in dark locations
Magnetic hanger	No	**Optional (included with kit)**	Position meter for easy viewing
Peak capture	1 ms	**250 µS**	Record intermittent problems four times faster
CAT electrical safety rating	No	**Yes, 2nd edition ANSI and IEC 61010**	Increased protection from 8 kV spikes that can cause arc flash
Battery door	No	**Yes**	Change battery quickly without breaking cal seal
Warranty	Expired	**Limited lifetime**	Lower cost of ownership

87 87V

Get accurate voltage and frequency measurements on adjustable speed motor drives with the 87V.

Move up from your old 8060 or 8062 and benefit from more than 20 improvements

Function	8060	189	Benefit
Built-in recorder with time stamp	No	**Yes**	Record and view intermittent problems without a chart recorder
PC interface	No	**Yes, software optional**	Transfer readings to a PC for analysis and documentation
Built-in thermometer	No	**Yes, probe optional**	No need to carry a separate thermometer
Capacitance	No	**5 nf to 50,000 µF**	Measure capacitors with one tool
V dc and V ac resolution	10 µV	**1 µV**	Precise measurements in a handheld tool
dBv and dBm	Yes	**Yes**	Measure communication circuits
Duty cycle and pulse width	No	**Yes**	Measure control circuits
In-line current	2 A	**10 A, 1000 V fuse**	Safely measure five times more current
Relative offset	No	**Yes**	Remove test lead resistance See small signal variations
Range selection	Manual, 8 switches	**Auto/Manual range**	Simpler to use, more durable
Peak capture, MIN/MAX	No	**250 µS**	Record intermittent problems
Backlight	No	**2-level, bright white**	Easier to read in dark locations
Holster	No	**Integrated overmold**	Stands up to accidental drops
Magnetic hanger	No	**optional TPAK**	Position meter for easy viewing
CAT electrical safety rating	No	**Yes, 2nd edition ANSI and IEC**	Increased protection from 8 kV spikes that can cause arc flash
Battery door	No	**Yes**	Change battery quickly without breaking cal seal
Warranty	Expired	**Limited lifetime**	Lower cost of ownership

8060 189

Use the built-in data logging feature of the 189 to record readings and the time they occurred to catch intermittent problems.

Move up from your old 70 or 20 series and benefit from more than 15 improvements

Feature	Original 77	179	Benefit
True-rms	No	**Yes**	Accurate on non-linear signals
Accuracy, basic dc	0.3 %	**0.09 %**	Three times more accurate
Temperature	No	**Yes**	No need for a separate thermometer
Min/Max/Average	No	**Yes**	Capture intermittent problems
Display size	Small	**20 % larger**	Large, easy to read
Display backlight	No	**Yes**	Easy to read in dark locations
Simple to use	Yes	**Yes**	No retraining required
Probe holders	Yes	**Improved**	One-hand operation
Latest electrical measurement safety standards	Not rated	**1000 V CAT III, 600 V CAT IV**	Designed to withstand 8,000 volt peak transient impulses and protect against arc flash
Optional magnetic hanger	No	**Yes**	Position meter in best location
Warranty	Expired	**Limited lifetime**	Lower cost of ownership
Frequency	No	**Yes**	Built in frequency counter
Capacitance	No	**Yes**	Measure motor capacitors and components
Max. ac voltage	750	**1000**	Wider measurement range
Battery door	No	**Yes**	Change battery quickly without breaking cal seal

77 179

The ultimate multi-purpose meter, the 179 combines precision, safety and reliability to help you get any job done.

Fluke 189 Logging Multimeter

Solve complex problems for electronic and industrial applications

True-rms

The Fluke 189 is the most advanced meter with features, precision and accuracy to troubleshoot industrial and electronic equipment in the field or on the bench. The Fluke 189 has a **built-in data logger** to record measurements unattended. Recorded data can be viewed on the 189 or transferred to a PC with optional FlukeView® Forms software.

- Built in data logger (Fluke 189) records reading and time to catch intermittent problems
- True-rms, 100 KHz bandwidth for precise measurement of non linear signals
- 0.025 % dc accuracy and 1 microvolt resolution for bench meter performance in a handheld package
- Measure 20 A for up to 30 seconds, 10 A continuous
- Temperature, capacitance, dB, frequency, pulse width and duty cycle to find more problems with one tool
- Large bright white display with dual parameter readout to view multiple readings at once
- Min/Max with timestamp to record signal fluctuations
- Peak capture to measure transients as short as 250 µS
- Isolated IR communication port to send data to a PC (with optional FVF pack)
- Premium test leads and alligator clips (AC72) included
- **New!** Optional USB data cable with FlukeView Forms
- **New!** Optional battery pack (BP189) extends battery life to over 400 hours

Electrical safety

All inputs are protected to measurement CAT III 1000 V and CAT IV 600 V.

Available in non-logging version as Fluke 187

Specifications – 189 and 187 DMMs

Function	Range and resolution	Best accuracy 180 Series
V dc	50.000 mV, 500.00 mV, 3000.0 mV, 5.0000 V, 50.000 V, 500.00 V, 1000.0 V	± 0.025 %
V ac	50.000 mV, 500.00 mV, 3000.0 mV, 5.0000 V, 50.000 V, 500.00 V, 1000.0 V	± 0.4 %
A dc	500.00 µA, 5,000 µA, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A*	± 0.15 %
A ac	500.00 µA, 5,000 µA, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A*	± 0.75 %
Resistance	500.00 Ω to 500.0 MΩ	± 0.05 %
Capacitance	1.000 nF to 50.00 mF	± 1.00 %
Frequency	500.00 Hz, 5.0000 kHz, 50.000 kHz, 999.99 kHz	± 0.005 %
Temperature	–200 °C to 1350 °C (–328 °F to 2462 °F)	± 1 % of reading
Duty cycle	10 % to 90 %, resolution 0.01 %	–
Pulse width	2 ranges, 499.99 ms and 999.9 ms, best resolution 0.01 ms	3 %
dBm, dBv	–62 to +60, resolution 0.01dB	0.1 dB

*10 A continuous, 20 A for up to 30 seconds and not specified.

Battery life: 72 hours typical (alkaline), 450 hours typical with Battery Extender (BP189)
Size (LxWxD): 203 mm x 100 mm x 50 mm (8.00 in x 3.94 in x 1.97 in)
Weight: 0.545 kg (19.2 oz)

Recommended accessories – 189 and 187 DMMs

TL910
Electronic Test Probes
See page 63

TL81A
Test Lead Kit
See page 63

C125
Meter Case
See page 70

BP189
High Capacity Battery Pack
See page 65

FVF-SC2
FlukeView Forms Software
See page 65

For more information and detailed specifications, go to www.fluke.com/dmm

Log and document

Buy Combo Pack and Save

NEW! The 189/FVF2 Data Logging Multimeter and Software Combo Pack gives you a practical, affordable approach to predictive maintenance.

- With built-in data logger, the 189 helps you track down elusive, intermittent problems, monitoring equipment with any of its functions, while you do other jobs
- Overlay data from six meters or six time periods to find cause and effect relationships or for condition monitoring applications
- With break-through accuracy and precision, catch events as brief as 50 ms
- Designed for harsh environments that would ruin most data loggers or multimeters
- Log up to 450 hours of data using the extended battery pack
- Turn data into meaningful graphs and tables using FlukeView Forms software
- TPAK™ Magnetic Hanger allows you to securely hang your meter for monitoring or hands-free use
- Soft carrying case to protect your investment
- USB cable included with kit

Included accessories

Every 180 series meter comes packaged with TL71 Silicone Test Leads, probe holders, two AC72 Alligator Clips, four AA batteries (installed), CD-ROM (users manual and technical notes) and operator's guide.

Ordering information

Fluke-189/FVF2	Logging Multimeter and Software Combo Pack
Fluke-189	Logging Multimeter
Fluke-187	Digital Multimeter
FVF-SC2	FlukeView Forms Software w/cable

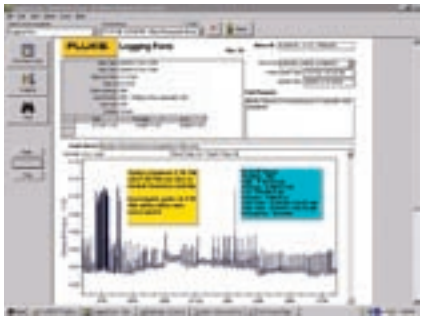
FlukeView® Forms Software

Utilize this powerful tool to analyze your measurements

Harness the power of the data logging function on your Fluke Digital Multimeter. FlukeView Forms offers an easy-to-use, customizable solution to help you document logged data. Easy-to-use wizards allow you to download readings from your Fluke tool and display individual readings or a series of measurements.

- Graph data to help you detect trends, analyze, predict and prevent problems
- Print, save and share logged data
- Log live readings while connected to a PC, or leave your Fluke 189 in place to capture up to 1,000 readings for download to a PC
- Display readings from up to six different meters on the same graph to show links between multiple processes, events and locations
- Record and display any function the meter measures: volts, ohms, frequency, capacitance, temperature, diode testing and more
- Free demo-reader download allows co-workers or clients to open your report and interact with captured data
- Export data into Microsoft® Excel

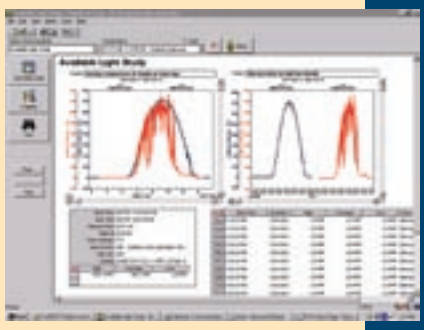
To take a test drive of the power of FlukeView Forms, download demonstration software for free at www.fluke.com/flukeviewforms



You can share reports and add notes to draw attention to and explain anomalies.

Customize reports using your specific data or company logo, spot trends and document interruptions or spikes.

A single graph overlaying two time periods makes analysis easier.



Use the FlukeView designer to turn simple time and event data into fully customized reports.

Fluke 189, 189/FVF2 Kit and 187 capabilities

	189/FVF2	189	187	Benefit
Fluke 180 Series Multimeter and premium test leads	•	•	•	Fluke's top-of-the-line multimeter with maximum feature set to troubleshoot any situation.
PC connectable	•	•	•	Use to download and document test results.
Logging capabilities	•	•		Reduce man-hours by using logging to find problems and intermittent glitches.
FlukeView Forms software	•			Document and print measurement data in a clear and organized format.
Overlay and graph data from up to six meters	•	•		Find elusive cause/effective relationships.
Compatible with FlukeView Forms Demo Reader	•	•	•	Allow data to be distributed and shared with individuals throughout a company for free.

For more information and detailed specifications, go to www.fluke.com/flukeviewforms

Compatible with

FVF-SC2	Fluke 187 and 189 Digital Multimeters, Fluke 1550B MegOhmMeter, Fluke 789 ProcessMeter™
FVF-SC1	Fluke 53-II and 54-II Thermometers
FVF-SC3	Fluke 45 Bench Meter

Fluke 87V Industrial Multimeter

Diagnostic functions for maximum industrial productivity

The Fluke 87V has measurement functions, trouble-shooting features, resolution and accuracy to solve more problems on motor drives, in-plant automation, power distribution and electro-mechanical equipment.

New features for maximum productivity

- Unique function for accurate voltage and frequency measurements on adjustable speed motor drives and electrically noisy equipment (87V and 87V Ex)
- Large digit display with bright two level backlight makes the 87V significantly easier to read
- Measure 20 A for up to 30 sec, 10 A continuously
- Optional magnetic hanger for easy setup and viewing while freeing your hands for other tasks (TPAK)
- Expanded capacitance range to 10,000 µF
- Built-in thermometer (87V)

Electrical safety

All inputs are protected to CAT III 1000 V and CAT IV 600 V. They can withstand impulses in excess of 8,000 V to help protect you from arc blast resulting from surges and spikes.

Available in intrinsically safe version as the Fluke 87V Ex.

N10140

Also available as 83V average responding multimeter, see below for specifications

Application note, literature code 2155830:

Multimeter measurements on adjustable speed drives utilizing the Fluke 87V DMM

How do I troubleshoot an adjustable speed drive with a digital multimeter?

Read this and other application notes at **www.fluke.com/library**

Fluke 87V/E2 Industrial Electrician's Combo Kit

Make industrial troubleshooting even more productive with accessories.

- 87V Industrial Multimeter
- **New!** C35 lightweight soft case to provide optimal protection and storage
- TL224 1.5 m silicone leads resist heat
- TP238 removable probes with 4 mm of exposed metal for use on industrial circuits
- AC220 retractable long reach alligator clips
- ToolPak™ meter hanging accessory to hold meter to steel surfaces
- 80BK K-type temperature probe

Features – 87V and 83V DMMs

Feature	87V Ex	87V	83V
ATEX II 2G EEx ia IICT4 safety rating for use in Zone 1 and Zone 2	•		
True-rms ac voltage and current for accurate measurements on non linear signals	•	•	
Selectable filter for accurate voltage and frequency measurements on motor drives	•	•	
0.05 % dc accuracy	•	•	
4-1/2 digit mode for precise measurements	•	•	
Built-in thermometer lets you carry one less tool	•	•	
Large display digits and two level bright white backlight for increased visibility	•	•	•
10,000 µF capacitance range for components and motor caps	•	•	•
Peak capture to record transients as fast as 250 µs	•	•	
Measure up to 1000 V ac and dc	•	•	•
Measure up to 10 A, 20 A for up to 30 seconds	•	•	•
Auto and manual ranging for maximum flexibility	•	•	•
Analog bargraph	•	•	•
Frequency to 200 kHz and % duty cycle	•	•	•
Min/Max and average recording to capture variations automatically	•	•	•
Relative mode to remove test lead resistance from low ohms measurements	•	•	•
Access door for fast battery changes without breaking the calibration seal	•	•	•

Specifications – 87V and 83V DMMs

Function	Range and resolution	Basic accuracy	
		87V	83V
DC volts	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	0.05 %	0.1 %
AC volts	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	0.7 % (true-rms)	0.5 %
DC current	600.0 µA, 6000 µA, 60.00 µA, 600.0 mA, 6.000 A, 10.00 A	0.2 %	0.4 %
AC current	600.0 µA, 6000 µA, 60.00 µA, 600.0 mA, 6.000 A, 10.00 A	1.0 % (true-rms)	1.2 %
Temperature (excl. probe)	-200 °C to 1090 °C (-328 °F to 1994 °F)	1.0 %	–
80BK Temperature Probe	-40 °C to 260 °C (-40 °F to 500 °F)	2.2 °C or 2 %	–
Resistance	600.0 Ω, 6.000 kΩ, 60.00 kΩ, 600.0 kΩ, 6.000 MΩ, 50.00 MΩ	0.2 %	0.4 %
Capacitance	10.00 nF, 100.0 nF, 1.000 µF, 10.00 µF, 100.0 µF, 9,999 µF	1.0 %	1.0 %
Frequency	199.99 Hz, 1.9999 kHz, 19.999 kHz, 199.99 kHz	0.005 %	0.005 %

Battery life: 400 hours typical with backlight off. **Size (LxWxD):** 201 mm x 98 mm x 52 mm (7.9 in x 3.8 in x 2 in). **Weight:** 355 g (22 oz)

For more information and detailed specifications, go to www.fluke.com/dmm

Included accessories

Every Fluke 83V and 87V meter comes packaged with TL75 Test Leads, AC72 Alligator Clips, holster, 9 V battery (installed), 80BK Temperature Probe (87V only) CD-ROM (users manual and technical notes) and operator's guide.

Ordering information

Fluke-87-5	Industrial True-rms Multimeter with Temperature
Fluke-87-5/E2	Industrial Electrician's Combo Kit
Fluke-83-5	Industrial Multimeter

Fluke 179 Digital Multimeter

Versatile meters for maintenance and field service

The 179 true-rms Multimeter has the features needed to find most electrical and HVAC problems. Simple to use with significant improvements over the original Fluke 70 Series like true-rms, the 179 has more measurement functions, conformance to the latest safety standards and a much larger display that's easier to view.

Features include:

- Wide 1000 V measurement range
- True-rms for precise measurement of non linear signals
- Capacitance, resistance, continuity and frequency
- Built-in thermometer (Fluke 179 only)
- Large, easy-to-read display
- Backlight for work in dimly lit areas (Fluke 177 and179 only)
- Min/Max/Avg to record signal fluctuations
- Free your hands with the optional TPAK magnetic hanger (Fluke TPAK)

Electrical safety

All inputs are protected to measurement CAT III 1000 V and CAT IV 600 V. This meter can withstand transient impulses in excess of 8000 V to help protect you from arc blasts resulting from surges and spikes.

Features – 175, 177 and 179 DMMs

Feature	179	177	175
Max voltage	1000	1000	1000
True-rms	•	•	•
Temperature	•		
Basic dc accuracy	0.09 %	0.09 %	0.15 %
Backlight	•	•	
Min/Max/Avg	•	•	•
ToolPak meter hanging kit with magnet	Opt	Opt	Opt

Specifications – 179, 177 and 175 DMMs

Function	Range and resolution	Best accuracy
DC voltage	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	± 0.09 % (Models 177 and 179) ± 0.15 % (Model 175)
AC voltage[1]	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	± 1.0 % of reading
DC current	60.00 mA, 400.0 mA, 6.000 A, 10.00 A[2]	± 1.0 % of reading
AC current[2]	60.00 mA, 400.0 mA, 6.000 A, 10.00 A[2]	± 1.5 % of reading
Resistance	600.0 Ω, 6.000 kΩ, 60.00 kΩ, 600.0 kΩ, 6.000 MΩ, 50.00 MΩ	± 0.9 % of reading
Capacitance	1000 nF, 10.00 µF, 100.0 µF, 9999 µF	± 1.2 % of reading
Frequency[3]	99.99 Hz, 999.9 Hz, 9.999 Hz, 99.99 kHz	± 0.1 % of reading
Temperature (Model 179)	–40 °C to +400 °C (–40 °F to +752 °F)	1.0 % of reading

[1]All ac voltage and ac current ranges are specified from 5 % of range to 100 % of range.
[2]10 A continuous, 20 A for up to 30 seconds.
[3]Voltage frequency is specified from 2 Hz to 100 kHz. Current Frequency is specified from 2 Hz to 30 kHz.
Battery life: 200 hours typical for alkaline. **Size (HxWxL):** 4.3 cm x 9.0 cm x 18.5 cm (1.7 in x 3.5 in x 7.3 in)

Recommended accessories – 179, 177 and 175 DMMs

L210
Probe Extender with light
See page 64

TL220
SureGrip Industrial Test Lead Set
See page 61

C510
Carrying Case
See page 70

PV350
Pressure-Vacuum Module
See page 65

i400s
AC Current Clamp
See page 66

For more information and detailed specifications, go to www.fluke.com/dmm

179/EDA2 Electronics Multimeter and Deluxe Accessory Combo Kit

- 179 True-rms Digital Multimeter
- **New!** C35 lightweight soft case to provide optimal protection and storage
- TL910 Electronic Test Probes
- TL224 SureGrip™ Silicone Test Leads resist heat
- AC280 SureGrip™ Heavy Duty Hook Clips
- 80BK Type-K temperature probe
- ToolPak™ meter hanging accessory to hold meter to steel surfaces

179/1AC-II Electrician's Multimeter and Voltage Tester Combo Kit

- 179 True-rms Digital Multimeter
- 1AC-II VoltAlert™ Non-Contact Voltage Detector
- **New!** C35 lightweight soft case to provide optimal protection and storage
- AC220 retractable long reach alligator clips
- TP220 sharp 12 mm stainless steel tip provides reliable contact
- TL224 1.5 m silicone leads resist heat
- ToolPak™ meter hanging accessory to hold meter to steel surfaces
- 80BK K-type temperature probe

Included accessories

Every Fluke 170 Series meter comes packaged with TL75 test leads, 9 V battery (installed) and manual. The Fluke 179 comes with an 80BK Temperature Probe.

Ordering information

Fluke-179	Digital Multimeter
Fluke-179/1AC-II	Electricians Combo Kit
Fluke-179/EDA2	Electronics Combo Kit
Fluke-175	Digital Multimeter
Fluke-177	Digital Multimeter

Fluke Family of True-rms Digital Multimeters

Engineered by Fluke for working professionals

Commercial electricians

Fluke 112

New

Fluke 117

- VoltAlert™ non-contact voltage detection
- LoZ low impedance input for safer troubleshooting
- Resistance, continuity, frequency and capacitance
- AC/DC voltage to 600 V, ac/dc current to 10 A

HVAC/R technicians

Fluke 12, 16

New

Fluke 116

- Temperature to 400 °C
- Resistance, continuity, frequency and capacitance
- LoZ low impedance input for safer troubleshooting
- AC/DC voltage to 600 V, ac/dc current to 600 µA

Field service technicians

Fluke 110, 111

New

Fluke 115

- Resistance, continuity, frequency and capacitance
- AC/DC voltage to 600 V
- AC/DC current to 10 A

Basic electrical

Fluke 7-600

New

Fluke 114

- LoZ low impedance input for safer troubleshooting
- Resistance and continuity
- AC/DC voltage to 600 V

Basic features	114	115	116	117
True-rms readings	ac	ac	ac	ac
Basic dc accuracy	0.5 %	0.5 %	0.5 %	0.5 %
Digits	3-1/2	3-1/2	3-1/2	3-1/2
Counts	6000	6000	6000	6000
Measurements				
Voltage ac/dc	600 V	600 V	600 V	600 V
Current ac/dc	–	10 A	600 µA	10 A
Resistance	40 MΩ	40 MΩ	40 MΩ	40 MΩ
Frequency	–	50 kHz	50 kHz	50 kHz
Capacitance	–	10 mF	10 mF	10 mF
Temperature	–	–	+400 °C	–
Display				
Analog bargraph	•	•	•	•
Large backlit display	•	•	•	•
Data storage and exchange				
Min/Max recording	•	•	•	•
Display hold/auto touch hold	•	•	•	•
Other features				
Automatic selection, LoZ	•		•	•
VoltAlert, non-contact ac voltage detector				•

For more information and detailed specifications, go to www.fluke.com/dmm

Fluke 117 and 115 True-rms Digital Multimeters

Designed for commercial electricians and field service technicians

New

Fluke 117

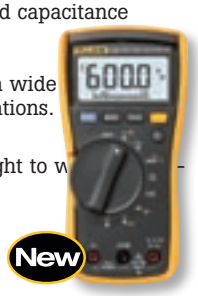
The Fluke 117 is the ideal meter for demanding settings like commercial buildings, hospitals and schools. The 117 includes integrated non-contact voltage detection to help get the job done faster.

The 117 features include:

- **VoltAlert™ Technology** for integrated non-contact voltage detection
- **AutoVolt feature** for automatic ac/dc voltage selection
- LoZ: low input impedance prevents false readings due to "ghost voltage"
- Large display and white LED backlight to work in poorly lit areas more effectively
- Compact design for one-handed operation
- Min/Max/Average to record signal fluctuations
- Compatible with optional magnetic hanger (ToolPak™) for hands free operation
- Current measurement 20 A (30 seconds momentary; 10 A continuous)
- Resistance, continuity, frequency and capacitance

Fluke 115

The new Fluke 115 is the solution for a wide
electrical and electronic testing applications.



New

The 115 features include:

- Large display and white LED backlight to w
  ly lit areas more effectively
- Compact ergonomic design for one-handed operation
- Min/Max/Average to record signal fluctuations
- Resistance, continuity, frequency and capacitance

Electrical Safety 600 V CAT III

LISTED 950 Z

N10140

Application note, literature code 1260729:

Why true-rms?

If you're measuring non-linear loads like variable frequency drives, solid state heater drives, or electronics, you need a true-rms tool to get accurate readings. Average responding meters will read low, up to 30 or 40 percent low in some cases. This application note explains what true-rms is and when you need it in your test tool.

Want to read more? Download this and other application notes at **www.fluke.com/library**

New

117/322 Electrician's Combo Kit

- 117 True-rms digital multimeter with non-contact voltage detection
- **New!** C115 Deluxe carrying case with shoulder strap
- 322 Compact clamp meter
- TL75 Hard Point Test Lead Set
- ToolPak Magnetic Meter Hanging Strap

Features – 117 and 115 DMMs

Feature	117	115
VoltAlert™	•	
AutoVolt/LoZ	•	
Analog bargraph	•	•
Large backlit digital display	•	•
True-rms for accurate measurements on non-linear loads	•	•
Min/Max recording	•	•
Display hold	•	•
3-1/2 digits	•	•
6000 counts	•	•
CAT III 600 V safety rated	•	•

Specifications – 117 and 115 DMMs

Function	Range and resolution	Best accuracy
Volts ac/dc	600 V	0.5 % + 2
Current ac/dc	10 A	1.0 % + 3
Resistance	40 MΩ	0.9 % + 2
Capacitance	1 nF to 9,999 µF	1.9 % + 2
Frequency	5 Hz to 50 kHz	0.1 % + 2
Diode	2 V	0.9 % + 2

Recommended accessories – 117 and 115 DMMs

ToolPak™
Meter Hanger
See page 71

TL220
SureGrip Industrial Test Lead Set
See page 61

C50
Carrying Case
See page 70

For more information and detailed specifications, go to www.fluke.com/dmm

Included accessories

TL75 Test leads, holster, users manual and 9 V battery (installed).

Ordering information

Fluke-117	Multimeter with Non-Contact Voltage
Fluke-117/322	Electrician's Combo Kit
Fluke-115	Multimeter

Fluke 116 and 114 Digital Multimeters

Designed for HVAC/R technicians and electrical troubleshooting

New

Fluke 116

The Fluke 116 was specifically designed for the HVAC professional. It has everything needed in an an HVAC meter including temperature and microamp measurements to quickly troubleshoot problems with HVAC equipment and flame sensors.

The 116 features include:

- Built in thermometer for HVAC applications
- Microamps to test flame sensors
- Min/Max/Average to record signal fluctuations
- Large white LED backlight to work in poorly lit areas
- Compact ergonomic design for one-handed operation
- Min/Max/Average to record signal fluctuations
- Compatible with optional magnetic hanger (ToolPak™)
- Resistance, continuity, frequency and capacitance

Fluke 114

The new Fluke 114 is the troubleshooting tool for "go/no-go" testing. It includes a feature to prevent false readings caused by ghost voltage.

The 114 features include:

- AutoVolt: Automatic ac/dc voltage selection
- LoZ: Helps prevent false readings due to gh
- Large white LED backlight to work in poorl
- Compact ergonomic design for one-handed operation
- Resistance, continuity, frequency and c

New

LISTED 950 Z

N10140

Features – 116 and 114 DMMs

Feature	116	114
Temperature measurements	•	
AutoVolt/LoZ	•	•
Analog bargraph	•	•
Large backlit digital display	•	•
True-rms for accurate measurements on non-linear loads	•	•
Min/Max recording	•	•
Display hold	•	•
3-1/2 digits	•	•
6000 counts	•	•
CAT III 600 V safety rated	•	•

Specifications – 116 and 114 DMMs

Function	Range and resolution	Best accuracy
Volts ac/dc	600 V	0.5 % + 2
Current ac/dc	10 A	1.0 % + 3
Temperature (116 only)	+400 °C	1.0 % + 18
Resistance	50 kHz	0.9 % + 2
Capacitance (116 only)	1 nF to 9,999 µF	1.9 % + 2
Frequency (116 only)	5 Hz to 50 kHz	0.1 % + 2
Diode (116 only)	2 V	0.9 % + 2

Recommended accessories – 116 Digital Multimeter

80AK
DMM Adapter
See page 69

80PK-24
SureGrip Air Temperature Probe
See page 68

80PK-8
Pipe Clamp Temperature Probe
See page 68

80BK
Integrated DMM Temperature Probe
ships with 116
See page 68

For more information and detailed specifications, go to www.fluke.com/dmm

Application note, literature code 2434064:

Fossil fuel heating equipment

This application note explains the basic principles of fossil fuel heating systems (gas and oil) and how to troubleshoot them using thermometers, DMMs, clamp meters, pressure/vacuum modules, and other accessories. The instructions cover the thermostat controls, fan controls, flame verification controls, and cad cell testing.

Want to read more? Download this and other application notes at **www.fluke.com/library**

New

116/62 HVAC Combo Kit

- Fluke 116 HVAC Multimeter with Temperature and Microamps
- Fluke 62 Infrared Thermometer
- TL75 Hard Point Test Lead Set
- ToolPak™ Magnetic Meter Hanging Strap
- **New!** C115 Deluxe carrying case with shoulder strap
- **New!** 80PK-11 Pipe Wrap Thermocouple
- Fluke 80AK Thermocouple Adapter
- Fluke 80BK B-Type Integrated Temperature Probe

Included accessories

TL75 Test Leads, 80BK Integrated Temperature Probe (116 only), holster, users manual and 9 V battery (installed).

Ordering information

Fluke-116	HVAC Multimeter with Temperature and Microamps
Fluke-116/62	HVAC Combo Kit
Fluke-114	Electrical Multimeter

Fluke 77-IV Digital Multimeter

Versatile meters for field service or bench repair

The new 77-4 digital multimeter has the features needed to repair most electrical and electronic problems. This meter is simple to use and has significant improvements over Fluke's original 70 Series with more measurement functions, conformance to the latest safety standards, and a much larger display that's easier to view.

Measures
- Wide 1000 V measurement range
- Average responding ac measurements
- 0.3 % accuracy
- 10 Amps continuous
- Frequency and capacitance
- Resistance and continuity

Features
- Large display
- Backlight for work in dim areas
- Min / Max to record signal fluctuations
- Integral holster with probe holders
- Free your hands with the optional TPAK magnetic hanger
- Auto and Manual ranging

Electrical Safety Dual Rated CAT III and CAT IV · CE · CSA C US · UL LISTED 950 Z · Made in the U.S.A.

Fluke 27 waterproof multimeter

Completely sealed for extreme conditions
Designed for U.S. military, mining and other extreme applications. A special case with o-rings prevents water from entering the input jacks, switches and fuse door. Meets military specifications for vibration, shock and water resistance.

- Waterproof design with rugged, o-ring sealer case protects rotary switch, input jacks, battery and fuse door
- Operates from -15 °C to +55 °C (5 °F to 131 °F) and 95 % relative humidity

MSHA · Electrical Safety Dual Rated CAT III and CAT IV

Fluke 73-III

The Fluke 73-III product represents one of the best selling multimeter designs of all time. It's classic simplicity combined with attractive feature set make this meter the perfect choice for electronic and automotive applications.

The 73-III features include:
- Average responding
- Measures both amps and milliamps
- Removable high impact holster
- Manual or autoranging

Features – 77-IV Digital Multimeter

Feature	Old 77	New 77-IV	Benefit
Accuracy	0.3 %	0.3 %	Same great accuracy
True-rms	No	No	Same familiar readings
Frequency	No	Yes	Built in frequency counter
Capacitance	No	Yes	Test components
Maximum ac voltage	750	1000	Wider measurement range
Min/Max/Average	No	Yes	Capture transients automatically
Display backlight	No	Yes	Usable in dim areas
Battery door	No	Yes	Fast battery changes
Probe holders	No	Yes	One-hand operation
Overvoltage category safety rating	Not rated	600 V CAT IV	Higher level of protection
Optional magnet hanger	No	Yes	Position meter in best location

Specifications – 77-IV Digital Multimeter

Function	Range	Best accuracy	Best resolution
V dc	600.0 mV to 1000 V	± (0.3 % + 1)	0.1 mV
V ac	6.000 V to 1000 V	± (2.0 % + 2)	1.0 mV
A dc	60.00 mA to 10 A	± (1.5 % + 2)	0.01 mA
A ac	60.00 mA to 10 A	± (2.5 % + 2)	0.01 mA
Resistance	600.0 Ω to 50 MΩ	± (0.5 % + 1)	0.1 Ω
Capacitance	1 nF to 9,999 µF	± (1.2 % + 2)	1 nF
Frequency	99.99 Hz to 99.99 kHz	± (0.1 % + 1)	0.01 Hz

Recommended accessories – 77-IV Digital Multimeter

i400s
AC Current Clamp
See page 66

C35
Meter Case

ToolPak™
Meter Hanger
See page 71

For more information and detailed specifications, go to www.fluke.com/dmm

Fluke 77-IV included accessories
TL75 test leads, 9 V battery (installed) and manual.

Fluke 27 included accessories
TL75 test leads, alligator clips, 9 V battery (installed) and manual.

Ordering information

Fluke-77-4	Digital Multimeter
Fluke-73-3	Digital Multimeter
Fluke-27-YEL	Multimeter

Complete automotive diagnostic tools

Tools designed to help you *beat the book*

Fluke 88V Automotive Multimeter

The Fluke 88V Automotive Multimeter is designed to help automotive professionals beat the book. This DMM has more measurement functions, troubleshooting features and accuracy to solve virtually any problems on conventional and hybrid vehicles.

- Automotive test functions include dc and ac voltage, resistance and current
- Min/Max recording for logging the highest and lowest readings over time
- Frequency measurements for magnetic sensors and ac/dc frequency signals
- Duty Cycle for variable duty cycle signals with selectable trigger slope and level
- Pulse width for fuel injector on time measurements
- Conductance testing for secondary ignition coils
- RPM measurements for DIS and conventional ignition systems
- Built-in thermometer

Fluke 73-III (see pg 19 for details)

- Simple interface for one-handed operation
- Current measurement (A and mA)
- Auto or manual ranging

LIMITED LIFETIME WARRANTY

Hybrid Ready

Application note, literature code 1547394:

Beat the book

This amazing reference covers test procedures commonly used by experienced automotive technicians. Covers basic troubleshooting techniques and measurements using a DMM and describes tests for the charging system, starting system, fuel and air system, ignition system, and the body electric/engine management/cooling system.

Want to read more? Download this and other application notes at **www.fluke.com/library**

For the complete diagnostics package and maximum value, pick up the 88V/A combo kit.

- Includes Fluke 88 Series V Automotive Multimeter
- TL224 Heat Resistant Silicone Test Leads
- TP220 Removable Sharp Point Test Probes
- AC285 Large Jaw Alligator Clips
- TPAK Magnetic Hanger
- 80BK Temperature Probe
- RPM80 Inductive Pick-up
- Automotive Backprobe Pins
- Insulation Piercing Probe
- Packaged in a durable carrying case (C800)

Features – 88V and 73 DMMs

Feature	88V	73
Digital display with analog bargraph	•	•
Continuity for detecting opens and shorts	•	•
Diode test for alternator testing	•	•
Peak Min/Max captures intermittence as fast as 250 microseconds	•	
Min/Max average to monitor trends in oxygen sensor values for fuel trim	•	
Pulse width for fuel injector on time measurements	•	
Milliamp ranges to find low current parasitic drains	•	
Lo-Ohms (.01 Ω) for low resistance sensor and coil measurements	•	
Duty cycle for pulse width modulated signals	•	
RPM for ignition systems	•	
Temperature for coolant and air temperature sensors	•	
Dwell for points and feedback carburetors		
Limited lifetime warranty	•	•

Buy accessory kits and save

TLK281
Automotive Test Lead Kit
See page 61

TLK282
Deluxe Automotive Test Lead Kit
See page 61

TL28A
Automotive Test Lead Set
See page 62

TL82
Automotive Pin & Socket Adapter Set
See page 63

Recommended automotive accessories – 88V DMM

TP81 or TP82
Insulation Piercing Probes
See page 63

TP84
Oxygen Sensor Insulation Piercing Probe
See page 63

TP88
Rigid Backprobe Pin Set
See page 63

TP40
Automotive Back Probe Pin Set
See page 63

For more information and detailed specifications, go to www.fluke.com/dmm

Fluke 88V included accessories

Test leads, 9 V battery (installed), RPM pickup, carrying case and users manual.

Ordering information

Fluke-88-5	Automotive Multimeter
Fluke-88-5/A KIT	Automotive Multimeter Combo Kit
Fluke-73-3	Digital Multimeter

Fluke 8845A and 8846A 6.5 Digit Precision Multimeters

Precision and versatility for bench or systems applications

New

Fluke 8845A

New

Fluke 8846A

True-rms

UL LISTED

The Fluke 8845A and 8846A, 6.5 digit precision multimeters have the precision and versatility to handle your most demanding measurements on the bench or in a system.

Dual display offers versatile graphical capabilities: The 8845A and 8846A feature a unique graphical display that can reveal signal quality issues like drift, intermittent and stability by viewing the measurement data as a real time TrendPlot,™ Histogram or Statistics using the unique analyze mode.

Wide measurement ranges: Resistance or current has been extended to cover the widest range possible.

Perform 4-wire measurements easily with two leads: Patented split terminal jacks for 2x4 ohms function allow you to perform precise 4-wire measurements with only two leads instead of four. Optional Kelvin leads accessories are available to enable you to establish a 4-wire connection even in tight spaces.

Systems capabilities: Both instruments include an RS-232, IEEE-488 and Ethernet interface as standard, with popular DMM emulation modes that make systems integration a simple task.

Software: Transfer data points from your meter to your PC with the free copy of FlukeView Forms Basic. To customize your forms, upgrade with FVF-UG.

Application note, literature code 2547797:

Understanding specifications for precision multimeters

A solid understanding of specifications is critical when you're evaluating the suitability of DMMs for an application, or when you must be confident that your readings accurately reflect reality. This application note discusses some of the thinking behind DMM specifications and spec sheets. It defines the various elements of DMM specs and gives tips on how to apply them.

Want to read more? Go to **www.fluke.com/library** to download this and other application notes, or get info specific to your industry and sign up for Fluke News publications at **www.fluke.com/subscribe**.

Features – 8845A and 8846A

Feature	8845A	8846A
Display	Dual VFD Dot Matrix	
Resolution	6.5 Digits	
Continuity / Diode Test	Yes	
Analytical Functions	Statistics, Histogram, TrendPlot™, Limit Test	
Math Functions	Zero, Min/Max/Average, Std Dev; mx + b, dB/dBm	
USB Device Port	–	USB memory drive port
Real Time Clock	–	Yes
Interfaces	RS-232, IEEE-488.2, Ethernet, USB (with optional adapter)	
Programming Languages/Emulation Modes	SCPI (IEEE-488.2), Agilent 34401A, Fluke 45	
Safety	Designed to comply with IEC 61010-2000-1, ANSI / ISA-S82.01-1994, CAN / CSA-C22.2 No.1010.1-92 1000 V CAT I / 600 V CATII	

Use the built-in TrendPlot paperless chart recorder to graphically identify the extent of drift and intermittent events in analog circuits.

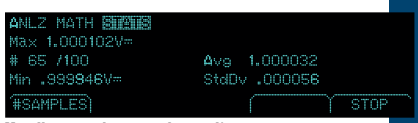
View results in Histogram mode to reveal stability or noise problems in analog circuits.

Specifications – 8845A and 8846A

	8845A			8846A		
Function*	**Range**	**Resolution**	**Accuracy* (%)**	**Range**	**Resolution**	**Accuracy* (%)**
Voltage dc	1000 V	100 nV	0.0035	1000 V	100 nV	0.0024
Voltage ac (freq. 300 Hz)	750 V	100 nV	0.06	1000 V	100 nV	0.06
Resistance (2x4 wire)	100 MΩ	100 µΩ	0.01	1 GΩ	10 µΩ	0.01
Current dc	10 A	100 pA	0.05	10 A	100 pA	0.05
Current ac (freq. 3 Hz to 10 kHz)	10 A	1 µA	0.10	10 A	10 nA	0.10
Freq/period	300 kHz	1 µHz	0.01	1 MHz	1 µHz	0.01
Capacitance	–	–	–	1 nF to 0.1 F	1 pF	1
Temperature RTD	–	–	–	-200 °C to +600 °C	0.001°	0.06°

*Accuracy = ± (% of reading)

Size (HxWxD): 88 mm x 217 mm x 297 mm (3.45 in x 8.54 in x 11.69 in) **Weight:** 3.6 kg (7.9 lb) **One-year warranty**



Handle even the most demanding measurements with high accuracy and 6.5 digit resolution.

Recommended accessories – 8845A and 8846A Precision Multimeters

TL2X4W-PT
2x4 Wire Ohms Test Lead 2 mm probe tip

TL2X4W-TWE
2x4 Wire Ohms Tweezer

884X-512M
USB Memory 512M

FVF-UG
FlukeView Forms Software Upgrade

For more information and detailed specifications, go to www.fluke.com/884X

Included accessories

LCI Line Power Cord, TL71 Test Lead Set, Spare Line Power fuse, Programmers Manual/User Manual on CD-ROM, FVF-BASIC FlukeView Forms Software Basic Version.

Ordering information

Fluke-8845A	6.5 Digit Precision Multimeter, 35 ppm
Fluke-8846A	6.5 Digit Precision Multimeter, 24 ppm

Fluke T5 and T3 Electrical Testers

FLUKE®

Fluke T5 Voltage, Continuity and Current Tester

- Excellent front-line troubleshooting and measurement tool
- Available in 600 V and 1000 V models
- Digital display
- OpenJaw™ current measurement
- Rotary switch selects volts, amps and ohms functions
- Heavy-duty test leads

Fluke T3 Voltage and Continuity Tester

- LED voltage indicators
- Seven key voltage levels
- Automatically switches to continuity beeper or ac/dc voltage
- Heavy-duty test leads

Specifications – T5 and T3 Testers

	T5-1000	T5-600	T3
Measure dc voltage	1000 V	600 V	Preset 6 V, 12 V, 24 V, 36 V, 48 V, 110 V and 220 V*
Measure ac voltage	1000 V	600 V	Preset 24 V, 48 V, 120 V, 208 V, 240 V, 277 V and 480 V*
Measure ac current (average)	100 A	100 A	N/A
Measure continuity	< 25 Ω	< 25 Ω	< 20,000 Ω
Measure resistance	1000 Ω	1000 Ω	N/A
DC polarity indicator	Yes	Yes	Yes
Detachable probe tips with optional probe tips styles	Yes	Yes	N/A
Safety rating	1000 V Overvoltage CAT III	600 V Overvoltage CAT III	1000 V Overvoltage CAT III
Warranty	Two-years	Two-years	One-year

* Voltage levels will vary depending on country of intended use.

Buy Electrical Tester Kits and Save

T3 Tester Kit
Combo kit includes:
- Fluke T3 Voltage and Continuity Tester
- Fluke VoltAlert™

T5-1000 Tester Kit
Combo kit includes:
- Fluke T5-1000 Voltage Electrical Tester
- Fluke VoltAlert™
- Fluke H5 Holster

VoltAlert™ Multi Pack
Includes five Fluke VoltAlerts. The special kit pricing gets you the fifth VoltAlert™ free. Outfit your entire staff.

Recommended accessories – Electrical Testers

H5
Electrical Tester Holster
See page 70

AC285 (T5)
SureGrip™ Alligator Clips
See page 62

Meter Cleaner
Cleaning Wipes
See page 71

T5 Kit
Starter Kit
See page 61

C520A
Leather Tool Case
See page 70

For more information and detailed specifications, go to www.fluke.com/tseries

Fluke 9040 Rotary Field Indicator

The Fluke 9040 is a premium phase rotation tester with a CAT III, 600 V rating. The frequency range is from 15 Hz to 400 Hz for demanding applications. The clear liquid crystal display and the holster make it suitable for rough outdoor applications. This instrument is supplied with three unique, expandable, test probes which fit most sockets.

For more information, visit **www.fluke.com/9040**

Fluke 1AC-II/1LAC-II VoltAlert

The pocket-sized voltage detector
The next generation VoltAlert™ ac non-contact voltage testers from Fluke are easy to use—just touch the tip to a terminal strip, outlet, or supply cord. When the tip glows red and the unit beeps, you know there is voltage present. Electricians, maintenance, service, safety personnel and homeowners can quickly test for energized circuits in the workplace or at home. Certified up to CAT IV 1000 V.

Two models to choose from:
- **1AC-II** – detects voltage from 90 V ac to 1000 V ac
- **1LAC-II** – detects voltage from 20 V ac to 90 V ac

Included accessories

The T5-1000 and T5-600 come with detachable probes and instruction sheet. The T3 has fixed test leads and probes.

Ordering information

T5-1000	1000 V Voltage, Continuity and Current Tester
T5-600	600 V Voltage, Continuity and Current Tester
T3	Voltage and Continuity Tester
T3-1AC Kit	Voltage and Continuity Tester Kit
T5-H5-1AC Kit	Voltage, Continuity and Current Tester Kit
1AC-II 5PK	VoltAlert 5 Pack
1AC-II	Voltage Detector
1LAC-II	Voltage Detector
9040	Rotary Field Indicator

Fluke 1625 and 1623 Geo Earth Ground Testers

Advanced technology for all your earth ground testing applications

Fluke 1623

Fluke 1625

The new Fluke 1620 Series Earth Ground Testers not only measure ground resistance using the classic 'fall of potential test' but also enable time saving testing using the 'selective' and 'stakeless' methods. 'Selective' testing does not require the electrode under test to be disconnected during the measurement, thus increasing safety. The simple 'stakeless' method quickly checks ground connections using two current transformers (probes) clamped around the ground conductor under test. Offering 'one-button' simplicity, the 1623 is an all-in-one earth ground tester, while the 1625 has extra versatility for more demanding applications.

Earth ground resistance and soil resistivity should be measured when:

- Designing earth ground systems
- Installing new ground system and electrical equipment
- Periodically testing ground and lightning protection systems
- Installing large electrical equipment such as transformers, switchgears, machines, etc.

The 1623 is perfect for performing predictive maintenance checks of commercial and industrial applications. The 1625 is intended for electrical utility or other high frequency environments.

Brochure, literature code 2633834:

Earth Ground Resistance: Principles, testing methods and applications

This brochure is a highly informative collection of information about Earth Ground Systems, testing methods and applications.

Want to read more? Download this and other application notes at **www.fluke.com/library**

Features – 1625/1623 Earth Ground Testers

Feature	1625	1623
One-button measurement concept		•
3- and 4-pole earth ground measurement	•	•
4-Pole soil resistivity testing	•	•
2-Pole resistance measurement ac	•	•
2-and 4-pole resistance measurement dc	•	
Selective testing, no disconnection of ground conductor (1 clamp)	•	•
Stakeless testing, quick ground loop testing (2 clamps)	•	•
Measuring frequency 128 Hz		•
Earth impedance measurement at 55 Hz	•	
Automatic frequency control (AFC) (94 Hz to 128 Hz)	•	
Measuring voltage switchable 20/48V	•	
Programmable limits, settings	•	
Continuity with buzzer	•	
Dust/water resistance	IP56	IP56
Safety rating	CAT II 300 V	CAT II 300 V

Battery type: 6 x AA alkaline cells
Size (HxWxD): 110 mm x 180 mm x 240 mm (4.33 in x 7.08 in x 9.45 in)
Weight (including batteries): 1623 Geo: 1.1 kg (2.42 lb); 1625 Geo: 1.5 kg (3.31 lb)
Two-year warranty

Recommended accessories – 1625 and 1623 Earth Ground Testers

EI-1623
Selective/stakeless clamp set for 1623

EI-1625
Selective/stakeless clamp set for 1625

ES-162P3
Stake/reel set for 3 pole measurements

ES-162P4
Stake/reel set for 4 pole measurements

For more information and detailed specifications, go to www.fluke.com/egt

Included accessories

Fluke 1625 Tester: 2 test leads, 2 alligator clips, and users manual.

Fluke 1625 Kit: Same as above plus stake/reel set 4 pole, selective/ stakeless clamp set, and rugged carrying case.

Fluke 1623 Tester: 2 test leads, 2 alligator clips, and users manual.

Fluke 1623 Kit: Same as above plus stake/reel set 4 pole, selective/ stakeless clamp set, and rugged carrying case.

Ordering information

Fluke-1625	Advanced GEO Earth Ground Tester
Fluke-1625 Kit	Advanced GEO Earth Ground Tester Kit
Fluke-1623	Basic GEO Earth Ground Tester
Fluke-1623 Kit	Basic GEO Earth Ground Tester Kit

These products are for unpowered installations measuring grounding connections.

Fluke 1630 Earth Ground Clamp Meter

Measure earth ground loop resistance anywhere. Quickly and easily.

The Fluke 1630 Earth Ground Clamp is able to measure ground loop resistances—using the Stakeless testing method. This test technique eliminates the dangerous, and time consuming activity of disconnecting parallel grounds, as well as the process of finding suitable locations for auxiliary ground stakes. You can also perform earth ground tests in places you have not considered before: inside buildings, on power pylons or anywhere you don't have access to soil.

With the Stakeless testing method, the Fluke 1630 Earth Ground clamp is placed around the earth ground rod or the connecting cable. No earth ground stakes are used at all. A known voltage is induced by one half of the clamp and the current is measured by the other half. The tester automatically determines the ground loop resistance at this grounding connection. Gone are the days of spending time placing and connecting stakes for each earth ground rod on your system—a major time saver.

- Quick and easy use—no earth ground stakes are necessary
- Large, 35 mm (1.35 in) jaw opening
- Measures ground resistance from 0.025 Ω to 1500 Ω
- Measures ground leakage current from 0.2 mA to 30 mA
- High and Low alarming
- Automatic self calibration
- Rugged carrying case and resistance check loop included

What is ground, and what does it do?

The NEC, National Electrical Code, defines a ground as a "conducting connection, whether intentional or accidental between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth."

When talking about grounding it is actually two different subjects, earth grounding and equipment grounding. Earth grounding is an intentional connection from a circuit conductor usually the neutral to a ground electrode placed in the earth. Equipment grounding is to ensure that operating equipment within a structure is properly grounded.

These two grounding systems are required to be separate except for a connection between the two systems to prevent differences in potential from a possible flashover from a lightning strike. The purpose of a ground besides the protection of people, plants and equipment is to provide a safe path for the dissipation of fault currents, lightning strikes, static discharges, EMI and RFI signals and interference.

Handy GEO Earth Ground Tester

Earth ground tester for resistance measurement

The Handy GEO Earth Ground Tester is a rugged, easy-to-use tester for three-pole ground resistance measurements and two-pole ac resistance measurements.

Earth ground resistance is measured by installing earth ground test electrodes and testing with the Handy GEO. Earth ground resistance measurements are used to ensure safe operation and reduce power quality problems. The Handy GEO is extremely lightweight making it ideal to test for lightning protection levels and periodic check-ups during routine maintenance.

Two-pole ac resistance is measured to confirm low resistance between electrical joints:

- Fuse-to-fuse holder (to ensure there is no overheating)
- Bonding of ground earth connections
- Additional bonding
- Cable to terminal connections

AC current can be used to confirm the low resistance path in two directions simultaneously.

The gold standard for measuring ground resistance using classic fall of potential as well as selective and stakeless methods.

Included accessories

Fluke 1630 Clamp Meter: Rugged carrying case with belt, resistance test loop, 9 V battery and users manual.

Handy GEO Tester: Rugged rubber holster with carrying belt, battery, and operating instructions.

Ordering information

Fluke-1630	Earth Ground Clamp Meter
Handy GEO	Earth Ground Tester
Handy GEO Kit	Earth Ground Tester Kit with 25 m and 50 m cable reel and two earth ground stakes

These products are for unpowered installations measuring grounding connections.

For more information and detailed specifications, go to www.fluke.com/egt

Fluke 430 Series Three-Phase Power Quality Analyzers

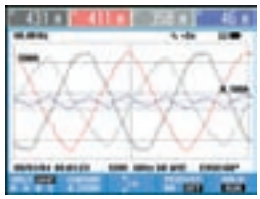
Pinpoint power problems faster, safer and in greater detail

Fluke 435

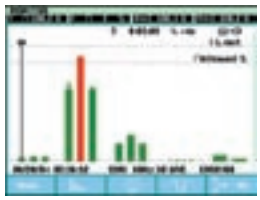
Fluke 434

The Fluke 435 and 434 Three-Phase Power Quality Analyzers help you locate, predict, prevent and troubleshoot problems in three- and single-phase power distribution systems. Troubleshooting is faster with on-screen display of trends and captured events, even while background recording continues. The new IEC standards for flicker, harmonics, and power quality are built right in to take the guess work out of power quality.

- **Troubleshoot real-time:** Analyze the trends using the cursors and zoom tools—even while background recording continues
- **AutoTrend:** Every measurement you see is always automatically recorded, without any setup



- **Automatic Transient Mode:** Capture 200 kHz waveform data on all phases simultaneously up to 6 kV
- **Measure all three phases and neutral:** With included four current probes
- **Fully Class-A compliant:** Conduct tests according to the stringent international IEC 61000-4-30 Class-A standard



- **System-Monitor:** Up to ten power quality parameters on one screen according to EN50160 power quality standard
- **Inrush mode:** For troubleshooting nuisance circuit breaker tripping
- **Logger function:** Configure for any test condition with memory for over 400 parameters at user defined intervals

Features – 435 and 434 PQ Analyzers

Features	435	434*
Measures voltage, current, dips, swells, interruptions, harmonics, inter-harmonics, flicker, power, energy, transients, frequency, unbalance, inrush, EN50160 overview	•	•
Logger function with multi-parameter logging	•	optional*
Mains signaling	•	optional*
Memory size	16 MB	8 MB
Current probes	3000 A flexible (4)	40 A/400 A clamp (4)
Carrying case	water-tight hard case with rollers	rugged hard case
Software	Fluke Power Log and FlukeView®	FlukeView®

*Optional functionality can be added with upgrade kit.

Recommended accessories – 435 and 434 PQ Analyzers

I5sPQ3
3 pack of 5 A precision current clamps

i430-flex-4pk
4 pack of 3000 A flexible current probes

C435
Water-tight hard case with rollers

GPS430
GPS time synchronization module

For more information and detailed specifications, go to www.fluke.com/pq

Application note, literature code 2435490:

Six simple ways to reduce costs with a Fluke 434 Power Quality Analyzer

There are hundreds of power quality measurements you can take on electrical systems and equipment. These instructions focus on four predictive maintenance (PdM) measurements and two power consumption measurements that can help you uncover hidden costs, protect equipment from damaging conditions, reduce unscheduled downtime, and improve system performance.

Included accessories

Fluke 435 Analyzer: Hard carrying case with rollers, four flexible current probes (i430-flex), five test leads and clips, battery charger, FlukeView software, Power Log software, optical USB cable, color localization set, getting started manual, users manual on CD-ROM.

Fluke 434 Analyzer: Hard carrying case, four current probes (i400s), five test leads and clips, battery charger, FlukeView software, optical USB cable, color localization set, getting started manual, users manual on CD-ROM.

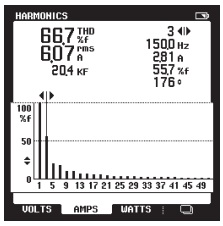
Ordering information

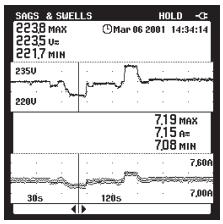
Fluke-435	Three-Phase Power Quality Analyzer
Fluke-434	Three-Phase Power Quality Analyzer

Fluke 43B Power Quality Analyzer

Power quality analysis plus a scope and a meter

The Fluke 43B Power Quality Analyzer performs the measurements you need to maintain power systems, troubleshoot power problems, and diagnose equipment failures. The 43B has 20 storage locations and can store data as well as screens.





- NiMH battery provides extended operating time of 6.5 hours
- Voltage, current and power harmonics up to 51st
- Total harmonic distortion (THD)
- Phase angle of individual harmonics
- FlukeView® software with enhanced analysis and documentation capabilities
- Continuously measure volts and amps cycle-by-cycle for up to 16 days
- Cursors give time and date of sags and swells

Application note, literature code 2391563:

The costs of poor power quality

Productivity is the key to survival in today's global competitive environment. Power quality problems can cause processes and equipment to malfunction or shut down. And the consequences can range from excessive energy costs to complete work stoppage. Obviously, power quality is critical.

To reduce your power bill, you need to record consumption patterns and adjust the system and load timing to reduce one or more of the following:

1. Actual power (kWh) usage
2. Power factor penalties
3. A peak demand charge structure

Want to read more? Download this and other application notes at **www.fluke.com/library**

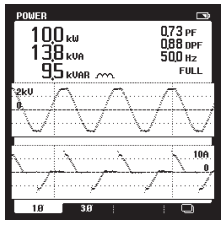
Specifications – 43B Analyzer

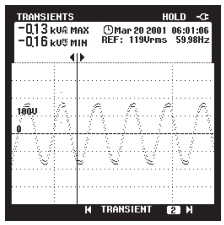
Function	Fluke 43B*
Volts/Amps/Hz	
Volts rms	± (1 % + 10 counts)
Amps rms	± (1 % + 10 counts)
Frequency (Hz)	± (0.5 % + 2 counts)
Crest Factor (CF)	± (5 % + 1 count)
Sags and swells	± (2 % +10 counts)
Power	
W, VAR, VA	± (2 % + 6 counts)
PF, Cos ((DPF)	± 0.04
Harmonics and THD	
Harmonics	± 3 %
THD	± 3%
Transient display	
Minimum transient detection	40 ns
Inrush current	± 5 % of full scale
Additional capabilities	
AutoTrend	•
Real time scope	•
Ohms, diode, continuity, capacitance	•
Memory (screens/data)	20 (screens, settings, data)
FlukeView software and interface cable	Standard

*Not including current probe specifications

Battery life: Rechargeable NiMH pack (charger included), 6.5 hours typical (continuous)
Shock and vibration: Mil 28800E, Type 3, Class III, Style B
Operating temperature: 0 °C to 50 °C (32 °F to 122 °F)
Case: IP51 (dust, drip waterproof)
Size (HxWxD): 232 mm x 115 mm x 50 mm (9.1 in x 4.5 in x 2 in)
Weight: 1.1 kg (2.5 lbs)
Safety: IEC 1010-1, CAT III 600 V. Tested and approved to UL 3111-1, CSA C.22.2 No. 1010.1-92.
Warranty: Three-years on Fluke 43B, one-year on accessories

- Watts, power factor, displacement power factor, VA and VAR
- Voltage and current waveforms
- Calculates three-phase power on balanced loads from a single-phase measurement
- Catch up to 40 voltage transients and waveform distortions





Recommended accessories – 43B Analyzer

i1000s
AC Current Probe
See page 66

i2000flex
AC Current Clamp
See page 66

TLK225
SureGrip Master Accessory Kit
See page 61

C43
Carrying Case
See page 70

Included accessories

The Fluke 43B includes a hard case, voltage and current probes, FlukeView® software, power quality instructional CD, USB interface cable, line voltage adapter/battery charger and users manuals.

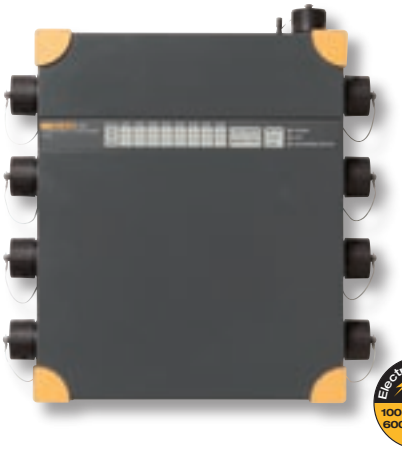
Ordering information

Fluke-43B Power Quality Analyzer

For more information and detailed specifications, go to www.fluke.com/pq

Fluke 1760 Power Quality Recorder *Topas*

Class-A compliance for the most demanding power quality tests



The Fluke 1760 Three-Phase Power Quality Recorder is the ideal portable instrument for power quality experts. It is fully compliant to IEC 61000-4-30 Class-A, for advanced power quality analysis and consistent compliance testing. Designed for analysis of utility and industrial power distribution systems, in medium- and low-voltage networks, the Fluke 1760 provides the flexibility to customize thresholds, algorithms, and measurement selections. It captures the most comprehensive details on user-selected parameters and allows for later analysis and reporting.

- **Fully Class-A compliant:** Conduct tests according to the stringent international IEC 61000-4-30 Class-A standard
- **GPS time synchronization:** Correlate data with events or datasets from other instruments, with precision
- **Flexible and fully configurable thresholds and scale factors:** Allows user to pinpoint specific issues by defining the detailed criteria for detection and recording of disturbances.
- **Highest safety rating in the industry:** 600 V CAT IV/1000 V CAT III rated for use at the service entrance
- **Uninterrupted power supply (40 minutes):** Never miss important events—even record the beginning and end of interruptions and outages, to help determine the cause
- **10 MHz, 6000 Vpk waveform capture:** Get a detailed picture of even the shortest event
- **2 GB data memory:** Enables detailed, simultaneous recording of numerous power parameters for long periods of time
- **Comprehensive software included:** Provides trend diagrams for root cause analysis, statistical summaries, report writing, and real-time data monitoring in the online mode
- **Plug and play:** Allows quick setup with automatic sensor detection; sensors are instrument powered, eliminating the need for batteries
- **Rugged field design:** Insulated housing and a solid state design with no rotating components, enable reliable testing under nearly any conditions

For more information and detailed specifications, go to www.fluke.com/pq

Application note, literature code 2555030:

What does Class A mean to me?

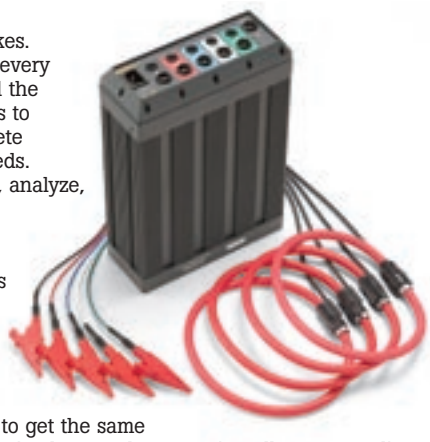
The new IEC 61000-4-30 Class A standard takes the guesswork out of selecting a power quality instrument. The standard IEC 61000-4-30 Class A defines the measurement methods for each power quality parameter to obtain reliable, repeatable and comparable results. It also defines the accuracy, bandwidth, and minimum set of parameters. Going forward, manufacturers can begin designing to Class A standards, giving technicians a level playing field to choose from and increasing their measurement accuracy, reliability, and efficiency on the job.

Fluke 1650 RPM Power Recorder

Power recorder

Fewer connections, shorter set up, less mistakes. Patented Full-Disclosure technology captures every measurement, every event, on every cycle, all the time—without thresholds. From simple set-ups to finished reports, the Fluke 1650 is the complete solution to your portable power recording needs. The Power Recorder is all you need to record, analyze, and document:

- Loading and load interaction
- Power consumption and demand
- Sags, swells, harmonics or transient events
- Ground currents
- Phase relationships, including phase imbalance



Multipoint

For permanent installations, select Multipoint to get the same performance as the portable Power Recorder—simultaneously measuring all power quality parameters, as well as power consumption and harmonics.

For more information and detailed specifications, go to www.fluke.com/pq

Included accessories

Fluke 1760 Recorder: Voltage probes (4), current probes (4), ethernet cable for network connection (1), crosslink ethernet cable for direct PC connection (1), mains cable (1), GPS time sync receiver, PC software on CD-ROM, operators manuals and carrying case.

Fluke 1650 Recorder: Five flexible current probes (four 1000 A and one 100 A), PAS software with report writer, ethernet cable and manual.

Ordering information

Fluke-1760	Without fast transient, voltage or current option
Fluke-1760TR	With fast transient option
1695-Flexi Pack	Power Recorder

These power quality recorders are sold exclusively through power quality representatives. To request a demonstration, or to order, call 1-888-257-9897 or email questions to **fpqsupport@fluke.com**.

Many configurations and accessories are available for these recorders, go to **www.fluke.com/pq** for more information.

Fluke 1740 Series Three-Phase PQ Loggers *Memobox*

Assess power quality and conduct long-term studies with ease

Fluke 1744/1743

Fluke 1745

Compact and rugged, the Fluke 1740 Series Three-Phase Power Quality Loggers are everyday instruments for technicians who troubleshoot and analyze power distribution systems. Capable of simultaneously logging up to 500 parameters for up to 85 days and capturing events, the Fluke 1740 Series helps uncover intermittent and hard-to-find power quality issues. The included PQ Log software quickly assesses the quality of power at the service entrance, substation, or at the load, according to the latest EN50160 standard.

- **Plug and play:** Setup in minutes with automatic current probe detection and powering
- **Installs inside the cabinet:** Compact, fully-insulated housing and accessories fit easily in tight spaces, next to live power
- **Determines the root cause:** Included PQ Log software quickly analyzes trends, creates statistical summaries, and generates detailed graphs and tables
- **Monitors power for the long-term:** Data can be downloaded during recording without interruption
- **Measure voltage with premium accuracy:** IEC61000-4-30 Class-A compliant voltage accuracy (0.1 %)
- **Quickly validate quality of power:** Assess power quality according to EN50160 power quality standard, with statistical overview
- **Rugged and reliable:** Designed for everyday field use, with no moving parts and durable, insulated case, with two-year warranty

Features – 1740 Series PQ Loggers

Features	1745	1744	1743
Measurement of common power parameters: V, A, W, VA, VAR, PF, energy, flicker, voltage events, and THD	•	•	•
Measurement of voltage and current harmonics to the 50th, unbalance, and mains signaling	•	•	
Dust/water resistance	IP50	IP65 water proof	
Display	LED + LCD	LED	LED
UPS ride-through	5 hours	3 s	3 s
Dimensions (HxWxD)	282 mm x 216 mm x 74 mm (11.5 in x 8.8 in x 3 in)	170 mm x 125 mm x 55 mm (6.9 in x 5.1 in x 2.2 in)	

Recommended accessories – 1740 Series PQ Loggers

MBX CLAMP 1 A/10 A + N
3-phase+N current clamps
2 m cable

MBX 300 POLESET
Pole mounting kit for 1743 and 1744

C435
Water-tight hard case with rollers

For more information and detailed specifications, go to www.fluke.com/pq

Fluke VR101S Voltage Event Recorder System
Power tools for power quality

The VR101S is the perfect system for catching sags, swells, transients, outages, and frequency variations on line voltage at receptacles.

The VR101S is a starter system that includes a compact VR101 event recorder, an optical interface cable, and EventView® software that turns your PC into a power quality reporting tool. The VR101S is covered by a one-year warranty.

For more information and detailed specifications, go to www.fluke.com/vr101

Application note, literature code 2646555:

Power quality recording and analysis: Techniques and applications

Hooking up a power quality recorder and taking days' worth of data can give you a rich picture of your power. In this article we'll talk about the various recording techniques available in power loggers and recorders-understanding the tools and techniques you have available will be key to your strategy. What should you be looking for? And when does recording make sense?

Want to read more? Go to **www.fluke.com/library** to download this and other application notes, or get info specific to your industry and sign up for Fluke News publications at **www.fluke.com/subscribe**.

Included accessories

Fluke 1740 Series: 4 Flexible probes 15/150/1500/3000 A with 2 m cable, PQ Log software, RS-232 interface cable and RS-232-USB adapter, 4 black dolphin clips, test leads for voltages and power supply, color localization kit, carrying bag, test certificate with measurement values, printed English manual and multi-language manual CD.

VR101S: VR101, optical interface cable, and EventView software on CD.

VR101: Instruction sheet.

Ordering information

Fluke-1743	Power Quality Logger – Memobox
Fluke-1744	Power Quality Logger – Memobox
Fluke-1745	Power Quality Logger – Memobox
VR101S	Voltage Event Recorder System
VR101	Voltage Event Recorder

Note: At least one VR101S is required for proper operation.

Fluke 1735 Three-Phase Power Logger

Electrical load studies, energy consumption testing, and general power quality logging

The Fluke 1735 Three-Phase Power Logger is the ideal electrician or technician's tool for conducting energy studies and basic power quality logging. Set up the 1735 in seconds, with the included flexible current probes and color display. The 1735 logs most electrical power parameters, harmonics and captures voltage events.

- Record power and associated parameters for up to 45 days
- Monitor maximum power demand over user-defined averaging periods
- Prove the benefit of efficiency improvements with energy consumption tests
- Measure harmonic distortion caused by electronic loads
- Improve reliability by capturing voltage dips and swells from load switching
- Easily confirm instrument setup with color display of waveforms and trends
- Measure all three phases and neutral with included 4 flexible current probes
- View graphs and generate reports with included Power Log software
- Compact, rugged design with IP65 case, 600 V CAT III and two-year warranty

Recommended accessories – 1735 Three-Phase Power Logger

MBX Clamp 1 A/10 A
3 precision dual range current clamps (1 A/10 A)

MBX Clamp 5 A/50 A +N
4 precision dual range current clamps (5 A/50 A)

C435
Water-tight hard case with rollers

Application note, literature code 2584800:

30 Day Load Studies with the Fluke 1735 Power Logger

When a building owner wants you to add new loads to an existing service or set of feeders, the first thing you have to is determine whether the existing system will support the new loads. If you have a 600 amp service installed in a facility, can you add another 100 amps of load?

To answer this question you have to ask another one: What is the highest load the system carries now? Often, local electrical authorities will need to know these answers before they issue permits.

Want to read more? Go to **www.fluke.com/library** to download this and other application notes, or get info specific to your industry and sign up for Fluke News publications at **www.fluke.com/subscribe**

Norma 4000 and 5000 High Precision Power Analyzers

The Norma High Precision Power Analyzers deliver precise measurements of single or three-phase current and voltage as well as calculation of power and other derived values. They provides class-leading accuracy for any waveform, frequency or phase shift. Its 144 mm (5.7 in) color display makes it easy to use both in the field and as a table unit in labs and on test benches.

Configurations	
Number of channels	NORMA 4000: 1 phase or 3 phase; NORMA 5000 and 2x3 phases
Basic accuracy	0.05 % to 0.3 % ± rdg depending on options
Sample rate	1 MHz, 1/3 MHz or 0.1 MHz depending on options
Ranges	Up to 100 V and 10 A or 20 A direct inputs, depending on model. With shunts, transducer or clamp accessories – up to 300 A.
Mechanical power	Optional process interface 4 x speed/torque/Pmech
Interfaces	RS-232, optional IEEE 488.2/1, Ethernet, USB
Functions	
RMS values	V/A/P/Q/S and derived values like Fundamental, THD ...
Oscilloscope	Simultaneous display of up to three values on sample level
FFT	Up to H40 or half of sampling rate
Recorder	Display of three average values over time for trend determination
Vector	Display of Fundamental of all channels

For more information and detailed specifications, go to www.fluke.com/pq

Included accessories

Fluke 1735 Logger: Four flexible current probes (15 A/150 A/3000 A), Power Log software, voltage leads and clips, color localization set, PC interface cable, international ac adapter (115/230 V, 50/60 Hz), soft carrying case, printed English manual and multi-language manual CD.

Norma 4000/5000 Analyzers: Test certificate with calibration values, user manual, power supply cable and are completely customizable with a variety of accessories.

Ordering information

Fluke-1735	Three-Phase Power Analyzer
Norma 4000 BU43	High Precision Power Analyzer
Norma 5000 BU56	High Precision Power Analyzer

Industrial
Commercial
Electrical

Fluke 345 Power Quality Clamp Meter

The ideal meter for commissioning and troubleshooting modern electrical loads

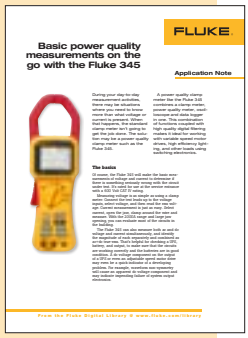
With a bright color display to analyze the harmonic spectrum, a low-pass filter to remove high frequency noise, and a high EMC immunity design, the Fluke 345 is ideal for measurements on switching loads such as variable speed drives, electronic lighting and UPS systems. Additionally, the Hall Effect measurement system makes measurement of dc current possible without the need to break the circuit, and the internal memory enables long-term logging for analysis of trends or intermittent problems.

- **AC/DC current:** Clamp-on measurement of ac peak and dc current up to 2000 A without breaking the circuit
- **Highest safety rating:** 600 V CAT IV/1000 V CAT III rated for use at the service entrance
- **Accurate measurement of parameters:** Even with distorted waveforms present on electronic loads with low-pass filter
- **Data logging:** Identify intermittent faults by logging any power parameters for minutes or months, including harmonics
- **Verify batteries:** Direct measurement of dc ripple (%) for battery and dc systems
- **Troubleshoot harmonics:** Analyze and log harmonics digitally or graphically
- **Inrush current:** Capture and analysis from 3 seconds to 300 seconds
- **Easy-to-use:** Easily confirm instrument setup with large backlit color display of waveforms and trends
- **Three-Phase power:** Built in capability for balanced loads.
- **View graphs and generate reports:** with included Power Log software

Electrical Safety Dual Rated CAT III and CAT IV

Application note, literature code 2722823:

Basic power quality measurements on the go with the Fluke 345



A great introduction to power quality, this short application note teaches the basics of simple voltage, current, waveform, harmonics, power, inrush, and logging measurements using the Fluke 345. Learn how to read waveforms and how and where to use them, and then learn about harmonics and how they distort voltage and current.

Download this and other application notes at **www.fluke.com/library** or sign up for Fluke News to get pertinent information on your industry at **www.fluke.com/subscribe**

LH1050 and LH1060 Power Clamp Meters

Ideal combination of a clamp and power meter

The LH1050/1060 ac/dc meters are essential tools for power measurement and diagnostics on switching loads such as drives and high efficiency lighting. They combine the functionality of a current clamp, power meter and harmonics meter in a single handheld instrument that has been designed to a CAT III 600 V rating. Common applications include:

- Installing and testing of dc power systems
- Measurement of harmonics voltage and current on industrial systems
- Power and energy optimization

LH1050 and LH1060 features:

- Wide range of measuring tasks possible with V, A, Hz, W, VAR, VA and PF in one easy to use clamp
- True-rms ensures correct, accurate measurement of ac+dc and distorted signals
- Clear presentation of results with bargraph for dual display of V/Hz, A/Hz and PF/W
- Flexible applications with three-phase power capability for balanced loads
- Easy data evaluation with 'Smart Hold' saving up to 7 parameters
- Capture trends with record mode storing Min Max and Average values
- EL backlight visible in varying light levels
- Two-year warranty

Electrical Safety 600 V CAT III

Additional LH1060 features:

- Check startup characteristics with measurement of peak voltage and current values
- Harmonic trouble shooting with measurement of Total Harmonic Distortion (THD), Distortion Factor (DF) and Crest Factor (CF)
- Monitor the effects of loads with dc ripple measurement

For more information and detailed specifications, go to www.fluke.com/clamps

Included accessories

Fluke 345 Clamp Meter: Batteries, pair of measuring leads, alligator clips, operating instructions, Power Log software, interface cable pouch, and calibration certificate.

LH1050/LH1060 Clamp Meters: Battery, pair of measuring leads, operating instructions, and pouch.

Recommended accessories

WINLOG S/W	WinLOG software for LH 1050/1060, Analyst 2050/2060

Ordering information

LH1050	AC/DC Power Clamp Meter
LH1060	AC/DC Power Clamp Meter
Fluke-345	AC/DC Power Quality Clamp Meter

The LH1050 and LH1060 are not available in Canada.

Fluke 360 AC Leakage Current Clamp Meter

1 µA resolution leakage current measurements with a tough, pocket sized clamp

Electrical Safety 300 V CAT II

The unique jaw design of the Fluke 360 eliminates the influence of adjacent current conductors and measures leakage current down to 1 µA for monitoring of insulation. The ergonomic design of the Fluke 360 ensures easy measuring. The measuring clamp fits into tight spaces and the wide display angle clearly shows the measurement result. The data hold button keeps the measured value on the display after removing the clamp for the measured conductor.

The light Fluke 360 offers the widest range of current measurement for maintenance professionals and contractors. Use the light and rugged Fluke 360 when it's not possible to power down and break the circuit.

Current measurement

- Automatic ranging within the manually selected mA or A range
- Ranges 3/30 mA and 30/60 A
- Current resolution 1 µA/0.01 mA and 0.01 A/0.1 A
- Frequency range 50 and 60 Hz
- Jaw size: 40 mm (1.55 in) maximum conductor diameter
- Auto power off
- One-year warranty

LH41 AC/DC Low Current Clamp Meter

AC/DC current clamp for low current applications

Electrical Safety 300 V CAT III

The compact size of the LH41 makes it ideal for making general measurements on small conductors. With excellent accuracy and resolution of 1 mA, the LH41 offers exceptional performance for automotive and other low current applications.

Features

- Easy use autoranging ac/dc leakage current measurements from 10 mA to 40 A
- High 1 mA current resolution for quick circuit comparison on sensor and control circuits
- Patented jaw design for high accuracy, low dc current measurement ensures no interference from other circuits
- Push button dc Auto Zero for correct measurement every time
- Battery saving auto power off function
- 'Carry everywhere' pocket size, lightweight design
- Convenient display hold for capturing measurement in inaccessible spots
- CAT III 300 V
- Two-year warranty

For more information and detailed specifications, go to www.fluke.com/clamps

LH2015 AC/DC True-rms Clamp Meter

High current, large jaw clamp for industrial and utility applications

The LH2015's large jaw is suitable for current measurements up to 2000 A ac/dc on large conductors or bus bars. The LH2015's measurement accuracy is unaffected by external magnetic fields or off-center conductor positioning due to its advanced jaw design. Its Display-Hold feature freezes the measurement for viewing after measuring and the Max-Hold captures the maximum measured current.

Current clamp measurement can be used when:

- it's not possible to power down equipment and break the circuit.
- checking the current on large loads to avoid overheating of conductors.
- measuring large dc currents in industrial drives.

Features:

- 2000 ac and dc current measurement
- Accurate true-rms measurement for distorted waveforms
- Large 50 mm (2 in) jaw capacity
- Autoranging and Auto-zero
- Display-Hold and Max-Hold (surge)
- Two-year warranty

Included accessories

Fluke 360 Clamp Meter: Soft carrying pouch and users manual.

LH41 Clamp Meter: Battery and operating instructions.

LH2015 Clamp Meter: Soft case and users manual.

Ordering information

Fluke-360	AC Leakage Current Clamp Meter
LH41	AC and DC Current Clamp Meter
LH2015	AC/DC True-rms Clamp Meter

These products are not available in Canada.

Get more done with the latest Fluke tools

Move up to better design and performance with Fluke clamp meters

It's never been more important to be efficient, fast, and accurate at your job. Today, you need a tool that can keep up with the demanding needs of residential, commercial, and industrial electricians. The Fluke 337 Clamp Meter provides you the ability to work quickly and easily in narrow and dark locations, and makes it possible to keep track of your measurements for further analysis.

The Fluke 337 is a significant improvement from the Fluke 30 Series clamps that were built in the mid 1990's. While the 30 Series was a leader in its day, the 337 offers a design that is compact and lightweight, and functionality that allows you to take measurements that are more precise.

Fluke 330 Series clamps are designed more ergonomically with capabilities not found in their predecessors, the Fluke 30, 31, 32, 33 and 36.

Specialty clamp meters

See page 54 for information on the **NEW!** 902 True-rms HVAC Clamp Meter.

See page 44 for information on the **NEW!** 771 Milliamp Process Clamp Meter.

Function	Fluke 30 Series Clamps	Fluke 337	Benefit
Three-year warranty	Out of warranty	Three-year warranty	Lower cost of ownership
Small body and jaws fit perfectly in your hand and into tight places	–	•	Fits into tight areas for maximum usability
Frequency measurement	–	•	Built-in frequency counter
Meter controls are positioned so current measurements can be done with one hand (index finger on clamp opening lever and thumb on rotary switch)	–	•	Easier to use, efficient measurements
Large, backlit display is easy-to-see	–	•	Use in dark areas
Inrush current function for measuring starting current for motors, lighting, etc.	–	•	Easily measure inrush current on motors, switches, and circuit protectors to determine if equipment can work with high current levels
Improved low current measurement accuracy from new microprocessor technology	–	•	More precise measurements
Min/Max capability	Max only	Min/Max	Easily track your measurements

Fluke 337 Premium Clamp Meter

- Rugged
- CAT III 600 V
- Inrush
- Compact

For more information and detailed specifications, go to www.fluke.com/clamps

Fluke 337 and 322 Clamp Meters

Measure inrush motor starting current the way a circuit breaker sees it

- Inrush current feature (selected models)
- Small body and jaws fit perfectly in your hand and into tight places
- Controls positioned for one hand operation
- Accurate low current measurements
- Backlight available on most models
- Auto shut-off
- Display hold
- Safety rating: IEC 1010-2-031, CAT III 600 V
- Three-year warranty on 330 Series

Fluke 322 Clamp Meter

- Precise measurements with 1.8 % basic accuracy
- Resolution up to 0.01 A and 0.1 V
- Measures ac current 40.00 A/400.0 A
- Measures ac and dc volts to 600 V
- Resistance measurement to 400 Ω
- Continuity for quick checking of shorts

Electrical Safety 600 V CAT III · CE · UL LISTED · CSA · TÜV GS · N10140 · True-rms

Application note, literature code 2041766:

Making accurate inrush current measurements

New high-efficiency motors require better tools to evaluate and fix the consequences of their high inrush current. The Fluke 335, 336 and 337 Clamp Meters are designed to capture inrush current accurately and, most importantly, synchronously and provide readings that accurately depict what the circuit protector experiences.

This application note covers practices to help you accurately and safely measure and interpret inrush current measurements.

Want to read more? Download this and other application notes at **www.fluke.com/library**

Specifications – 320 and 330 Series

Fluke 320 and 330 Series Clamp Meters offer an impressive array of innovative features with current ranges up to 1000 A. Choose the model that matches the jobs you do.

(@23 °C ± 5 °C RH 0 to 90 %)		Fluke 321	Fluke 322	Fluke 333	Fluke 334	Fluke 335	Fluke 336	Fluke 337
AC current	Range	to 400.0 A	40.00 A/ 400.0 A	to 400.0 A	to 600.0 A			to 999.9 A
	Accuracy	1.8 % + 5 counts (50 to 60 Hz)		2 % + 5 counts (50 to 60 Hz)			2 % + 5 counts (10 to 100 Hz)	
	AC response	Averaging				True-rms		
Inrush	Integration time	–	–	–	100 mS			
DC current	Range	–	–	–	–	–	0 to 600.0 A	0 to 999.9 A
	Accuracy	–	–	–	–	–	2 % + 3 counts	
AC volts	Range	400.0 V/600.0 V		to 600.0 V				
	Accuracy	1.2 % + 5 counts (50 to 400 Hz)		1 % + 5 counts (50/60 Hz)			1 % + 5 counts (20 to 100 Hz)	
	AC response	Averaging				True-rms		
DC volts	Range	–	400.0 V/ 600 V	to 600.0 V				
	Accuracy	–	1 % + 5 counts					
Ohms	Range	to 400.0 Ω		to 600.0 Ω	600.0 Ω/6000 Ω			
	Accuracy	1 % + 5 counts		1.5 % + 5 counts				
	Continuity	≤ 30 Ω						
Hz	Range	–	–	–	–	–	–	to 400 Hz
	Accuracy	–	–	–	–	–	–	0.5 % + 5 counts
MIN/MAX		–	–	–	–	–	–	Yes
Backlight		–	–	–	Yes			
Display hold		Yes						
Size	H x W x D	7.5 in x 2.5 in x 1.4 in		9.4 in x 3.1 in x 1.6 in			9.9 in x 3.1 in x 1.6 in	
	Max wire dia.	1 in		1.2 in				
	Weight	8 oz		11 oz				

Models 333, 334, 335, 336 and 337

Operating temperature: -10 °C to 50 °C (-14 °F to 122 °F)
Altitude: 2,500 meters
Battery life: (2) AA alkaline approximately 150 hours continuous, automatic low battery indicator
Safety rating: IEC 1010-2-031, CAT III 600 V
Temperature de-rating: Add 0.1 x specified accuracy for each °C above 28 °C or below 18 °C
Storage temperature: -40 °C to 60 °C (-40 °F to 140 °F)

Models 321 and 322

Operating temperature: -10 °C to 50 °C (-14 °F to 122 °F)
Altitude: 2,000 meters
Battery life: (2) AAA carbon zinc approximately 100 hours continuous, automatic low battery indicator
Safety rating: IEC 1010-2-031, CAT III 600 V
Temperature de-rating: < 18 °C, > 28 °C add 0.1 x specified accuracy /°C
Storage temperature: -30 °C to 60 °C (-22 °F to 140 °F)

See page 54 for information on the NEW! 902 True-rms HVAC Clamp Meter

Recommended accessories – 320 and 330 Series

TL223
SureGrip™ Electrical Test Lead Set
See page 61

H3
Clamp Meter Holster
See page 70

LVD1
Volt Light
See page 64

TL71
Premium Test Lead Set
See page 62

For more information and detailed specifications, go to www.fluke.com/clamps

Included accessories

Soft carrying case, test leads, (2) batteries, instruction card and safety information.

Ordering information

Fluke 321
Fluke 322
Fluke 333
Fluke 334
Fluke 335
Fluke 336
Fluke 337

Fluke 1550B and 1520 MegOhmMeters

Powerful troubleshooting and predictive maintenance tools

The 1550B automatically calculates polarization index and dielectric absorption ratios. The 1550B features:

- Standard test voltages of 250 V, 500 V, 1000 V, 2500 V and 5000 V for a wide range of equipment testing
- Programmable test voltages available in 50-volt steps from 250 V to 1000 V and 100-volt steps from 1000 V to 5000 V
- Automatic calculation of Dielectric Absorption Ratio (DAR) and Polarization Index (PI) with no additional setup
- Easy setup saves time and effort when conducting "timed" and "ramp" test of insulation breakdown
- Improved ramp function (0 V dc to 5000 V dc) for breakdown testing
- Autodischarge of capacitive voltage
- Measures resistances up to one teraohm
- Includes improved FlukeView® Forms Software and Optical Interface cable for easier downloading to a Windows® PC

Specifications – 1550B MegOhmMeter

The meter's accuracy is specified for one year after calibration at operating temperatures of 0 °C to 35 °C. For operating temperatures outside the range (–20 °C to 0 °C and 35 °C to 50 °C), add ± .25 % per °C, except on the 20 % bands add ± 1 % per °C.

Insulation resistance measurement		
Test Voltage (dc)	**Range**	**Accuracy (± reading)**
250 V	200 kΩ to 5 GΩ 5 GΩ to 50 GΩ	5 % 20 %
500 V	200 kΩ to 10 GΩ 10 GΩ to 100 GΩ	5 % 20 %
1000 V	200 kΩ to 20 GΩ 20 GΩ to 200 GΩ	5 % 20 %
2500 V	200 kΩ to 50 GΩ 50 GΩ to 500 GΩ	5 % 20 %
5000 V	200 kΩ to 100 GΩ 100 GΩ to 1 TΩ	5 % 20 %

Function	Range	Accuracy (± reading)
Leakage current	1 nA to 2 mA	± (5 % + 2 nA)
Capacitance measurement	0.01 uF to 15.00 µF	± (15 % rdg + 0.03 µF)
Live circuit indicator	30 V to 600 V ac/dc, 50/60 Hz	± (5 % + 2 V)

Short circuit current: greater than 1 mA and less than 2 mA
Bargraph range: 0 to 1 TΩ
Insulation test voltage accuracy: -0 % to +10 % at 1 mA load current
Induced ac mains current rejection: 2 mA maximum
Charging rate for capacitive load: 5 seconds per µF
Timer: 0 to 99 minutes; settable in 1 minute increments; indicated to within 1 second
Ramp: 0 % to 100 % of selected test voltage, or until breakdown
Dimensions (HxWxL): 330 mm x 242 mm x 170 mm (13 in x 9.5 in x 6.7 in)
Weight (with battery): 4 kg (8.8 lb)
Battery type: 12 V, lead-acid, rechargeable
Charger input (ac): 85 to 250 V ac, 50/60 Hz, 50 VA
Operating temperature: –20 °C to 50 °C (–4 °F to 122 °F)
Storage temperature: –20 °C to 65 °C (–4 °F to 149 °F)
Relative humidity: 80 % at 31 °C decreasing linearly to 50 % at 50 °C
Operating altitude: 0 to 2000 meters
Enclosure sealing: IP 40
Safety conformance: EN 61010-1, CAT III, 600 V, EN61557, Parts 1 & 2
Input overload protection: 600 V ac continuous
Warranty: Two-years
Software: FlukeView® Forms Basic Software requires a PC running Windows® 95, 98, Me, 2000, NT4.0

Recommended accessories – 1550B MegOhmMeter

FVF-UG
FlukeView Forms Software Upgrade
See page 65

TL1550EXT
25 Foot Extension Test Lead Set

L206
Deluxe LED Hat Light
See page 64

Recommended accessories – 1520 MegOhmMeter

TL27
Heavy-Duty Test Lead Set
See page 62

ToolPak™
Meter Hanger
See page 71

SH100
Shoulder harness for 1520

TL223
SureGrip™ Electrical Test Lead Set
See page 61

C43
Soft Carrying Case
See page 70

For more information and detailed specifications, go to www.fluke.com/1550

Fluke 1520 MegOhmMeter

A proven workhorse, the 1520 can make up to 5,000 insulation resistance tests, more than any other Fluke insulation tester, without changing batteries. A dual analog/digital display makes it easy to use. A lo-ohms function measures voltage and checks connections. Thanks to superb accuracy, endurance, and handheld size, the 1520 is a long-standing tool of choice for demanding plant and utilities work.

- Large, backlit LCD with analog bar graph and digital display
- Three output voltages for insulation resistance testing: 250 V, 500 V and 1000 V
- Perform up to 5,000 insulation resistance tests without changing batteries
- Insulation resistance testing up to 4000 MΩ; switches automatically to voltage measurement when voltage is greater than 30 V ac or 30 V dc
- Auto-discharge of capacitive voltage
- AC/DC voltage measurement up to 600 V
- Lo-Ohms function for testing connections
- Last reading memory display

Included accessories

Fluke 1550B MegOhmMeter: Test leads, 5000 V-rated probes, alligator clips, interface adapter and cable, FlukeView Forms software, line cord, soft carrying case, and users manual.

Fluke 1520 MegOhmMeter: TL27 Heavy Duty Test Leads, TP74 Lantern Tip Test Probes, AC285 Large Jaw Alligator Clips, protective holster with hand strap, carrying case with accessory storage, four C-cell alkaline batteries, instruction manual, and instruction manual on CD-ROM.

Ordering information

Fluke-1520 MegOhmMeter
Fluke-1550B MegOhmMeter

Fluke 1587 and 1577 Insulation Multimeters

Two powerful tools in one

The Fluke 1587 and 1577 Insulation Multimeters combine a digital 1 kV insulation tester with a full-featured, true-rms digital multimeter in a single compact, handheld unit, which provides maximum versatility for both troubleshooting and preventative maintenance. Whether you work on motors, generators, cables, or switchgear, the Fluke 1587 and 1577 Insulation Multimeters are ideally suited to help you with your tasks.

- Insulation test (1587: 0.01 MΩ to 2 GΩ) (1577: 0.1 MΩ to 600 MΩ)
- Insulation test voltages (1587: 50 V, 100 V, 250 V, 500 V, 1000 V), (1577: 500 V, 1000 V) for many applications
- 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
- Filter for motor drive measurements (1587 only)
- AC/DC voltage, dc milliVolts, ac/dc milliamps, resistance (Ω), and continuity
- Capacitance, diode test, temperature, Min/Max, and frequency (Hz) (1587 only)
- Auto power off to save battery power
- Large display with backlight and large digits
- Included accessories: Remote probe, test leads and probes, alligator clips, (K-type thermocouple, 1587 only)
- Accepts optional Fluke TPAK™ magnetic hanging system to free your hands for other work
- Rugged, utility hard case allows you to bring everything you need for the job
- Three-year warranty

Specifications

	1587	1577
Insulation test voltages 50 V, 100 V, 250 V, 500 V, 1000 V	•	
Insulation test voltages 500 V, 1000 V		•
Insulation test: 0.01 MΩ to 2.0 GΩ	•	
Insulation test: 0.1 MΩ to 600 MΩ		•
Auto-discharge of capacitive voltage	•	•
Insulation test smoothing reading	•	
Frequency	•	
Capacitance	•	
Diode test	•	
Temperature	•	
Min/Max	•	
Low-pass filter (for work on VSDs)	•	
AC/DC Voltage	•	•
DC Millivolts	•	•
AC/DC milliAmps	•	•
Resistance (0.1 Ω to 50 MΩ)	•	•
Continuity	•	•
Three-year warranty	•	•
Remote probe, test leads, alligator clips	•	•
K-type thermocouple	•	
Rugged, utility hard case	•	•
Auto power off	•	•

Recommended accessories

ToolPak™
Meter Hanger
See page 71

i400s
AC Current Clamp
See page 66

C25
Meter Case
See page 70

For more information and detailed specifications, go to www.fluke.com/1587

Get the most value and productivity from Fluke kits

Establishing a preventive maintenance program is becoming critical to maintaining the uptime of electrical equipment and can significantly reduce both planned and unplanned downtime. Unplanned downtime costs are difficult to calculate, but are often significant. For some industries, it can represent 1 % to 3 % of revenue (potentially 30 % to 40 % of profits) annually.

These kits can help you be proactive and efficient with your maintenance and can save you up to 10 % off the individual price of the tools.

Fluke 1587/ET Advanced Electrical Troubleshooting Kit includes:

- Fluke 1587 Insulation Multimeter
- Fluke i400 Current Clamp
- Fluke 62 Mini Infrared Themometer

Fluke 1587/MDT Advanced Motor and Drive Troubleshooting Kit includes:

- Fluke 1587 Insulation Multimeter
- Fluke i400 Current Clamp
- Fluke 9040 Phase Rotation Indicator

Included accessories

Remote probe, test leads, alligator clips, K-type thermocouple (1587 only), hard case and user documentation.

Ordering information

Fluke-1577	Insulation Multimeter
Fluke-1587	Insulation Multimeter
Fluke-1587/ET	Advanced Electrical Troubleshooting Kit
Fluke-1587/MDT	Advanced Motor and Drive Troubleshooting Kit

Fluke 1507 and 1503 Insulation Testers

Insulation resistance testing in the palm of your hand

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 preventive maintenance applications. Additional features, like the remote probe on these tools save both time and money when performing tests.

Insulation test ranges:

- 1507: 0.01 MΩ to 10 GΩ
- 1503: 0.1 MΩ to 2 GΩ

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 (1507 only)
- 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
- Lo-Ohms/Earth bond continuity (200 mA)
- 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 ToolPak™ 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

Application note, literature code 1579160:

Insulation resistance testing

Insulation resistance testers can be used to determine the integrity of windings or cables in motors, transformers, switchgear, and electrical installations.

The test method is determined by the type of equipment being tested and the reason for testing. For instance, when testing electrical cabling or switchgear (low-capacitance equipment) the time-dependent capacitive leakage and absorption leakage currents become insignificant and decrease to zero almost instantly. A steady conductive leakage current flow is reached almost instantly (a minute or less) providing perfect conditions for the spot-reading/short time resistance test.

Want to read more? Download this and other application notes at **www.fluke.com/library**, or sign up for Fluke News for pertinent information on your industry at **www.fluke.com/subscribe**

Features – 1507 and 1503 Testers

Feature	1507	1503
Insulation test voltages 50 V, 100 V, 250 V, 500 V, 1000 V	•	
Insulation test voltages 500 V and 1000 V		•
Insulation test: 0.01 MΩ to 10 GΩ	•	
Insulation test: 0.01 MΩ to 2 GΩ		•
PI/DAR	•	
Auto discharge of capacitive voltage	•	•
Remote test probe, test leads, alligator clips	•	•
Rugged utility hard case	•	•
Auto power off	•	•

Recommended accessories – 1507 and 1503 Testers

C101
Meter Hard Case
See page 70

ToolPak™
Meter Hanger
See page 71

C25
Meter Case
See page 70

Included accessories

Remote probe, test leads, test probes, alligator clips, holster and user documentation.

Ordering information

Fluke-1507 Insulation Tester
Fluke-1503 Insulation Tester

For more information and detailed specifications, go to www.fluke.com/1507

Pick the right process tool for you

Process Tools Selection Guide

	Loop Calibrator	**Pressure Calibrator**	**Temperature Calibrator**	**Precision Multifunction Process Calibrator**	**Intrinsically Safe Calibrator**	**Documenting Process Calibrator**	**Process mA Clamp Meter**	**ProcessMeter® Test Tool**
Model	**715**	**718**	**724**	**726**	**725Ex**	**744**	**771**	**789**
Measure								
V dc	25 V		30 V	30 V	30 V	300 V		1000 V
V ac (true-rms)						300 V		1000 V
Resistance			3200 Ω	4000 Ω	3200 Ω	11 kΩ		40 MΩ
A dc	24 mA	24 mA	24 mA	24 mA	24 mA	110 mA	20.99, 99.9 mA	30 mA, 1 A
A ac								•
Frequency				15 kHz	10 kHz	50 kHz		20 kHz
Pressure		1 psi, 30 psi, 100 psi and 300 psi		•[1]	•[5]	•[1]		
Temperature: RTDs			7 types	8 types	7 types	8 types		
Temperature: TCs			12 types	13 types	12 types	13 types		
Source/Simulate								
V dc	20 V		10 V	20 V	10 V	15 V		
Resistance			3200 Ω	4000 Ω	3200 Ω	11 kΩ		
mA dc/% scale	24 mA			24 mA	24 mA	22 mA		24 mA
mA source; auto step, auto ramp	•			•	•	•		•
Frequency				15 kHz	10 kHz	50 kHz		
Temperature: RTDs			7 types	8 types	7 types	8 types		
Temperature: TCs			12 types	13 types	12 types	13 types		
Record								
Min/Max		•				•		•
Hold		•				•	•	•
As Found/As Left results						•		
Log data						•		
Upload data to PC						•		
Remote operation				•				•
Features								
24 V loop supply	•	•	•	•	12 V	•		•
Non-contact measurement							•	
Hart communication						•		
Integrated hand pressure pump		•						
Intrinsically safe (ATEX)					•			
Warranty	3 years	1 year	3 years	3 years	1 year	3 years	1 year	3 years
NIST traceable certification	•	•	•	•	•	•		
Accessories[3]	A/B	C	A/B	A/B				A/B
Pressure enabled[4]		•		•	•	•		
See page	**42**	**41**	**40**	**39**	**45**	**38**	**44**	**43**

[1]Fluke 700 Pressure Modules required.
[2]Either the internal sensor or a Fluke 700 Pressure Module may be used.
[3]Accessories: A. Compatible with LockPak B. Compatible with ToolPak C. Accepts hanging straps from ToolPak D. Optional accessories
[4]Fluke Process Calibrators in this guide displaying the Pressure Enabled symbol display readings from the 700 Series Pressure Modules.
[5]Fluke 700PEx Pressure Module required.

Fluke 741B, 743B and 744 Calibrators

For the calibration and troubleshooting of process control instrumentation

FLUKE®

Pressure Enabled

- Calibrate temperature, pressure, voltage, current, resistance and frequency instruments
- Built-in procedures for transmitters, square root transmitters, pressure and temperature switches
- Simultaneously measure and source
- Automatically capture calibration results
- Document procedures and results to meet ISO 9000, EPA, FDA, OSHA, and other government requirements
- Measure/simulate 13 types of thermocouples and eight RTDs
- Store up to 8,000 readings in data logging mode (743B and 744 only)
- Protected against dirt, dust and moisture; unaffected by vibration
- Includes a PC interface (743B and 744 only)
- Operate in English, French, German, Italian and Spanish
- Offer one- and two-year calibration cycles and a three-year warranty (one-year for pressure modules)

744: Get HART-ability

The Fluke 744 offers all of the capabilities of the 743B, plus the ability to calibrate, maintain, and troubleshoot HART instrumentation. Integrated HART communication functions permit you to monitor, control, and calibrate HART instrumentation. It handles fast pulsed instruments such as RTD transmitters and PLCs, with pulses as short as 1 ms.

See **www.fluke.com/744upgrade** for the latest list of HART instruments.

741B: A complete documenting calibrator

The 741B is the economical choice for plants that don't use PCs or that require traditional paper forms. It has storage capacity for a day's calibration and measurement data. When you're back at the shop, recall the data on-screen to fill out calibration forms.

743B: More memory, plus a PC interface and data logging

The 743B has all the capabilities of the 741B plus a PC interface that lets you load procedures, lists, and instructions created with software—or unload data for printing, archiving, and analysis. With its expanded memory, the 743B can hold a full week of calibrations and procedures.

Application note, literature code 1262439:

HART® transmitter calibration

The need for calibration of HART smart transmitters is often misunderstood. What do you calibrate and when? Here is a step-by-step procedure showing how to use the Fluke 744 to perform calibration and digital adjustments of Rosemount 3051 and 3144 transmitters and other HART devices.

WE'VE GOT HART ABILITY

Instrumentation management software

The Fluke 743B and 744 are compatible with Fluke 700SW DPC/TRACK software and with software from Beamex, Cornerstone, Emerson, Honeywell, On Time Support, Prime Technologies, Yokogowa, Intools and Meridium.

For more information, visit **www.fluke.com/software**

Specifications – 741B, 743B and 744

Function	Measure	Sourcing
DC voltage	0.025 % reading + 0.005 % full scale	0.01 % output + 0.005 % full scale
DC current	0.01 % reading + 0.015 % full scale	0.01 % output + 0.015 % full scale
Resistance	0.05 % reading + 50 mΩ	0.01 % output + 40 mΩ
Frequency	0.05 %	0.01 %
Thermocouples	0.3 °C	0.2 °C
RTDs	0.3 °C	0.1 °C
Pressure	To 0.25 % of full scale, per pressure module specifications.	

Summary specifications: best case, midrange, one-year.
Battery life: Typically over eight hours
Internal battery pack: NiCd, 7.2 V, 1700 mAh, NiMH 3500 mAh on 744.
Battery replacement: Via snap-shut door without opening calibrator; no tools required
Weight: 1.4 kg (3 lb 1 oz)
Size (HxWxD): 236 mm x 130 mm x 61 mm (9.3 in x 5.1 in x 2.4 in)

Included accessories

TL224 Industrial Test Leads (2 sets), AC220 Test Clips (2 sets), TP220 Test Probes, BP7217 Battery Pack, BC7217 Battery Charger, instruction manual, NIST Traceable calibration certificate and data, serial port cable (743B and 744 only), DPC/TRACK sample version with free PC communication utility software (743B and 744 only).

Additional 744 accessories

BP7235 NiMH Battery Pack, HART communications cable, HART user's manual and NIST Traceable calibration certificate and data.

Ordering information

Fluke-741B	Documenting Process Calibrator
Fluke-743B	Documenting Process Calibrator
Fluke-744	Documenting Process Calibrator
Fluke-700S	DPC/Track Software

Recommended accessories – 741B, 743B and 744

C789
Meter and Accessory Case
See page 70

Fluke-700PTP
Pneumatic Test Pump
See page 69

Fluke-700Pxx
Pressure Modules
See page 41

80PK-25
SureGrip Piercing Temperature Probe
See page 68

TL220
SureGrip Industrial Test Lead Set
See page 61

For more information and detailed specifications, go to www.fluke.com/740

Fluke 726 and 725 Multi-function Process Calibrators

Step up to unmatched accuracy in process measurement and calibration

New

Fluke 726 Precision Multifunction Process Calibrator

The Fluke 726 Precision Multifunction Process Calibrator is designed specifically for the Process industry with broad workload coverage, calibration power and unsurpassed accuracy in mind. The 726 measures and sources almost all process parameters and can calibrate almost anything. The 726 will also interpret results without the help of a calculator and store measurement data for later analysis.

- Precise measurement and calibration source performance, accuracies of 0.01 %
- Transmitter error% calculation, interpret calibration results without a calculator
- Memory storage for up to 8 calibration results, return stored calibration data from the field for later analysis
- Frequency totalizer and frequency pulse train source mode for enhanced flowmeter testing
- HART mode inserts 250 ohm resistor in mA measure and source for compatibility with HART instrumentation
- Integrated pressure switch test allows you to capture the set, reset and deadband of a switch
- Custom RTD curves, add calibration constants for certified RTD probes for enhanced temperature measurement
- New voltage input protection design for improved reliability
- Three-year warranty

Fluke 725 Multifunction Process Calibrator

Pressure Enabled

- Measure volts, mA, RTDs, thermocouples, frequency and ohms to test sensors and transmitters
- Source/simulate volts, mA, thermocouples, RTDs, frequency, ohms and pressure to calibrate transmitters
- Measure/source pressure using any of 29 Fluke 700Pxx Pressure Modules
- Source mA with simultaneous pressure measurement to conduct valve and I/P tests
- Support flow meter testing with frequency and counts per minute (CPM) functions
- Perform fast linearity tests with auto step and auto ramp features

Intrinsically safe version available **(see page 45)**

Specifications – 726 and 725 Calibrators

Measure and source

Function	Range or type	Resolution	Accuracy	Notes
Voltage	0 to 100 mV 0 to 10 V (source) **0 to 20 V (source)** 0 to 30 V (measure)	0.01 mV 0.01 V 0.01 V 0.01 V	**0.01 %**, 0.02 % Rdg + 2 LSD	Max load, 1 mA
mA	0 to 24	0.001 mA	**0.01 %**, 0.02 % Rdg + 2 LSD	Max load, 1000 Ω
mV (TC terminals)	–10.00 mV to +75.00 mV	.01 mV	**0.01 %**, 0.02 % of range + 1 LSD	
Ohms	15 Ω to 3,200 Ω **5 Ω to 4,000 Ω**	0.01 Ω to 0.1 Ω	0.10 Ω to 1.0 Ω **0.015 %**	
Hz - CPM	2.0 to 1,000 CPM 1 to 1000 Hz 1.0 to 10.0 kHz **10.0 to 15.0 kHz**	0.1 CPM 1 Hz 0.1 kHz **0.1 kHz**	± 0.05 % ± 0.05 % ± 0.25 % **± 0.05 %**	Source; 5 V p-p **1 V to 20 V p-p** squarewave, –0.1 V offset
Loop supply	24 V dc	N/A	10 %	
T/C	J, K, T, E, L, N, U, XK	0.1 °C, 0.1 °F	to 0.7 °C **to 0.2 °C**	
T/C	B, R, S, BP	1 °C, 1 °F	to 1.7 °C **to 1.2 °C**	
RTDs	**Cu (10)**, Ni120 (672) Pt 100, 200, 500, 1000 (385) Pt 100 (3916), Pt 100 (3926)	**0.01 °C,** **0.01 °F** 0.1 °C, 0.1 °F	**to 0.15 °C** to 0.2 °C	

Unique 726 specifications are bolded

General specifications
Storage temperature: –20 °C to 71 °C
Operating temperature: –10 °C to 55 °C
Relative humidity: 90 % (10 °C to 30 °C); 75 % (30 °C to 40 °C); 45 % (40 °C to 50 °C); 35 % (50 °C to 55 °C)
Shock: 1 meter drop test
Safety: CSA C22.2 No. 1010.1:1992
EMC: EN50082-1:1992 and EN55022:1994 Class B
Size (HxWxD): 200 mm x 96 mm x 47 mm (7.9 in x 3.8 in x 1.9 in)
Weight: 650 g (23 oz)
Battery: Four AA alkaline batteries
Battery life: 25 hours typical

Simultaneous function capability	Channel A	Channel B
24.000 mA dc	M	M or S
24.000 mA dc with 24 V loop supply	M	
100.00 mV dc		M or S
30.000 V dc measure	M	
20.000 V dc measure 10.000 V dc source 20.000 V dc source		M or S
15 to 3200 Ohms 5 to 4000 Ohms		M or S
Thermocouple J, K, T, E, R, S, B, M, L, U, N, XK, BP		M or S
RTD Cu 10, Ni120; Pt100 (392); Pt100 (JIS); Pt100, 200, 500, 1000 (385), XK and BP		M or S
Pressure (requires Fluke 700PXX Modules)	M	M used as S
Frequency; 10 kHz; (15 KHz 726)		M or S

M = Measure, S = Source/Simulate

Recommended accessories – 726 and 725 Calibrators

Fluke-700PTP
Pneumatic Test Pump
See page 69

C125
Meter Case
See page 70

ToolPak
Meter Hanging Kit
See page 71

80PK-27
SureGrip Industrial Surface Temperature Probe
See page 68

For more information and detailed specifications, go to www.fluke.com/726

Included accessories

TL75 Test Leads, AC72 Test Clips, one pair of stackable test leads, product overview manual (print) and users manual in 14 languages on CD-ROM.

Ordering information

Fluke-726 Precision Multifunction Process Calibrator
Fluke-725 Multifunction Process Calibrator
Fluke-724 Temperature Calibrator
(also see page 40)

Fluke 712, 714 and 724 Temperature Calibrators

Accurate and rugged, temperature calibration tools

The Fluke 710 Series temperature calibrators deliver outstanding performance, durability and reliability. And with a push-button interface, similar to the multifunction Fluke 740 Series Documenting Process Calibrators, the 710s are easy to use. Each calibrator is EMI tolerant, dust- and splash-resistant, and features a removable battery door for quick battery changes.

Fluke 712 RTD Calibrator

- Compatible with pulsed current transmitters
- Measure temperature from an RTD probe
- Simulate RTD output
- Operates with seven types of RTD
- Measure additional RTDs using Ohms measurement function
- Simulate additional RTDs using Ohms source function
- °F or °C selectable
- 25 % stepping, auto-step and auto-ramp
- Ramp and Step Ramp output functions

Fluke 714 Thermocouple Calibrator

- Measure temperature from TC probes
- Simulate TC output
- Operable with nine types of thermocouples
- Calibrate linear TC transmitter with mV source function
- Selectable °F or °C
- 25 % stepping, auto-step and auto-ramp
- Available as accessories: Fluke 700TC1 and TC2 Thermocouple Mini-plug Kits
- Ramp and Step Ramp output functions

Data Sheet, literature code 1560369:

Temperature calibration

See how Fluke can help you calibrate, troubleshoot and verify the most common temperature devices, faster and easier.

Want to read more? Download this and other application notes at **www.fluke.com/library**

Fluke 724 Temperature Calibrator

- Source/measure TCs, RTDs, volts and ohms
- Measure mA while supplying loop power
- 25 % and 100 % stepping, auto-step and auto ramp

Specifications – 712 and 714 Calibrators

Model	Function	Range	Resolution	Accuracy	Notes
Fluke-712	Measure/simulate RTD	-200 °C to 800 °C (Pt 100-385)	0.1 °C, 0.1 °F	0.2 °C, 0.4 °F (Pt 100-385)	Pt; 100 200 500 1000 (385); Pt 100 (392); Pt 100 (392) JIS; Ni 120 (672)
	Measure/simulate resistance	5 Ω to 4000 Ω	0.1 Ω	0.025 %	
Fluke-714	Measure/simulate thermocouple	-200 °C to 1800 °C, depending on type (K, -200 °C to 1370 °C)	0.1 °C or °F (1 °C or °F; BRS)	0.5 °C, 0.8 °F (Type K)	9 TC types; J K T E R S B per NIST 175 and ITS-90 L U per DIN 43710 and PTS-68
	Measure/simulate mV	-10 mV to 75 mV	0.01 mV	0.015 % +10 µV	

General specifications for all Fluke 712 through 718 calibrators
Maximum voltage: 30 V **Non-operating temperature:** -40 °C to 60 °C **Operating temperature:** -10 °C to 55 °C
Relative humidity: 95 % (10 °C to 30 °C); 75 % (30 °C to 40 °C); 45 % (40 °C to 50 °C); 35 % (50 °C to 55 °C)
Operating altitude: 3,000 m max **Shock:** 1 m drop test **Vibration:** Random, 2 g, 5-500 Hz
Safety: CSA C22.2 No. 1010.1:1992 **EMC:** EN50082-1:1992 and EN55022:1994 Class B
Size/weight (HxWxD) (712-717): 187 mm x 87 mm x 32 mm (7.35 in x 3.41 in x 1.25 in) 330 g (12 oz)
Size/weight (HxWxD) (712-717 with holster): 201 mm x 98 mm x 52 mm (7.93 in x 3.86 in x 2.06 in) 600 g (21 oz)
Size/weight (HxWxD) (718): 210 mm x 83 mm x 62 mm (8.25 in x 3.27 in x 2.44 in) 737 g (26 oz)
Size/weight (HxWxD) (718 with holster): 216 mm x 94 mm x 66 mm (8.50 in x 3.72 in x 2.60 in) 992 g (35 oz)
Power: 9 V battery ANSI/NEDA 1604A or IEC 6LR619V alkaline; two batteries in 718
Battery life: 4 to 20 hours, typical, depending on functions used
Warranty: Three-years (one-year on pressure pump in Fluke 718)

Recommended accessories – 712, 714 and 724 Calibrators

TL75 (712 and 724)
Hard Point Test Lead Set
See page 62

C550
Tool Bag
See page 70

TL220 (712 and 724)
SureGrip Industrial Test Lead Set
See page 61

C25 (712 and 714)
Large Soft Case
See page 70

80PK-24 (714)
SureGrip Air Temperature Probe
See page 68

C101 (724)
Meter Hard Case
See page 70

80PK-3A (714, 724)
Surface Probe
See page 68

ToolPak
Meter Hanging Kit
See page 71

For more information and detailed specifications, go to www.fluke.com/tempcal

Included accessories

Each **71X calibrator** includes: Protective yellow holster with test lead storage, test leads and alligator clips (excluding model 714), single 9 V alkaline battery and instruction sheet (14 languages).

Fluke 724: TL75 Test Leads, AC72 Test Clips, one pair of stackable test leads, product overview manual (print) and users manual in 14 languages on CD-ROM.

Ordering information

Fluke-712 RTD Calibrator
Fluke-714 Themocouple Calibrator
Fluke-724 Temperature Calibrator

Fluke 718 and 717 Pressure Calibrators

Compact, professional, pressure calibration tools

Fluke 718 Pressure Calibrators

New! *1 psi and 300 psi models in addition to the 30 and 100 psi models previously available*

- Compact size, lightweight
- New built-in pressure switch test feature
- Built-in pressure/vacuum hand pump, with vernier and bleed valve
- Pressure and vacuum measurement to 0.05 % of full span, using an internal pressure sensor (dry air only)
- Pressure measurement to 10,000 psi/700 bar using any of 29 Fluke 700Pxx Pressure Modules
- Measure mA with 0.015 % accuracy and 0.001 mA resolution, while providing 24 volt loop power supply
- 1/8 inch NPT female pressure fitting
- Min/Max/Hold functions

Intrinsically safe 718 version available (see page 45)

Fluke 717 Pressure Calibrators

Now with 9 ranges: 1, 30, 100, 300, 500, 1000, 1500, 3000 and 5000 psi

- Measure pressure and vacuum to 0.05 % of full scale with internal 30 or 100 psig sensor
  – 1/8 NPT pressure fitting
  – Compatible with non-corrosive gasses and liquids
- Measure pressure to 10,000 psi/69 mPa using one of 29 Fluke 70Pxx Pressure Modules
- Measure mA with 0.015 % accuracy and 0.001 mA resolution, while providing 24 V loop power
- New built-in pressure switch test feature
- Min/Max/Hold functions

Specifications – 717 and 718 Calibrators

	Range	Resolution	Comment
717-1	+/- 1 psi, 27.5 in H_2O, (-7 - +7 kPa)	+0.0001 psi, 0.0001 kPa, 0.0001 in H_2O	Fluke-718 dry air only and includes on board pump
718-1G			
717-30G	-12 to + 30 psi, (-83 to 207 kPa)	0.001 psi, 0.001 kPa, 0.001 in H_2O	Fluke-718 dry air only and includes on board pump
718-30G			
717-100G	-12 to + 100 psi, (-83 to 690 kPa)	0.01 psi, 0.01 kPa, 0.01 in H_2O	Fluke-718 dry air only and includes on board pump
718-100G			
717-300G	-12 to +300 psi, (-83 to +2070 kPa)	0.01 psi, 0.01 kPa, 0.01 in H_2O	Fluke-718 dry air only and includes on board pump
718-300G			
717-500G	0-500 psi, 0-3450 kPa	0.01 psi, 0.1 kPa	Compatible with non-corrosive gases and fluids
717-1000G	0-1000 psi, 0-6900 kPa	0.01 psi, 0.1 kPa	Compatible with non-corrosive gases and fluids
717-1500G	0-1500 psi, 0-10342 kPa	0.1 psi, 1 kPa	Compatible with non-corrosive gases and fluids
717-3000G	0-3000 psi, 0-20700 kPa	0.1 psi, 1 kPa	Compatible with non-corrosive gases and fluids
717-5000G	0-5000 psi, 0-34500 kPa	0.1 psi, 1 kPa	Compatible with non-corrosive gases and fluids
Pressure accuracy	0.05 % of range		
mA measurement	0-24 mA range	0.001 mA resolution	Accuracy: ± 0.015 % + 1 count
Loop power	24 V dc		Accuracy: ± 10 %

Recommended accessories – 717 and 718 Calibrators

700ILF
In-Line Filter
See page 69

700LTP
Low Pressure Test Pump
See page 69

TL220
SureGrip Industrial Test Lead Set
See page 61

C25 (717 only)
Large Soft Case
See page 70

700HTP
Hydraulic Test Pump
See page 69

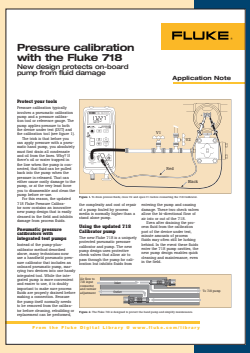
For more information and detailed specifications, go to www.fluke.com/pressure

FLUKE ®

Pressure Enabled

Application note, literature code 2577485:

Pressure calibration with the Fluke 718



New design protects on-board pump from fluid damage. This application note explains how to drain pressure lines safely before calibration, and how to clean the pressure pump on the new Fluke 718.

Want to read more? Download this and other application notes at **www.fluke.com/library**

Fluke 700 Series Pressure Modules

Pressure Enabled

Fluke Process Calibrators in this catalog displaying the Pressure Enabled symbol display readings from the 700 Series Pressure Modules.

- 29 pressure modules
- 8 intrinsically safe pressure modules*
- Ranges from 1.000 in H_2O (0.2491 kPa) to 10,000 psi (68.948 MPa)
- Gage, differential, dual (compound), absolute, and vacuum modules
- Rugged cases protect the modules from harsh environments
- Full-accuracy performance from 0 °C to 50 °C
- Pressure readings update twice per second, and may be displayed in up to 11 different units
- One-year warranty

*for use with 718Ex and 725Ex only (see page 45 for more information)

Included accessories

Fluke 718 and 717: Protective yellow holster, test leads and alligator clips, single 9 V alkaline battery (two 9 V batteries in 718) and instructions.

Ordering information

Fluke-718 30US	Pressure Calibrator
Fluke-718 100US	Pressure Calibrator
Fluke-718 1G	Pressure Calibrator
Fluke-718 300G	Pressure Calibrator
Fluke-717 30G	Pressure Calibrator
Fluke-717 100G	Pressure Calibrator
Fluke-717 1G	Pressure Calibrator
Fluke-717 300G	Pressure Calibrator
Fluke-717 500G	Pressure Calibrator
Fluke-717 1000G	Pressure Calibrator
Fluke-717 1500G	Pressure Calibrator
Fluke-717 3000G	Pressure Calibrator
Fluke-717 5000G	Pressure Calibrator

Fluke 715, 707 and 705 Loop Calibrators

Complete family of volt/mA calibrators

Fluke 707 and 705

Two powerful models to choose from

- Innovative output adjustment dial on 707 provides 1 µA and 100 µA resolution and **one-hand operation**
- Large display and simple interface for ease of use
- Simultaneous mA and % readout for quick, easy interpretation of readings
- mA accuracy of 0.015 % on the Fluke 707 and 0.02 % on the 705
- HART™ mode on 707 connects 250 ohm resistor in series with 24 V loop for compatibility with HART communicators
- Push button 25 % steps for fast, easy linearity checks
- "Span Check" for fast confirmation of zero and span
- Selectable slow and fast linear step ramp provide ramping outputs for valve slewing, remote testing and loop functional tests
- 24 V internal loop supply, so you can power and read a transmitter at the same time without carrying a DMM
- 0 mA to 20 mA or 4 mA to 20 mA default start up modes

Intrinsically safe 707 version available (see page 45)

Application note, literature code 1989137:

Troubleshooting process loops

In process systems, problems with the loop can bring things to a screeching halt. In this application note, find out how to use Fluke test tools to identify current loop prolems such as noise, ripple and drift.

Fluke 715 Volt/mA Calibrator

- Source voltage to 200 mV or 20 V
- Measure loop current (0 to 20 mA, 4 to 20 mA) signals with 0.01 % accuracy and 1 µA resolution
- Measure voltage output process signals from PLCs, transmitters
- Source or simulate 24 mA loop current
- 24 V loop supply with simultaneous current measurement
- Ramp and Step Ramp output functions

Specifications – 715, 707 and 705

Functions	Fluke 705 and 707	Fluke 715	
Voltage measurement			
Range	0 to 28 V	0 to 200 mV	0 to 25 V
Resolution	1 mV	10 µV	1 mV
Accuracy	705: 0.025 % Rdg + 1 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD	0.01 % Rdg + 2 LSD	
Current measurement			
Range	0 to 24 mA	0 to 24 mA	
Resolution	0.001 mA	0.001 mA	
Accuracy	705: 0.02 % Rdg + 2 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD	0.01 % + 2 LSD	
Current sourcing			
Range	0 to 20 mA or 4 to 20 mA[1]	0 to 20 mA or 4 to 20 mA[1]	
Accuracy	705: 0.025 % Rdg + 2 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD	0.01 % Rdg + 2 LSD	
Drive capability	705: 1000 Ω @ 24 mA 707: 1200 Ω @ 24 mA 707Ex: 700 Ω @ 20 mA	1000 Ω @ 24 mA	
Loop power while measuring mA	24 V	24 V	
Voltage sourcing	N/A	0 to 200 mV or 0 to 20 V	
Display current and % of span	Yes	mA or %	
Auto step, auto ramp	Yes	Yes	
Span Check	Yes	Yes	
Battery life	18 hours typical, at 12 mA	18 hours typical, at 12 mA	

[1]Will over-range to 24 mA

Recommended accessories – 715, 707, 707Ex and 705 Calibrators

TL28A
Heavy Duty Test Lead Set
See page 62

TL220
SureGrip Industrial Test Lead Set
See page 61

C25
Large Soft Case
See page 70

C550
Tool Bag
See page 70

PV350
Pressure Vacuum Module
See page 65

Included accessories

Fluke 715: Protective yellow holster, test leads and alligator clips, single 9 V alkaline battery and instruction sheet (14 languages).

Fluke 705, 707 and 707Ex: Protective holster, TL75 Test Leads, AC72 Test Clips and instruction sheet (14 languages).

Ordering information

Fluke-715	Volt/mA Calibrator
Fluke-707	Loop Calibrator
Fluke-707Ex	IS Loop Calibrator
Fluke-705	Loop Calibrator

For more information and detailed specifications, go to www.fluke.com/loop

Fluke 789 and 787 ProcessMeter™ Test Tools

Safety rated multimeters with mA source

True-rms

Fluke 789 ProcessMeter

With the Fluke 789 ProcessMeter, process technicians can do a lot more while carrying a lot less.

Key Fluke 789 features:

- 24 V loop power supply
- HART mode setting with loop power (adds 250 ohm resistor)
- Double-sized, dual display
- 20 mA drive into 1200 ohms
- Backlight with two brightness settings
- 0 to 100 % mA Span Check buttons to toggle between 4 mA and 20 mA
- Infrared I/O serial port compatible with FlukeView® Forms Software
- Improved battery power with four AA batteries
- Plus all the proven 787 features

Fluke 787 ProcessMeter

- Simultaneous mA and % of scale readout on mA output
- 25 % Manual Step plus Auto Step and Auto Ramp on mA output
- Min/Max/Average/Hold/Relative modes
- Externally accessible battery for easy changes

Designed and Conforms to IEC 1010-1 1000V CAT III
Designed and Conforms to IEC 1010-1 600V CAT IV
(Fluke 789 only)

Application note, literature code 2041342:

In-field valve positioner checks

Valve positioners open and close with a 4 to 20 mA signal applied. This application note explains how to adjust these valves so they open and close correctly.

Want to read more? Download this and other application notes at **www.fluke.com/library**

True-rms

Specifications – 789 and 787 ProcessMeter

Measurement function	Best accuracy range and resolution	(% of reading + LSD)	
V dc	400.0 mV, 4.000 V, 40.00 V, 400.0 V, 1000 V	0.1 % + 1	
V dc (true-rms)	400.0 mV, 4.000 V, 40.00 V, 400.0 V, 1000 V	0.7 % + 2	
mA dc	30.000 mA	.05 % + 2	
A dc	1.000 A (0.440 A continuous)	0.2 % + 2	
A ac	1.000 A (0.440 A continuous)	1 % + 2	
Resistance	400.0 Ω, 4.000 k, 40.00 k, 400.0 k, 4.0 M, 40 M	0.2 % + 1	
Frequency (0.5 Hz to 20 kHz)	199.99 Hz, 1999.9 Hz, 19.999 kHz	.005 % + 1	
Diode Test	789: 2.000 V (shows diode voltage drop) 787: 2.400 V (shows diode voltage drop)	2 % + 1 2 % + 1	
Continuity	Beeps for resistance < approx. 100 ohms		
Output function	**Range and resolution**	**Drive capability**	**Accuracy (% of span)**
DC current output (Internal battery operation)	0.000 mA to 20.000 mA or 4.000 mA to 20.000 mA (selectable at power-up) Over-range to 24.000 mA	789: 24 V compliance or, 1,200 Ohms, @ 20 mA 787: 12 V compliance or, 500 Ohms, @ 20 mA	.05 %
DC current simulate (Ext. 24 Volt loop supply, up to 48 V on 789 only)	0.000 mA to 20.000 mA or 4.000 mA to 20.000 mA, (selectable at power-up) Over-range to 24.000 mA	1000 Ohms, @ 20 mA	.05 %
24 V loop supply	789: Minimum 24 V 787: not available	250 Ohms @ 20 mA	> 24 V
Current adjustment modes	Manual: Coarse, Fine, 25 % and 100 % step (100 % step 789 only) Automatic: slow ramp, fast ramp, 25 % step		

Temperature range of 18 °C to 28 °C, for one year after calibration

Maximum voltage applied between any jack and earth ground: 1000 V rms **Storage temperature:** -40 °C to 60 °C
Operating temperature: -20 °C to 55 °C **Relative humidity:** 95 % up to 30 °C; 75 % up to 40 °C; 45 % up to 50 °C; 35 % up to 55 °C
Safety: Designed in accordance with EN61010, ANSI/ISA S82.01-1994 and CAN/CSA C22.2 No. 1010.1-92 Over-voltage CAT III
Size (HxWxL)/weight (787 with holster): 52 mm x 98 mm x 201 mm (2.06 in x 3.86 in x 7.93 in)/638 g (1.4 lb)
Size (HxWxL)/weight (789): 50 mm x 100 mm x 203 mm (1.97 in x 3.94 in x 8.00 in)/600 g (1.3 lb)

Recommended accessories – 787 and 789 ProcessMeter

TL220
SureGrip Industrial Test Lead Set
See page 61

ToolPak
Meter Hanging Kit
See page 71

80T-150U
Universal Temperature Probe
See page 69

C125
Meter Case
See page 70

PV350
Pressure Vacuum Module
See page 65

For more information and detailed specifications, go to www.fluke.com/processmeters

Included accessories

Fluke-789 ProcessMeter: TL71 Premium Safety-Designed Test Lead Set plus alligator clips, 4 AA alkaline batteries (installed), product overview and users manual (CD-ROM) in 14 languages.

Fluke-787 ProcessMeter: Protective yellow holster with test lead storage, TL75 Safety-Designed Test Lead Set plus alligator clips, one 9 V alkaline battery (installed), product overview and users manual (CD-ROM) in 14 languages.

Ordering information

Fluke-789 ProcessMeter
Fluke-787 ProcessMeter

Fluke 771 Milliamp Process Clamp Meter

Save time and money troubleshooting process control loops

The innovative new Fluke 771 mA Process Clamp Meter is designed to measure, test, and troubleshoot 4–20 mA control signals without breaking the mA loop. Make mA measurements in active control systems without disrupting process control.

Features:

- Best in class 0.2 % accuracy
- Resolution and sensitivity to 0.01 mA
- Hold function captures and displays changing measurements
- Dual display with both mA measurement and 0 % to 100 % of 4 mA to 20 mA span
- Measurement spotlight illumination hard to see wires in dark enclosures
- Detachable clamp with extension cable for measurements in tight locations
- Includes carrying case that can be used as a belt mounted holster

Key uses:

- Measure mA signals for PLC and control system analog I/O
- Measure 4 mA to 20 mA output signals from transmitters
- Measure 10 mA to 50 mA signals in older control systems using the 99.9 mA range

300 V CAT II

N10140

Range	Resolution	Accuracy	Features	Notes
-20.99 mA to +20.99 mA	0.01 mA	0.2 % or reading + 5 counts	Zero, Hold, backlight, measurement spotlight	Use for measuring and troubleshooting 4 mA to 20 mA signals
-21.0 mA to -99.9 mA +21.0 mA to +99.9 mA	0.1 mA	1 % reading + 5 counts	Zero, Hold, backlight, measurement spotlight	Use for measuring and troubleshooting 10 mA to 50 mA signals

For more information and detailed specifications, go to www.fluke.com/processmeters

Detachable clamp used to measure 4 mA to 20 mA signals on transmitters without breaking the loop.

Fluke 771 included accessories

Carrying case, and instruction manual.

Ordering information

Fluke-771	Milliamp Process Clamp Meter

9102S and 9100S ordering information

9100S-A-156	Dry-Well, Block A [1]
9100S-A-256	Dry-Well, Block A [2]
9100S-B-156	Dry-Well, Block B [1]
9100S-B-256	Dry-Well, Block B [2]
9100S-D-156	Dry-Well, Block D [1]
9100S-D-256	Dry-Well, Block D [2]
9300	Rugged Carrying Case, 9100
9102S-156	Dry-Well, -10 to 122 (2 Wells) [1] [3]
9102S-256	Dry-Well, -10 to 122 (2 Wells) [2] [3]
9320-156	Battery Pack, 9102 [1]
9320-256	Battery Pack, 9102 [2]

9102S and 9009 inserts

3102-1	Insert, AL 1/16 in (1.6 mm)
3102-2	Insert, AL 1/8 in (3.2 mm)
3102-3	Insert, AL 3/16 in (4.8 mm)
3102-4	Insert, AL 1/4 in (6.4 mm) (Standard)
3102-6	Insert, AL 3/8 in (9.5 mm) (Standard)
3102-7	Insert, AL 7/16 in (11.1 mm) (Standard)
3102-8	Insert, AL 5/32 in (4 mm) (Standard)
9308	Hard Carrying Case, 9102/9132

[1] 156 Blocks are 115 V 50/60 Hz
[2] 256 Blocks are 220 V 50/60 Hz
[3] Specify two 3102 inserts

9102S and 9100S Handheld Drywell Temperature Calibrators

Fluke Corporation, Hart Scientific Division

The smallest, lightest and most portable dry-wells in the world

- 9100 model weighs only 2 pounds, 3 ounces (1 kilogram)
- Temperature ranges from -10 °C to 375 °C
- Stability during calibrations to ± 0.05 °C
- Fast and easy calibrations of RTDs and thermocouples
- Includes RS-232 interface, instrument control software
- Direct interface to the Fluke 744

	9100S	9102S
Range	35 °C to 375 °C (95 °F to 707 °F)	-10 °C to 122 °C (14 °F to 252 °F) at 23 °C ambient
Accuracy	± 0.5 °C	± 0.25 °C
Stability	± 0.1 °C at 100 °C ± 0.3 °C at 375 °C	± 0.05 °C at 0 °C
Well-to-well uniformity	± 0.2 °C with sensors of similar size at equal depths within wells	
Stabilization	5 minutes	7 minutes
Well depth	102 mm (4 in); 1.6 mm (1/16 in) hole is 89 mm (3.5 in) deep	102 mm (4 in)
Removable inserts	N/A	1/4 in, 3/16 in (Standard) 1/16 in, 1/8 in, 3/8 in (optional)
Power	115 V ac (± 10 %), 1.5 A or 230 V ac (± 10 %, 0.8 A, specify, 50/60 Hz, 175 W	94 V ac to 234 V ac (± 10 %), 50/60 Hz, 60 W; or 12 V dc
Size (H x W x D)	57 mm x 125 mm x 150 mm (2.25 in x 4.9 in x 5.9 in)	99 mm x 140 mm x 175 mm (3.9 in x 5.5 in x 6.9 in)
Weight	1 kg (2 lb, 3 oz)	1.8 kg (4 lb)
NIST-traceable calibration	Data at 50 °C, 150 °C, 200 °C, 250 °C, 300 °C and 350 °C	Data at -10 °C, 24 °C, 50 °C, 55 °C, 100 °C and 122 °C

Intrinsically Safe Products

Calibrators, thermometers and multimeters designed to intrinsic safety standards

What is "Intrinsically Safe"?

Intrinsic safety is a protection method employed in potentially explosive atmospheres. Devices that are certified as "intrinsically safe" are designed to be unable to release sufficient energy, by either thermal or electrical means, to cause ignition of flammable material (gas or dust/particulates).

There are no global intrinsically safe standards or certifications, but there are organizations that influence directives in certain world geographies.

Factory Mutual

In The United States, Factory Mutual Research, managed by Factory Mutual (FM) Global, is a not-for-profit scientific and testing organization that has tested and certified over 40,000 products in the last 165 years. FM Research has set certification guidelines for equipment used in potentially explosive atmospheres.

Canadian Standards Association (CSA)

Accreditation body for North American regulations based in Toronto, Canada.

ATEX

The primary intrinsically safe standard which has been set in the European Union with the Directive 94/9/EC, commonly called ATEX ("Atmosphères Explosibles,") French for explosive atmospheres.

For more information and detailed specifications, turn to the corresponding non-intrinsically safe product pages (Fluke 707, 718, 725, 574, 68) or go to **www.fluke.com/ex**

Fluke products	ATEX certified	North American Certification	For additional product detail
87V Ex: Intrinsically Safe True-rms Multimeter	II 2 G EEx ia IIC T4		See page 14
707Ex: Intrinsically Safe mA Calibrator	II 2 G EEx ia IIC T4	FM APPROVED N.I. Class I, Div 2, Groups A-D T4	See page 42
718Ex: Intrinsically Safe Pressure Calibrator	II 1 G EEx ia IIC T4	LR 110460 I.S. Class I, Div 1, Groups A-D T4	See page 41
725Ex: Intrinsically Safe Multifunction Calibrator	II 1 G EEx ia IIB 171 °C	LR 110460 I.S. Class I, Div 1, Groups B-D, 171 °C	See page 39
700PEx: Intrinsically Safe Pressure Modules	II 1 G EEx ia IIC T4	221839 I.S. Class I, Div 1, Groups A-D T4	See page 41
Fluke 574-NI Nonincendive Infrared Thermometer		FM APPROVED Class I, Division 2, Groups A, B, C, D; Class I, Zone 2 IIC	See page 51
Fluke 68IS Intrinsically Safe Infrared Thermometer		FM APPROVED Class I, Division 1, Groups A, B, C, D Class I, Zone 0 AEx ia IIC	See page 53

For more information and detailed specifications, turn to the corresponding non-intrinsically safe product pages (Fluke 87V, 707, 718, 725, 574, 68) or go to www.fluke.com/ex.

Application note, literature code 2096400:

Making sense of intrinsic safety and intrinsically safe tools

Want to know what industries Intrinsically Safe products are designed for? Want to know why intrinsic safety is so important? Want to make sense of the product ratings and classifications?

Go to **www.fluke.com/ex**

Fluke 68IS Intrinsically Safe Infrared Thermometer

- Laser guided sighting system for easy targeting with 1 % accuracy
- 12-point data logging
- Advanced optics to measure smaller targets at greater distances
- Adjustable emissivity for more accurate temperature measurements
- Selectable MAX, MIN, DIF and AVG functions that display values instantly with Hi/Lo Alarm
- Expanded measurement range up to 760 °C (1400 °F)
- RTD probe accessory included for dual contact and non-contact temperature measurements
- Class I, Division 1, Groups A, B, C, D Class I, Zone 0, AEx ia IIC, T4 at 50 °C when used with 9 V alkaline battery

Not available for purchase in Europe.

Ordering information

Fluke-87V Ex	IS True-rms Multimeter
Fluke-707Ex	IS Loop Calibrator
Fluke-718Ex	IS Pressure Calibrator
Fluke-725Ex	IS Multifuction Process Calibrator
Fluke-700PEx	Pressure Modules (700P01Ex, 700P05Ex, 700P06Ex, 700P09Ex, 700P24Ex, 700P27Ex, 700P29Ex and 700PA4Ex)
Fluke-574-NI	Precision Infrared Thermometer w/ Logging SW Nonincendive
Fluke-68IS	Infrared Thermometer Intrinsically Safe

Ti40 and Ti50 Series IR FlexCam® Thermal Imagers

The thermal imagers for professionals demanding the best

Fluke Ti40, Ti45, Ti50, Ti55

New

Fluke Ti40FT, Ti45FT, Ti50FT, Ti55FT

FIND problems faster with Fluke thermal imagers.
Reduce costs and maximize uptime with our complete range of imaging solutions. They combine the largest, sharpest images in the industry with innovative, easy-to-use features. Fluke Ti40 and Ti50 Series reveal more with IR Fusion® Technology—merging infrared and visible light images in one display. Fluke puts powerful technology within your reach.

Application note, literature code 2764017:

Thermography at Ford's Dearborn Stamping Plant

The Dearborn Stamping Plant has had thermal cameras on site in the past, but has not met the objectives of a successful thermography program. Today, DSP's thermography program is a model for the rest of Ford, and the program came on line in a matter of weeks.

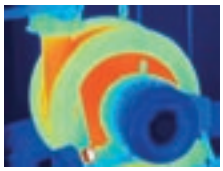
Want to read more? Download this and other application notes at **www.fluke.com/library**

Features – Ti40 and Ti50 Series Imagers

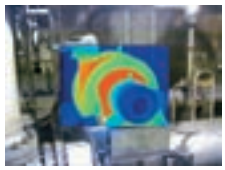
Features	Ti40	Ti45	Ti50	Ti55
180° articulating flexible lens to view images in every situation	•	•	•	•
Choice of 3 interchangeable lenses to cover every application	•	•	•	•
Large 5" high contrast color LCD for a clear picture independent of lighting conditions	•	•	•	•
Fully radiometric for detailed temperature analysis and tracking	•	•	•	•
SmartFocus for best image quality and accurate temperature measurements	•	•	•	•
Windows® CE based menu structure for ease of use	•	•	•	•
Personalized instrument set-up for multiple use	•	•	•	•
CompactFlash memory cards to store over 1000 IR images plus fully radiometric temperature data	•	•	•	•
SmartView reporting and analysis software included	•	•	•	•
AutoCapture for making intermittent problems visible		•		•
On-board analysis functions		•		•
User defined text annotations for simplified reporting		•		•
Built-in visible light (digital) camera	FT model	FT model	FT model	FT model
IR-Fusion blending thermal and visible light images to easily pinpoint suspect components	FT model Picture-in-picture only	FT model	FT model	FT model
IR/Visible Alarm		FT model	FT model	FT model
Laser pointer for easy targeting	FT model	FT model	FT model	FT model
Flash and torch light for high quality images in dark environments	FT model	FT model	FT model	FT model

IR-Fusion™ Technology

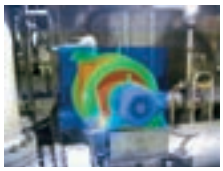
IR-Fusion technology simultaneously captures pixel-for-pixel infrared and visible light images and allows full image optimization with 5 different on-camera as well as software viewing modes. With the integrated laser pointer visible on the images, precise and accurate (faulty) component identification is very easy.



Full IR



Picture-in-Picture



Alpha Blending

IR/Visible Alarm

Full Visible Light

Complete package
The IR FlexCam thermal imagers are delivered as a complete package.

To find the best thermal imaging solution for your application go to our Thermal Imaging Web Selection Guide at **www.fluke.com/thermal_imaging**

Ti40 and Ti50 Series IR FlexCam® Thermal Imagers

The thermal imagers for professionals demanding the best

Specifications – Ti40 and Ti50 Series

	Fluke Ti40	Fluke Ti45	Fluke Ti50	Fluke Ti55
Thermal imaging performance				
Field of view (FOV)*	23° horizontal x 17° vertical			
Spatial resolution (IFOV)*	2.60 mrad		1.30 mrad	
Min focus distance*	0.15 m			
Thermal sensitivity (NETD) at 30 °C	≤0.09 °C	≤0.08 °C	≤0.07 °C	≤0.05 °C
Detector data acquisition/image frequency	30 Hz/30 Hz		60 Hz/60 Hz	
Focus	SmartFocus; single finger continuous focus			
IR digital zoom		2x	2x	2x, 4x. 8x
Detector size	160 x 120		320 x 240	
Detector type	Focal Plane Array, Vanadium Oxide (VOx) Uncooled Microbolometer			
Spectral band	8 µm to 14 µm			
Visual Imaging performance (Fusion models only)				
On-camera operating modes				
Picture-in-Picture	•	•	•	•
Full thermal, full visual light or merged thermal-visual images	Smartview only	•	•	•
Visible light camera	1280 x 1024 pixels, full color (1.3 megapixels)			
Visible light digital zoom		2x	2x	2x, 4x
Visible color alarm above and below		•	•	•
Temperature measurement				
Calibrated temperature range	-20 °C to 350 °C	-20 °C to 600 °C	-20 °C to 350 °C	-20 °C to 600 °C
1200 °C High temperature option		•		
Accuracy	± 2 °C or 2 % (whichever is greater)			
Measurement modes				
Centerpoint, center box (area min/max, average)	•	•	•	•
Moveable spots/boxes		•		•
Isotherms, automatic hot and cold point detection		•		•
Emissivity correction	0.1 to 1.0 (0.01 increments)			
Image presentation				
Digital display	5" large high-resolution backlight LCD			
Video output	RS170 EIA/NTSC or CCIR/PAL composite video			
Palettes	Grayscale, grayscale inverted, blue red, high contrast, hot metal, ironbow, amber, amber inverted			
Optional lenses				
54 mm Telephoto lens	High precision Germanium lens			
Field of view (FOV)	9° horizontal x 6° vertical			
Spatial resolution (IFOV)	0.94 mrad		0.47 mrad	
Min focus distance	0.6 m			
10.5 mm wide angle lens	High precision Germanium lens			
Field of view (FOV)	42° horizontal x 32° vertical			
Spatial resolution (IFOV)	4.9 mrad		2.45 mrad	
Min focus distance	0.3 m			
Image and data storage				
Storage medium	Compact flash card (512Mb) stores over 1000 IR images			
File formats supported	14 bit measurement data included. Images: bmp, gif, jpg, png, tiff; Data formats: comma separated (csv), tab separated (txt)			
Interfaces and software				
Interface	Compact flash card reader included			
Included software	SmartView; Full analysis and reporting software			
Laser (IR-Fusion models only)				
Classification	Class II			
Laser targeting	Laser dot visible on blended and visual image			
Controls and adjustments				
Set-up controls	Date/time, °C/°F, language, scale, LCD intensity			
Image controls	Level, span, auto adjust (continuous/manual)			
On-screen indicators	Battery status, emissivity, background temperature and real time clock			

Battery life: 3 hours continuous operation (2 hours on FT models)
Water and dust resistant: IP54
Size (HxWxD): 162 mm x 262 mm x 101 mm (6.378 in x 10.315 in x 3.9764 in)
Weight: 1.85 kg (4.07 lb)
Two-year warranty

Recommended accessories – Ti40 and Ti50 Series Imagers

103232
Anti-glare Hood

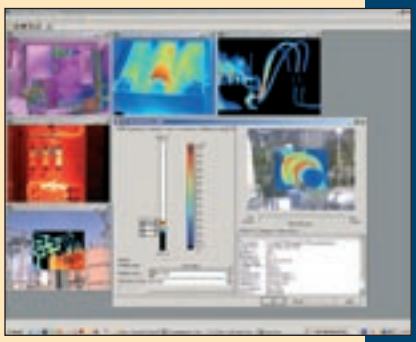
104543
Car Charger

Ti-SBC
Battery Charger

Ti-SBP
Rechargeable Battery Pack

Fluke SmartView™ IR analysis and reporting software for Fluke IR cameras.

Included with each Fluke IR thermal imager, Fluke SmartView software is a modular suite of tools that annotates, views, edits and analyzes IR images. It also generates fully customizable and professional-looking reports in a few easy steps. The IR-Fusion technology is full supported. The software is easy to use for the technician, yet delivers the performance specialized thermographers require for advanced analysis.



Included accessories

AC adapter (for Ti45 and Ti55 only), video cable, 512 MB compact flash card, compact flash card reader and USB cable, PCMCIA compact flash card adapter, SmartView reporting and analysis software on CD, 2 rechargeable battery packs, battery charger, neck strap, heavy duty carrying case and user manual on CD.

Ordering information

Fluke-Ti40-20	IR FlexCam Thermal Imager
Fluke-Ti40FT-20	IR FlexCam Thermal Imager with IR-Fusion
Fluke-Ti45-20	IR FlexCam Thermal Imager
Fluke-Ti45FT-20	IR FlexCam Thermal Imager with IR-Fusion
Fluke-Ti50-20	IR FlexCam Thermal Imager
Fluke-Ti50FT-20	IR FlexCam Thermal Imager with IR-Fusion
Fluke-Ti55-20	IR FlexCam Thermal Imager
Fluke-Ti55FT-20	IR FlexCam Thermal Imager with IR-Fusion

***For ordering information of optional lenses check the Fluke web.**

Fluke Ti20 Thermal Imager

Everything needed for everyday imaging

The Fluke Ti20 Thermal Imager is an unbeatable solution for predictive maintenance and troubleshooting.

- **Complete imaging solution.** The Ti20 Thermal Imager is packaged with all necessary accessories including unlimited-use InsideIR™ companion software and professional training materials.
- **Lowest cost of ownership.** An exceptional value for a high performance imager, the Ti20 also offers affordable instrument service and calibrations.
- **Designed for industrial use.** Rugged Fluke construction; IP54-rated for use in dust and moisture filled environments.
- **Fast and easy inspection routing.** Plan your equipment inspection route, load it once into the imager, and then follow the easy, on-camera instructions each time you perform inspections (simply point, focus and pull the trigger).

Specifications – Ti20 Thermal Imager

Detector	
Detector type	128 x 96 thermal element focal plane array (FPA) uncooled microbolometer
NETD (thermal sensitivity)	≤ 0.2 °C at 30 °C
Thermal	
Temperature range	-10 °C to 350 °C (14 °F to 662 °F)
Accuracy	± 2 °C or 2 % (whichever is greater)
Optical	
Field of View (FOV)	20° horizontal by 15° vertical
Optical resolution (D:S)	75:1 or better
Target sighting	Single laser dot (Meets IEC Class 2 and FDA Class II requirements)
Controls and adjustments	
Focus	Manual
Minimum focus distance	0.15 m (6 in)
Temperature scale	°C or °F selectable
Palettes	Grayscale, reverse grayscale, rainbow, ironbow
Measurement modes	Auto and manual
LCD backlight	On/off selectable
Adjustable emissivity	0.10 to 1.00 in 0.01 increments
Adjustable reflected background temperature	-50 °C to 460 °C (-58 °F to 860 °F)
Environmental	
Ambient operating temperature	0 °C to 50 °C (32 °F to 122 °F)
Relative humidity	10 % to 95 % non-condensing
Storage temperature	-25 °C to 70 °C (-13 °F to 158 °F)
Water and dust resistant	IP54
Other	
Display	Large color LCD
Storage capacity	50 images stored internally
Power	Rechargeable battery pack or six AA batteries
Battery life	Three hours continuous use
Image frame rate	30 Hz*, 9 Hz
Thermal analysis software	InsideIR™ (included) full-featured analysis and reporting software (unlimited use; no per user license fees)
Size (HxWxD)	40.64 x 20.32 x 30.48 cm (16 in x 8 in x 12 in)
Weight	1.2 kg or (2.65 lbs)
Warranty	One-year

*Subject to U.S. export license compliance. Applicable outside the U.S. and Canada.

Recommended accessories – Ti20 Thermal Imager

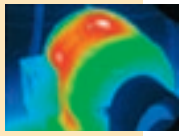
Ti20-Visor
Sun Visor

Ti30-TBP
Rechargeable Battery Pack

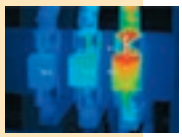
Ti20-CC
Car Charger

For more information and detailed specifications, go to www.fluke.com/thermal_imaging

Typical thermal imaging applications



Electric motors and pumps
Hot spots may be an early indicator of motor winding problems. Elevated temperatures can damage winding insulation, resulting in operational inefficiencies and premature motor failure. An overheated motor may be an indication of an underrated motor in the application, insufficient cooling or electrical power problems.



Bus bars and fuse boxes
Temperature differences between phases may indicate unbalanced loads, harmonics, component problems, bad connections or bad wiring. These conditions can result in increased energy cost and can damage cables or machines or possibly cause fire. Even small temperature differences between phases should be investigated to determine the root cause.

Rotating machinery
Ball bearings showing an increased temperature are an indication that either the quality of the lubricant is deteriorating or there is poor alignment between the motor and shaft. These problems can cause the bearings to fail, or a motor or pump to overheat.

Included accessories

Unlimited-use InsideIR PC software for data storage, analysis and reporting, ac/dc power adapter, USB communication cable, hard carrying case, soft-sided carrying case, wrist strap, two (2) rechargeable battery packs, one (1) AA battery carrier, training materials and getting started guide.

Ordering information

Fluke-TI20 US	Thermal Imager North America
Fluke-TI20 INT	Thermal Imager Ampac
Fluke-TI20 INT 9	Thermal Imager Ampac 9 Hz

Fluke Ti30™ Thermal Imager

Thermal imaging for the industrial technician

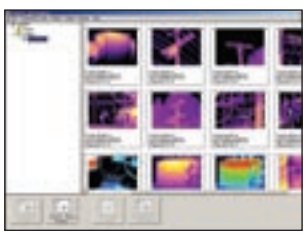
The affordable Fluke Ti30™ Thermal Imager is an unbeatable solution for predictive maintenance:
Complete imaging solution – The Ti30 Thermal Imager is packaged with all necessary accessories, unlimited-use InsideIR™ companion software, and two days of professional thermography training.*
Low cost of ownership – An exceptional value for a high performance imager, the Ti30 also offers affordable instrument service and calibrations.
Designed for industrial use – Over five hours of continuous-use battery life and the capacity to store up to 100 images, allows for a full day of uninterrupted inspections.
Fast and easy inspection routing – Plan your equipment inspection route, load it once into the imager, and then follow the easy, on-camera instructions each time you perform inspections.

*U.S. and Canada only. Training package varies by country. Does not include travel expenses.

Specifications – Ti30™ Thermal Imager

Detector	
Detector type	120 x160 thermal element uncooled focal plane array microbolometer
NETD (Noise equivalent temp. difference)	200 mK
Thermal	
Temperature range	-10 °C to 250 °C (14 °F to 482 °F)
Accuracy	±2 % or ±2 °C (± 3 % or 3 °C from -10 to 0 °C)
Optical	
Optical resolution	90:1
Slit response optical resolution	225:1
Minimum diameter measurement spot	7 mm (0.27 in) at 61cm (24 in)
Field of view (FOV)	17 ° horizontal x 12.8 ° vertical
Target sighting	Single laser dot (Meets IEC Class 2 & FDA Class II requirements)
Controls and adjustments	
Focus	Focusable, 61cm (24 in) to infinity
Temperature scale	°C or °F selectable
Palettes	Gray, ironbow or rainbow
Measurement modes	Automatic, semi-automatic or manual
LCD backlight	Bright, dim, off-selectable
Adjustable emissivity	0.10 to 1.00 by 0.01
Reflected background temperature	-50 °C to 460 °C (-58 °F to 860 °F)
Environmental	
Ambient operating temperature	-10 °C to 50 °C (14 °F to 122 °F)
Relative humidity	10 to 90 % non-condensing
Storage temperature	-25 °C to 70 °C (-13 °F to158 °F) [without batteries]
Other	
Storage capacity	100 images
Power	Rechargable battery pack or 6AAs (not included)
Battery life	Minimum 5 hours continuous use
Image frame rate	20 Hz*, 9 Hz
Thermal analysis software	InsideIR (included)
PC software operating systems	Microsoft® Windows® 2000® or XP®
Weight (includes batteries)	1 kg (2.2 lb)
Warranty	1 year (U.S. only)

*Subject to U.S. export license compliance. Applicable outside the U.S. and Canada.



Store infrared images in InsideIR software

For more information and detailed specifications, go to www.fluke.com/thermal_imaging

Understanding maintenance routing

Predictive maintenance (PdM) programs rely on periodic inspections of the critical assets comprising a plant or facility. These inspections range from visual inspections to nondestructive testing performed using a variety of technologies. To optimize a PdM program, one must develop a series of routes, determining the equipment to be inspected, the frequency of those inspections, and the sequence or physical course for each.

With the Fluke Ti30™ Thermal Imager, images taken on a planned inspection route can be combined with location names and temperature data and uploaded to the camera for use as a "routing guide." The user is prompted to go to each location on the route to take images during subsequent inspections—improving accuracy. New images can easily be compared to previous scans using InsideIR software (included), helping to identify potential problems before they cause failure.

To learn more about predictive maintenance with the Fluke Ti30™ Thermal Imager, go to **www.fluke.com/thermal_imaging**

Included accessories

Unlimited-use InsideIR PC software for data storage, analysis and reporting, docking station with universal power adapter and USB connection, hardshell carrying case, USB field cable, rechargeable battery pack, sun visor, interactive CD, training presentation CD, carrying pouch, wrist strap, and quick reference card.

Optional

NIST Calibration Certificate

Ordering information

Fluke-Ti30 US	Thermal Imager/ North America
Fluke-Ti30 EL	Thermal Imager/ Latin America
Fluke-Ti30 EL/9	Thermal Imager/ Latin America, 9 Hz Version

To request a demonstration, call 1-800-44-Fluke (1+425-446-5500 outside the U.S.) or visit **www.fluke.com/demo**

FlexCam™ TiR4, TiR3, and TiR2 IR Thermal Imagers

The expert's choice for building diagnostics

Fluke TiR2, TiR3, TiR4

Fluke TiR2/FT, TiR3/FT, TiR4/FT

The new Fluke TiR2, TiR3 and TiR4 thermal imagers are for professionals demanding the best and most thorough solutions in building diagnostics applications. The Fluke TiR-Series provides the industry's largest LCD to view on-camera images, augmented with the innovative IR-Fusion™ technology to better pinpoint building problems. IR-Fusion is the overlay of IR and visible images, allowing one to clearly identify critical points within the thermal image.

- Industry leading thermal sensitivity (≤ 0.050 °C NETD on TiR4) (0.07 °C NETD on TiR2 and TiR3) provides solid resolution, and ultra high-quality images.
- IR-Fusion technology automatically merges visual and thermal images pinpointing trouble areas quicker by automatically relating thermal images with the real world. (included with Flk-TiR/FT series, optional with Flk-TiR series)
- The 180° articulating lens is great for viewing around obstructions.
- The 5" high resolution, high contrast display is the biggest display in the industry.
- 320 x 240 focal plane array and 20 mm high quality Germanium lens with continuous single finger focus provide exceptional image resolution (Model TiR2 available with 160 x 120 only).
- SmartView™ professional report writing software generates fast, easy customizable reports including rich image analysis.
- The intuitive operation with on-camera Windows CE interface makes it easy to use.

IR-Fusion™ Technology

Infrared and visible light images fused together on one display.

IR-Fusion Technology captures a visible light image in addition to the infrared image and takes the mystery out of IR image analysis. It helps to better identify and report suspect areas and enable the repair to be done right the first time.

- **Full IR –** for analyzing very high resolution IR imaging. Detect the smallest temperature variations to track down the origin of problems and fully document the extent of remediation. Full IR images are automatically linked to full visible light images.
- **Picture-in-Picture –** for creating an IR "window" surrounded by a visible light frame to easily identify thermal anomalies, while maintaining a frame of reference with surroundings.
- **Alpha blending –** for combining visible and infrared images together in any ratio to create a single image with enhanced detail that will help in precisely locating problems.
- **IR/visible alarm –** for displaying only temperatures that fall above, below, or in between a specified range as IR image, leaving the rest of the scene as a fully visible light image.
- **Full visible light –** a bright, detailed pixel-for-pixel reference image of subject areas for documentation and reporting.

IR InSight XS & XST Thermal Imagers

The New Fluke IR InSight XS & XST portable infrared imagers combine outstanding image quality and thermal sensitivity. They are optimized for low contrast thermal applications encountered in building sciences applications and show problems that other infrared cameras cannot. These easy to use cameras include SmartView™ software to customize and prepare professional infrared survey reports.

- 160x120 focal plane array
- 0.07 °C (Industry leading thermal sensitivity (≤ NETD)
- Simple robust one-button operation
- 3.5-inch, 30 bit color, high resolution, high-contrast display
- SmartView professional report writing software

TiR2, TiR3 and TiR4 Included accessories

AC adapter (for TiR2 and TiR4 only), video cable, 512 MB compact flash card, compact flash card reader and USB cable, PCMCIA compact flash card adapter, SmartView reporting and analysis software on CD, 2 rechargeable battery packs, battery charger, neck strap, heavy duty carrying case and user manual on CD.

InSight XS and XST Included accessories

Serial/USB download adapter kit/ cable, SmartView reporting software on CD, 2 rechargeable battery packs, battery charger, neck strap, heavy-duty carrying case, user manual on CD.

Ordering information

Flk-TIR2-20	IR Flexcam BD Thermal Imager
Flk-TIR2/FT-20	IR Flexcam BD Thermal Imager with IR-Fusion
Flk-TIR3-20	IR Flexcam BD Thermal Imager
Flk-TIR3/FT-20	IR Flexcam BD Thermal Imager with IR-Fusion
Flk-TIR4-20	IR Flexcam BD Thermal Imager
Flk-TIR4/FT-20	IR Flexcam BD Thermal Imager with IR-Fusion
Flk-INSXT-20	IR InSight, 20MM, XST
Flk-INSXS-20	IR InSight, 20MM, XS

Fluke 570 Series Infrared Thermometers

The predictive maintenance professional's precision diagnostic tool

The Fluke 572, 574 and 576 non-contact thermometers are ideal professional diagnostic tools for maintenance professionals requiring the most accurate temperature readings at all distances. Predictive maintenance professionals requiring analysis and documentation use the 574 or 576 models, with 100-point data logging and digital photographs (576 only) with the included software for graphing and analysis for follow-up reporting and documentation.

- Backlit display for poorly lit areas
- Displays last ten temperature readings on bar graph for easy reference
- Enhanced optics (distance to spot ratio up to 60:1) allow measurements of smaller objects from farther away
- Coaxial three-dot laser sighting system highlights the true diameter of measurement spots at all distances
- Adjustable emissivity setting (all models) and 30 pre-set common material values (574, 576) for more accurate measurements
- 100-data point logging for documentation (574, 576)
- Customizable log names, alarms, and emissivity values for personalized measurements (574, 576)
- Software to log, graph, and analyze temperature data via RS-232 (574) connection or USB connection (576, includes photo viewing feature)
- Instantly captures photographs of measurement locations along with temperature and date-time information for improved documentation and maintenance follow-up (576)
- Close-focus option available for specialized applications
- Durable hard plastic storage case

574-NI Nonincendive Thermometer

When safety is a concern and data logging and downloading are required, the Fluke 574 Nonincendive (NI) model thermometer is the product to choose. It has the same great features as the standard 574 model thermometers with the extra confidence of a Factory Mutual approval for use in hazardous environments.

Class I, Division 2, Groups A, B, C, D: Class I, Zone 2 IIC; T4 Ta=50 °C when used with 1.5 V alkaline batteries.

Fluke 576 Photographic Non-contact Thermometer

The Fluke 576 thermometer measures temperature while digitally photographing the measured area and its surroundings. The 576 allows you to:

- Ensure consistency of repeated measurements by using prior photos as a reference.
- Position the laser sighting to assure the measurement area is the same.
- Create customized company reports with the software, data and photos, using standard Windows programs.

Specifications – 572, 574 and 576 IRTs

Models	Fluke-572	Fluke-574	Fluke-574-NI	Fluke-576
Temperature range	-30 °C to 900 °C (-25 °F to 1600 °F)			
D:S (Distance to Spot size)	60:1 [50:1 with close focus option (close focus not available with NI model)]			
Laser sighting	3-dot, coaxial, extra-bright			
Emissivity	Adjustable			Adjustable, plus table of 30 preset values
Accuracy	± 0.75 % of reading or (± 0.75 °C (± 1.5 °F) whichever is greater (assumes ambient operating temperature of 23 °C [73 °F])			
Response time	250 mSec			
Display hold (7 seconds)	Yes			
LCD backlit	Yes			
MAX, MIN temperatures	Yes			
DIF, AVG temperatures	No	Yes	Yes	Yes
Recall last reading	Yes			
Audible/visible HI alarm	Yes			
Audible/visible LO alarm	No	Yes	Yes	Yes
Bar graph display	Yes			
100 points data logging	No	Yes	Yes	Yes
Data graphing software (Windows 2000, XP compatible)	No	Yes	Yes	Yes
Photo viewing software (Windows 2000, XP, NT compatible)	No	No	No	Yes
26 images (640 x 480 pixel)	No	No	No	Yes
100 images (320 x 240 pixel)	No	No	No	Yes
Image file format (.jpg)	No	No	No	Yes
Protective hard case	Yes			
Weight	472 g (1 lb, 1 oz)	480 g (1 lb, 1 oz)	480 g (1 lb, 1 oz)	580 g (1 lb, 1 oz)
Dimensions	16.7 cm x 5 cm x 19.8 cm (6.58 in x 1.97 in x 7.80 in)			16.7 cm x 5 cm x 23.8 cm (6.58 in x 1.97 in x 9.57 in)
Power	2 AA batteries	2 AA batteries/ AC adapter	2 AA batteries/ AC adapter	2 AA batteries/ USB
Warranty	Two-years, conditional			
Additional options/accessories	Nylon holster, NIST Traceable Calibration Certificate	Nylon holster, NIST Traceable Calibration Certificate, Analog cable		

For more information and detailed specifications, go to www.fluke.com/thermometers

Included accessories

2 AA batteries, operator's guide (on CD), durable hard case. thermocouple K probe (574, 576), power supply (574), RS-232 data cable (574), USB 1.1 cable (576), data graphing, storage and analysis software on CD (574, 576)

Ordering information

Fluke-572	Precision Infrared Thermometer
Fluke-572-CF	Precision Infrared Thermometer with Close Focus Option
Fluke-574	Precision Infrared Thermometer w/Logging SW
Fluke-574-NI	Precision Infrared Thermometer w/Logging SW Nonincendive
Fluke-574-CF	Precision Infrared Thermometer w/Logging SW Close Focus
Fluke-576	Precision, Photographic Infrared Thermometer w/Logging SW
Fluke-576-CF	Precision, Photographic Infrared Thermometer w/Logging SW Close Focus

Fluke 54 Series II Thermometer

Lab accuracy in a field thermometer

The Fluke 51, 52, 53 and 54 Series II Thermometers offer high accuracy with fast response times to quickly capture your measurement and show trends. Choose from four models to get the functionality, thermocouple support and data logging you need.

All models offer:

- Laboratory accuracy: ± (0.05 % + 0.3 °C)
- Large backlit dual display presents all the information you need at a glance
- MIN, MAX, and AVG—with time references—captures major events
- Electronic Offset function maximizes overall accuracy by allowing you to compensate for thermocouple errors
- Supports a wide range of thermocouple types
- Temperatures displayed in °C, °F, or Kelvin (K)
- Splash and dust resistant case
- Sleep mode to increase battery life (typical 1000-hour life)
- Battery door allows easy battery replacement without breaking the calibration seal

Powerful data logging capabilities

The Fluke 53 and 54 Series II can log up to 500 points of data to internal memory.

- User-adjustable recording intervals
- Real-time clock captures the exact time of day of events
- Recall function allows logged data to be easily reviewed on the meter display
- For further analysis and graphing, data can be exported to optional FlukeView® PC software using the thermometer's IR communication port

Fluke 561 HVACPro

Two-in-one infrared and contact thermometer for HVAC/R professionals

The Fluke 561 HVACPro combines the temperature measurement functions that professionals need for most HVAC jobs, all in one tool. It measures both IR and contact temperature, replacing several hundred dollars worth of equipment.

- IR thermometer for measurements up close or at a distance, without a ladder
- Contact thermometry capability, compatible with all standard mini-connector K-type thermocouples, preserves your investment in thermocouples
- Velcro® pipe probe for superheat and sub-cooling and other contact and ambient measurements
- MIN, MAX and DIF functions help you quickly identify problems
- Scan large areas or small objects quickly and efficiently

Specifications – 51, 52, 53 and 54 Series II

Feature	51	52	53	54
Thermocouple types	K,J,T,E	K,J,T,E	K,J,T,E,N,R,S	K,J,T,E,N,R,S
Number of inputs	Single	Dual	Single	Dual
Time stamp	Relative time	Relative time	Time of day	Time of day
Temperature measurement accuracy (for temperatures above –100 °C)	Type J,K,T,E,N: ± [0.05 % + 0.3 °C (0.5 °F)] Type R,S: ± [0.05 % + 0.4 °C (0.7 °F)]			
Measurement range (depending on thermocouple type)	–250 °C (–418 °F) to 1767 °C (3212 °F)			
Display resolution	0.1 °C /°F/K < 100° 1° °C/°F/K ≥ 1000°			
Operating temperature	–10 °C to 50 °C (14 °F to 122 °F)			
Storage temperature	–40 °C to 60 °C (–40 °F to 140 °F)			
Humidity	0 % to 90 %; 0 °C to 35 °C (32 °F to 95 °F), 0 % to 70 %; 0 °C to 50 °C (32 °F to 122 °F)			
Weight	400 g (14 oz)			
Size (HxWxD)	17.3 cm x 8.6 cm x 3.8 cm (6.8 in x 3.4 in x 1.5 in)			
Battery	3 AA batteries; typical 1000-hour life			

Recommended accessories – 51, 52, 53 and 54 Series II Thermometers

TPak
ToolPak Meter Hanging Kit
See page 71

80PK-8
Pipe Clamp Temperature Probe
See page 68

80PK-22
SureGrip™ Immersion Temperature Prove
See page 68

80PK-25
SureGrip™ Piercing Temperature Probe
See page 68

FVF-SC1
FlukeView Forms Software
See page 65

For more information and detailed specifications, go to www.fluke.com/thermometers

Included accessories

Fluke 50 Series II includes:
80PK-1 Bead Thermocouple(s), batteries, overview manual and instructional guide on CD-ROM.

Fluke 561HVACPro includes:
Infrared thermometer with contact thermometer capabilities, thermocouple K-type Velcro® pipe probe, hand-carrying case and user manual with HVAC measurement guide.

Ordering information

Fluke-51-2 Digital Thermometer, Single Input
Fluke-52-2 Digital Thermometer, Dual Input
Fluke-53-2 Datalogging Thermometer, Single Input
Fluke-54-2 Datalogging Thermometer, Dual Input
Fluke-561 HVACPro Thermometer

Fluke 68 Infrared Thermometer

Measuring temperature in hard-to-reach, hot, rotating or dangerous situations

Reach for a rugged Fluke IR thermometer. You get easy and safe temperature readings in less than a second.

These handheld portable tools enable professionals to research heating and ventilation problems, monitor the status of electrical motors and electrical panels and diagnose car malfunctions with ease.

Fluke 63, 66 and 68 pistol grip infrared thermometers

The new Fluke 63, 66 and 68 pistol grip thermometers offer an easy to use solution for temperature measurement in hard-to-reach, hot, rotating or dangerous situations.

- Wide temperature range and quick response time
- Superb optics for measuring temperature of surfaces from a distance
- Laser sighting
- Adjustable emissivity (66/68 only) for more accurate temperature measurement

Intrinsically safe Fluke 68 version available (see page 45)

New! Fluke 62 Mini Infrared Thermometer

- Temperature measurement range up to 500 °C (932 °F)
- 10:1 optics
- Accurate to within ± 1.5 % of reading or ± 1.5 °C
- MAX temperature display
- Laser sighting
- Backlit display

Fluke 61 Infrared Thermometers

- Easy to use one button operation
- Easy targeting with bright laser
- Shock-absorbing molding increases ruggedness

Specifications – 561, 61, 62, 63, 66, 68

	561	61	62	63	66	68
Temperature range	–40 °C to 550 °C (–40 °F to 1022 °F)	–18 °C to 275 °C (0 °F to 525 °F)	–30 °C to 500 °C (–20 °F to 932 °F)	–32 °C to 535 °C (–25 °F to 995 °F)	–32 °C to 600 °C (–25 °F to 1100 °F)	–32 °C to 760 °C (–25 °F to 1400 °F)
Emissivity	Adjustable with three settings: Low (0.3), Medium (0.7), High (0.95)	Fixed at 0.95			Digitally adjustable (from 0.1 to 1.0 by 0.01)	
Optical resolution (D:S)	12:1	8:1	10:1 at 80 % energy	12:1	30:1	50:1
Laser sighting (class II)	Single point laser	Offset single point laser				
Response time	500 mSec (95 % of reading)	< 500 mSec	< 500 mSec	≤0.5 second (95 % of reading)		
Minimum usable spot size	25 mm (1 in)				24 mm (0.9 in)	18 mm (0.7 in)
Resolution	0.1 °C (0.1 °F) of reading	0.2 °C (0.5 °F)			0.1 °C (0.1 °F)	
Repeatability	± 0.5 % of reading or ± 1 °C (± 2 °F), whichever is greater	± 2 °C or ± 2 %, whichever is greater	± 0.5 % or ≤ ± 1 °C (± 2 °F), whichever is greater			
Ambient operating temperature	0 °C to 50 °C (32 °F to 120 °F)					
Relative humidity	10 to 90 % RH non-condensing, at < 30 °C (86 °F)	10 to 90 % RH noncondensing, at < 50 °C (120 °F)	10 to 90 % RH non-condensing, at < 30 °C (86 °F) ambient			
Storage temperature	–20 °C to 65 °C (–25 °F to 150 °F)	–20 °C to 60 °C (–4 °F to 140 °F) without battery	–20 °C to 65 °C (–4 °F to 150 °F) without battery	–20 °C to 60 °C (–13 °F to 158 °F) without battery		
Dimensions	17. 8 cm x 16.5 cm x 5.1 cm (7 in x 6.5 in x 2 in)	190 mm x 51 mm x 41 mm (7.5 in x 2 in x 1.6 in)	152 mm x 101 mm x 38 mm (6 in x 4 in x 1.5 in)	200 mm x 160 mm x 55 mm (8 in x 6 in x 2 in)		
Weight	330 g (11.6 oz)	341 g (0.75 lb)	200 g (7 oz)	320 g (11 oz)		
Power	2 AA batteries (alkaline or NiCD)	9 V alkaline or customer supplied NiCd battery				
Battery life (alkaline)	12 hours			10 hours with laser and backlight on, 40 hours with laser and backlight off	20 hours with laser and backlight on 50 % 40 hours with laser and backlight off	
Typical distance to target	Up to 2 m (6 ft)	1 m (3 ft)	Up to 2 m (6 ft)	Up to 2 m (6 ft)	Up to 5 m (15 ft)	Up to 8 m (25 ft)
Warranty	Two-year limited	One-year	Two-year limited	Two-year limited	Two-year limited	Two-year limited

Recommended accessories – 60 Series Thermometers

80PR-60
Temperature Probe
(66/68 only)
See page 69

H6
Meter Case
(63/66/68 only)
See page 70

LVD1
Volt Light
(all models)
See page 64

C510
Meter Case
(61 only)
See page 70

C90
Meter Case
(61 only)
See page 70

For more information and detailed specifications, go to www.fluke.com/thermometers

Included accessories

Fluke 61 includes: instruction sheet and 9 V battery.

Fluke 62 includes: storage pouch and instruction sheet.

Fluke 63, 66, 68 includes: carrying case, hand strap, instruction manual and 9 V battery.

Ordering information

Fluke-61	Infrared Thermometer
Fluke-62	Mini Infrared Thermometer
Fluke-63	Infrared Thermometer
Fluke-66	Infrared Thermometer
Fluke-68	Infrared Thermometer
Fluke-68IS	Intrinsically Safe Infrared Thermometer

Fluke 975 AirMeter™

Five powerful tools in one, with simple one-touch air velocity

The Fluke 975 test tool combines five powerful air quality tools into one. Identify and diagnose indoor air quality issues quickly and easily with one rugged, handheld device. The Fluke 975 measures and simultaneously displays temperature, humidity, CO_2 and CO. At the press of a button, it quickly measures air flow and percentage of outside air.

- Simultaneously measures, logs, and displays temperature, humidity, CO_2, and CO on a bright, backlit LCD display
- One-touch air flow and velocity with available probe*
- Wet bulb and dew point temperature
- % of outside air calculation
- CO_2 and CO field calibration feature
- Automatically compensates for barometric pressure changes
- Min/Max/Average on all measured and calculated readings
- Audible and visual threshold alarms
- Extensive discrete or continuous data logging capacity, downloadable to PC via USB interface

*Included with Fluke 975V, optional with Fluke 975

	Range	Display Resolution	Accuracy
Temperature	-20 °C to 50 °C (-5 °F to 122 °F)	0.1 °C (0.1 °F)	± 0.9 °C/± 1.62°F from 40 °C to 60 °C ± 0.5 °C/± 1.00°F from 5 °C to 40 °C ± 1.1 °C/± 1.98 °F from -20 °C to 5 °C
Relative humidity	10 % to 90 % RH non-condensing	1 %	± 2 % RH (10 % RH to 90 % RH)
Air velocity	50.0 fpm to 3000 fpm 0.25 m/sec to 15 m/sec	1 fpm (0.005m/sec)	±4 % or 4 fpm* ±4 % or 0.02 m/sec* whichever is greater *Accuracy specification only valid for velocity readings above 50 fpm.
CO_2	0 to 5000 ppm	1 ppm	Warm up time 1 min (5 minutes for full specification) 2.75 % + 75 ppm
CO	0 to 500 ppm	1 ppm	± 5 % or ± 3 ppm, whichever is greater, @ 20 °C and 50 % RH

Also available:
Fluke-975CK AirMeter Calibration Kit includes the gases and tools necessary to keep your Fluke 975 AirMeter calibrated.

Fluke-975AP AirMeter Velocity Probe for use with Fluke 975 AirMeter.

Fluke 902 True-rms HVAC Clamp Meter

Get more done

Heating, ventilation, air conditioning (HVAC) technicians require a service tool that can consistently keep up with their demands. The Fluke 902 expands the existing line of quality Fluke clamp meters by delivering the features necessary to diagnose and repair HVAC systems. Combined with True-rms technology and a CAT III 600 V rating, the Fluke 902 helps technicians do their jobs safely and accurately.

- Designed for HVAC applications with capacitance, dc current (µA), and temperature measurements
- Small body and jaws fit perfectly in your hand and into tight places
- Handy 'Display Hold' button keeps measurements on the display
- Meter controls are positioned so current measurements can be done with one hand (index finger on clamp opening lever and thumb on rotary switch)

	Range	Accuracy
Voltage dc	0 - 600 V	1 % ± 5 counts
Voltage ac (True-rms)	0 - 600 V	1 % ± 5 counts (50/60 Hz)
Current ac (True-rms)	0 - 600 A	2.0 % ± 5 counts (50/60 Hz)
Current dc	0 - 200 µA	1.0 % ± 5 counts
Resistance	0 - 9999 Ω	1.5 % ± 5 counts
Continuity	<= 30 Ω	–
Temperature Range	-10 °C to 400 °C (-14 °F to 752 °F) -40 °C to -10 °C (-40 °F to -14 °F)	+/-1.0 % + 0.8 °C (+/-1.0 % + 1.5 °F) typical +/-5.0 % + 1.5 °C (+/-5.0 % + 3.3 °F) typical
Capacitance	1-1000 µF	1.9 % ± 2 counts

Included accessories

Fluke 975 includes: AA alkaline batteries (3), Users manual (with safety information), calibration cap, hard carrying case, FlukeView® Forms software, power adapter, international power plugs, air velocity probe (Fluke 975V only).

Fluke 902 includes: AA alkaline batteries (2), Users manual (with safety information), soft carrying case, T175 Test Leads (1 pair), 80BK Integrated Temperature Probe (1).

Ordering information

Fluke-975	AirMeter™
Fluke-975V	AirMeter™ with Velocity
Fluke-902	HVAC Clamp Meter

Indoor Air Quality Tools

Easy-to-use tools to help you maintain good IAQ

Fluke 971 Temperature Humidity Meter

Temperature and humidity are two important factors in maintaining optimal comfort levels and good indoor air quality. Quickly and conveniently take accurate humidity and temperature readings with the Fluke 971. The Fluke 971 is invaluable for facility maintenance and utility technicians, HVAC-service contractors, and specialists who assess indoor air quality (IAQ). Lightweight and easy to hold, the Fluke 971 is the perfect tool for monitoring problem areas. With a rugged holster and twist-open protective sensor cover, the Fluke 971 is built to perform and made to last.

Features:

- Backlit dual display of humidity and temperature
- Measures dew point and wet bulb temperatures
- 99 record storage capacity
- Ergonomic design with belt clip and protective holster
- Quick-response capacitance sensor with twist-open protective cover
- Compact and lightweight at 188 g (6.6 oz)
- Temperature range from -20 °C to 60 °C (-4 °F to 140 °F)
- Relative humidity from 5 % to 95 %
- Min/Max/Avg Data hold
- Low battery indicator

Fluke 983 Particle Counter

The Fluke 983 Particle Counter measures and displays six channels of particle size distribution. The Fluke 983 holds 5000 logged samples including date, time, counts, sample volume, temperature and relative humidity. Data is easily downloaded using the included windows compatible utility software. The Fluke 983 is invaluable for IAQ investigations, allowing you to determine size distribution of airborne particles or track down a particle source.

Features:

- Compact and easy to operate
- Graphic liquid crystal display with backlight
- Simple connection to computer or printer
- Selectable sample time, count data and programmable delay
- Set sample size to cubic feet or liters, set temperature measurements to °C or °F
- Data displayed in totalize or concentration modes
- Automatic turn-off when battery voltage drops below safe operating level
- Meets JISB9921:1997 and CE standards
- Battery or ac operation with internal rechargeable battery
- Protective holster
- Rugged, hard shell carrying case

Also available:

Fluke 983TPK Thermal Printer Kits
Print the results of a single sample or an entire data logging session with the new Fluke 983 Thermal Printer Kit accessory. Available in 220 V and 120 V models and includes two rolls of thermal printer paper, battery pack, power adapter and serial adapter.

For more information and detailed specifications, go to www.fluke.com/IAQ

CO-220 Carbon Monoxide Meter

- Standalone CO meter that does not require a digital multimeter
- Large backlit LCD displays CO levels from 0 to 1000 ppm
- Beeper triggers with increasing frequency as CO levels rise
- MAX hold function stores and displays the maximum CO level
- Automatic sensor zeroing and self-test upon startup

CO-210 Carbon Monoxide Probe

- Use as an accessory to a digital multimeter with DC millivolt inputs
- Displays CO level readings from 0 to 999 ppm, with a resolution of 1 ppm and accuracy of ± 5 %
- Also used as a standalone device with an LED indicator and beeper that triggers with increasing frequency as CO levels rise

CO-205 Aspirator Kit

The CO-205 flue gas sampling accessory kit includes:

- Stainless steel sampling tube
- Aspirator to draw flue sample
- Replaceable particulate filter
- Nose cap for connection to the Fluke CO-210/CO-220

Included accessories

Fluke 971 includes: operation manual, four AAA alkaline batteries.

Fluke 983 includes: Certificate of Calibration (NIST), Windows compatible software download utility, DB9 to RS-232 adapter and cable, isokinetic probe, high purity tubing, 1/8 in. hose barb adapter, power supply, operation manual, zero count filter, protective holster and hard molded plastic case.

Ordering information

Fluke-971	Temperature Humidity Meter
Fluke-983	Particle Counter
Fluke-983TPK 220	Thermal Printer Kit, 220 V
Fluke-983TPK 120	Thermal Printer Kit, 120 V
Fluke-CO-205	Aspirator Kit
Fluke-CO-210	Carbon Monoxide Probe
Fluke-CO-220	Carbon Monoxide Meter

Fluke ScopeMeter® Test Tools

Handheld oscilloscopes for professionals with challenging troubleshooting situations

The ScopeMeter 192, 196 and 199 high-performance oscilloscopes have bandwidth of 60, 100 and 200 MHz and sample rates up to 2.5 GS/s. The C models add a high-resolution color display that has a fast update rate, waveform pass/fail testing and a digital persistence mode—making the analysis of complex and dynamic signals that much easier.

For industrial, electronic or electro mechanical applications, the 123 and 124 Industrial ScopeMeters feature 20 MHz bandwidth, Connect-and-View™ software for quick measurements and a dual DMM and paperless recorder to get virtually any job done.

Specifications – ScopeMeter® Test Tools

	Fluke 199C	Fluke 196C	Fluke 199B	Fluke 196B	Fluke 192B	Fluke 124	Fluke 123
Bandwidth	200 MHz	100 MHz	200 MHz	100 MHz	60 MHz	40 MHz	20 MHz
Max real time sample rate	2.5 GS/s	1.0 GS/s	2.5 GS/s	1.0 GS/s	0.5 GS/s	25 MS/s	25 MS/s
Max record length (per input)	3000 Points					512 Points (min/max pairs)	
Number of Inputs	2 Scope and 1 DMM (Isolated)					2 Scope Or DMM	
Input sensitivity	2 mV/div. to 100 V/div.		5 mV/div. to 100 V/div.			5 mV/div. to 500 V/div.	
Independently isolated floating inputs	•						
Display and display modes							
Display	Color		Monochrome			Monochrome	
Persistence	Digital with variable decay		On/Off			–	
Envelope mode	•					•	
Waveform compare	•						
FFT	•						
Pass/fail testing	•						
Triggering							
Connect-and-View™ trigger	•					•	
Edge, single, free run	•					•	
Video	•					•	
Video lines	•					•	
Pulse width	•						
External	•					With ITP 120 Option	
Advanced functions							
Cursors	•					•	
Zoom	•						
Dual input Trendplot™	•						
ScopeRecord™ mode	•						
Automatic capture and replay last 100 screens	•						
Waveform mathematics	•						
Save setups and screens	10					20	10
True-rms multimeter	5000 Counts Volts, Amps, Ohms, Continuity, Diode, Temp						
Safety, power and warranty							
Safety (EN61010-1)	CAT II 1000 V/CAT III 600 V					CAT III 600 V[1]	
Battery	4-hour Ni-MH					7-hour NiMH	7-hour NiMH
Line power	Adapter/battery charger included						
PC printer interface	Yes, using optional optically isolated cable						
Warranty	Three-year on main instrument/one-year on standard accessories						

[1]Max input voltage CAT II 1000 V with VPS40, 40 MHz 10:1 voltage probe.

Recommended accessories – ScopeMeter Test Tools

Model	Description	192, 196, 199	123, 124
SCC 120	Software, cable and carrying case package		•
SCC 190	Software, cable and carrying case package	•	
C125	Compact soft case		•
C195	Universal soft carrying case	•	
PAC91	Optical to parallel printer adapter cable	•	•

Connect and View™

For more information and detailed specifications, go to www.fluke.com/scopemeter

Fluke 124 and 123 Industrial ScopeMeter® Test Tools

Three-in-one simplicity for fast answers wherever you work

The compact ScopeMeter 123 and 124 are the rugged solution for industrial troubleshooting and installation applications. These are truly integrated test tools, with oscilloscope, multimeter and "paperless" recorder in one affordable, easy-to-use instrument. Find fast answers to problems in machinery, instrumentation, control and power systems.

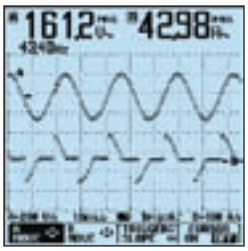
- A dual input 40 MHz or 20 MHz digital oscilloscope
- Two 5,000-count true-rms digital multimeters
- Cursor measurements (Fluke 124 only)
- A dual input TrendPlot recorder
- Connect-and-View trigger simplicity for hands-off operation
- Shielded test leads for oscilloscope, resistance, continuity and capacitance measurements
- Full bandwidth, heavy duty 10:1 probe (Included standard with Fluke 124)
- Up to seven hours battery operation with standard battery
- CAT III 600 V safety certified
- Optically isolated RS-232 interface
- Rugged, compact case

Electrical Safety 600 V CAT III

UL LISTED

A three-in-one tool

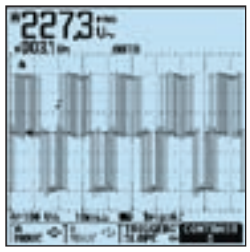
The ScopeMeter 123 and 124 combine a 40 MHz or 20 MHz dual input digital storage oscilloscope, two true-rms digital multimeters and a dual input TrendPlot™ recorder all in a compact, battery powered instrument. Leave all other test tools behind because the ScopeMeter 123 and 124 Test Tools are the only one you'll need.



Dual-input measurement shows both meter reading and waveform at the same time (124, incl. cursors)

Connect-and-View™ triggering for an instant, stable display

Scope users know how difficult triggering can be. Incorrect settings show unstable and sometimes incorrect results. Fluke's unique Connect-and-View recognizes signal patterns, and automatically sets up correct triggering. It provides a stable, reliable and repeatable display of virtually any signal including motordrive and control signals—without touching a button. Signal changes are instantly recognized and settings adjusted for once again a stable display.



Connect-and-View captures even the most complex motor drive signals

One test lead measures all

High-frequency waveform, meter, capacitance and resistance measurements and continuity checks are all covered by the shielded test leads. No time wasted finding or swapping leads. The included accessories allow hook-up at test objects of every dimension.

Battery powered mobility

Up to seven hours of battery operation frees you from mains outlets for true on-the-move working. The handheld format and the weight of just 1.2 kg, make the instrument easy to carry and to fit comfortably in your hand. The rugged, drip proof case assures long life and reliable operation in the harshest industrial environments.

Use TrendPlot,™ dual channel recorder, to help find intermittents, fast

The toughest faults to find are those that happen only once in a while—intermittents. They can be caused by bad connections, dust, dirt, corrosion or simply broken wiring or connectors. Other factors, like line outages and sags, or the starting and stopping of a motor can also cause a machine to stop. You may not be around to see it—your Fluke ScopeMeter will. In this "paperless recorder" mode, you can plot the min, max, peak and average values over time, up to 16 days. The two inputs can plot any combination of volts, amps, temperature, frequency and phase, with time and date stamp- to help lead you to the cause of those faults quickly.

Application note, literature code 2126072:

Verifying CAN bus signals with a Fluke ScopeMeter 120 Series

Verifying the physical layer signals of two-wire differential serial bus system. Read a detailed application note on **www.fluke.com/scopemeter**

Check the starting capacitor of a motor with the ScopeMeter 124

Safety certified

The 123 and 124 ScopeMeter Test Tools and the included shielded test leads are safety certified for measurements on CAT III 600 V industrial power systems. Via the optically isolated OC4USB interface, the 123 and 124 can be safely connected to a printer for direct print-out or to a PC for later analysis and documentation using FlukeView software. And using the VPS40 probe, measurement up to CAT II 1000 V are fully supported.

Ordering information

FLUKE-124/003	Industrial ScopeMeter 40 MHz
FLUKE-124/003S	Industrial ScopeMeter 40 MHz with SCC Kit
FLUKE-123/003	Industrial ScopeMeter 20 MHz
FLUKE-123/003S	Industrial ScopeMeter 20 MHz with SCC Kit

For more information and detailed specifications, go to www.fluke.com/scopemeter

Fluke 192, 196 and 199 ScopeMeter® Test Tools

Speed, performance and analysis power. See more, fix more with color.

Whether you are performing routine maintenance and calibration, or troubleshooting the hardest to solve problems like intermittent failures or sources of unwanted noise—the Fluke ScopeMeter 192, 196 and 199 include all the tools needed to get the job done. With 200 MHz bandwidth, up to 2.5 GSa/s real-time sampling rate, 27500 points memory for high resolution waveform ScopeRecord™, measurement TrendPlot™ and FFT analysis, analyzing signal details, finding random glitches and sources of unwanted noise or interference become routine tasks.

- Dual-input—200, 100 or 60 MHz bandwidth
- Up to 2.5 GS/s real-time sampling and 3 k points memory per input
- Automatic and advanced triggering functions—Connect&View, pulse width, dual slope and n-cycle for synchronizing on specific waveform details
- Fast Fourier Transform (FFT) for frequency domain, spectrum display of signal harmonics or fidelity. (C models)
- Digital persistence for analyzing complex dynamic waveforms like on an analog scope (C models)
- Automatic capture and replay of 100 screens
- 27,500 points per input record length using ScopeRecord mode
- TrendPlot paperless chart recorder for trend analysis up to 22 days
- Waveform reference for visual comparisons and automatic pass/fail testing (C models) of waveforms
- Five hours rechargeable Ni-MH battery pack

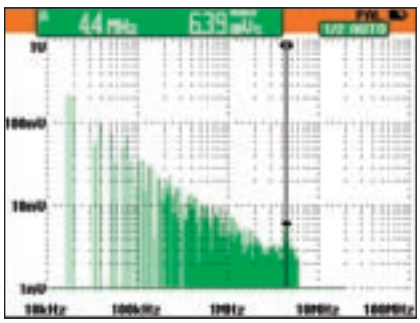
Electrical Safety Dual Rated CAT III and CAT IV

See what's really happening

With a maximum real-time sampling rate of 2.5 GS/s per input, you can see what really happens, with 400 ps resolution. Both inputs have their own digitizer, so you can simultaneously acquire two waveforms and analyze them with the highest resolution and detail. If an anomaly flashes by on the screen, just press the Replay button to see it again.

Frequency Spectrum Analysis

All C models now include Frequency Spectrum Analysis functionality based on Fast Fourier Transformation (FFT) analysis as a standard feature. This makes it possible for you to identify the individual frequency components contained in a signal. The spectrum analysis function is also handy to reveal the effects of vibration, signal interference or crosstalk. An automatic window function assures optimal windowing, although you may manually select your preferred time window.



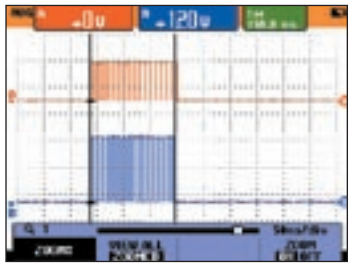
Automatic capture and replay of 100 screens

Scope users know how frustrating it is to see a one-time anomaly flash by—never to be seen again. Not with the ScopeMeter 190 Series. Now you can look back in time with a touch of the replay button. In normal use, the instrument continuously memorizes the last 100 screens. Each time a new screen is acquired, the oldest is discarded. At any moment you can "freeze" the last 100 screens and scroll through picture-by-picture or replay as a "live" animation. Cursors can be used for further analysis.

Deep memory for high-resolution ScopeRecord™ and Trendplot™

The ScopeRecord memory stores 27,500 points per input, for high-resolution recording of waveform events up to 48 hours, and captures fast intermittents and glitches as short as 50 ns. This continuous roll mode also stores events like motion profiles, UPS, power supply and motor start-ups.

In Trendplot or "paperless recorder" mode, you can plot the minimum, maximum peak and average measurement (DMM or Automatic Scope) values over time—up to 22 days. The two inputs can plot any combination of volts, amps, temperature, frequency and phase with time and date stamp to help lead you to the cause of those faults quickly.



Waveform Pass/Fail testing

Waveform reference allows an acquired trace to be stored and designated reference trace for visual comparisons, or it can be used as the reference for automatic Pass/Fail testing (C models only). Up to 100 individually matching (Pass) or non-matching (Fail) waveforms can be stored in the replay memory (C models only), allowing you to monitor your system's behavior over a long period of time, without the need for you to attend!

Application note, literature code 2043253:

All DSO isolated channels are not the same

Displaying information from multiple information sources—"channels" at once is critical to troubleshooting and maintaining today's complex equipment and most modern power control systems' circuitry require different reference measurements. Now one tool will do it all.

Go to **www.fluke.com/scopemeter** for more information.

Ordering information

Fluke-192B/003	ScopeMeter 60 MHz B/W
Fluke-192B/003S	ScopeMeter 60 MHz B/W with SCC kit
Fluke-196B/003	ScopeMeter 100 MHz B/W
Fluke-196B/003S	ScopeMeter 100 MHz B/W with SCC kit
Fluke-199B/003	ScopeMeter 200 MHz B/W
Fluke-199B/003S	ScopeMeter 200 MHz B/W with SCC kit
Fluke-196C/003	ScopeMeter 100 MHz color
Fluke-196C/003S	ScopeMeter 100 MHz color with SCC kit
Fluke-199C/003	ScopeMeter 200 MHz color
Fluke-199C/003S	ScopeMeter 200 MHz color with SCC kit

For more information and detailed specifications, go to www.fluke.com/scopemeter

Fluke ScopeMeter® Test Tool accessories

Measurements made easier

FLUKE®

Data Sheet, literature code 1629076:

ScopeMeter accessories

Fluke accessories can enhance or expand the measurement capabilities of your ScopeMeter.

Go to **www.fluke.com/scopemeter** for your copy of the ScopeMeter accessories data sheet.

Cable and adapters

PAC91
- Printer Adapter Cable 0.25 m
- Safety designed optical to parallel printer adapter cable
- See instrument manual for compatible printers

PM9091
- 50 Ohm Coaxial BNC cable set, 3 x 1.5 m
- Three colored BNC male connectors (red, gray and black) for easy identification

OC4USB
- Optically-isolated serial to USB adapter

PM9092
- 50 Ohm Coaxial BNC cable set, 3 x 0.5 m
- Three colored BNC male connectors (red, gray and black) for easy identification

PM9081
- Dual Banana Plug 4 mm male to female BNC Adapter
- The set consists of two adapters

PM9093
- Male BNC to dual female BNC T-piece
- Set consists of two adapters

PM9082
- Dual Banana Jack 4 mm female to male BNC Adapter
- The set consists of two adapters easy identification

BB120
- Two shielded Banana-to-BNC Adapters
- Adapting Probes and BNC adapters to 123 and 124 ScopeMeter Test Tools

Trigger and differential probes

DP120 Differential Probe
- 1.5 m with shrouded banana probe tips (red and black)
- CAT III 600 V/CAT II 1000 V rated

ITP120 Optically Isolated Trigger Probes
- 1.2 m, for ScopeMeter 123
- Included hookclip with ground lead
- Max. signal voltage and voltage to ground: CAT II 600 V rms

Software, carrying cases and kits

SCC120 Software Cable Case for 123, 124
SCC190 Software Cable Case for 192, 196, 199

Accessories package, including:
- FlukeView® ScopeMeter® Software for Windows® English, French and German language
- OC4USB Optically Isolated RS-232 Adapter/Cable
- Hard Carrying Case C120 or C190

C120 Hard Carrying Case for 123, 124
C190 Hard Carrying Case for 192, 196, 199
- Storage compartments for test leads, probes, instruction manual, power adapter and other small accessories

C195 Soft Carrying Case Universal
- Durable soft case. Adjustable storage compartments suitable for all ScopeMeter models. Storage compartments for test leads, probes, instruction manual, power adapter and other accessories

C125 Compact Soft Case for 123, 124
- Zippered carrying case (black) for 123, 124
- Pouch is designed to carry test leads and probes
- Convenient belt loop accommodates tool belt

For more information and detailed specifications, go to www.fluke.com/scopemeter

Fluke accessory selection guide

Find the right accessories to make your meter work for you

		10/11/12/12B	110/111/112	114/115/116/117	21/23/26/75/77/79	27	70/73 III	175/177	179	83/85/87 III/83V	87/89 IV	87V	187/189	45	39/41B	43B	90 Series	120 Series	190 Series	50S/50D	51/52/53/54 II	61/65	63/66/68	321/322	333/334/335/336/337	705/707	712/713	714	715	716/717	718	725/726	741/743	744	787/789	T3/T5	1587	1577
Current	i200				•	•	73																											3		•	•
	i200s	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•															•		•	•
	i400				•	•	73	•	•	•	•	•	•	•																				3		•	•
	i400s	4	4	4	4	4	4	4	4	4	4	4	4	4	4	•	•	•	•															3		4	4
	80i-600A				•	•	73	•	•	•	•	•	•	•																				•		•	•
	i1000s	4	4	4	4	4	4	4	4	4	4	4	4	4	4	•	•	•	•															•		4	4
	i2000 flex	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•														3	3		•		•	•
	i3000 flex				4										4	•	•	•	•															•		4	4
	i3000s	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•														3	3	•		•	•
	i410	•		•	•	•	•	•	•	•	•	•	•	•		5	5	5	5														3	3	•		•	•
	i1010	•		•	•	•	•	•	•	•	•	•	•	•		5	5	5	5														3	3	•		•	•
	i30/i30s				•										•	•	•	•	•																•		•	•
Temperature	80AK			•					•		•	•	•																						•			
	80BK			•					•		•	•	•																						•			
	All 80PK Probes	1	1	2	1	1	1	1	2	1	2	2	2	1		1	1	1	1	•	•							•	1			•	•	•	1		2	
	80PJ-1/80PJ-9																			•	•							•				•	•	•			2	
	80PT-25																				•							•				•	•	•			2	
	80TK	•	•		•	•	•	•		•				•		•	•	•	•										•						•			
	80T-150U	•	•		•	•	•	•		•	•	•	•	•		•	•	•	•										•						•		2	
	80PJ-EXT																			•	•							•				•	•	•			2	
	80PK-EXT	1	1	2	1	1	1	1	2	1	2	2	2	1		1	1	1	1	•	•							•	1			•	•	•	1		2	
	80PT-EXT																				•							•				•	•	•			2	
	80CK-M	1	1	2	1	1	1	1	2	1	2	2	2	1		1	1	1	1	•								•	1			•	•	•	1		2	
	80CJM																			•	•							•				•	•	•			2	
	80PR-60																						66/68														2	
Cases	C50	•	•	•	•		•	•	•	•		•								•	•	65													787			
	C520																																			•		
	C550/C1600																																					
	C12A	•	•	•																						•												
	C23	•	•	•																		61																
	C25				•	•	•	•	•	•	•	•	•							•	•	61		•				•	•	•		•			•		•	•
	C33																							•	•		•									•			
	C43									•	•	•	•		•	•		•															•	•	•				
	C90		•	•	•		•	•	•											•	•	65																
	C125		•	•	•		•	•	•	•	•	•	•					•									•							•				
	C789														•	•		•													•		•	•	•				
	C20					•				•	•	•	•																			•			789			
	C101	•	•	•	•	•	•	•	•	•	•	•						•		•	•			•	•	•	•	•	•	•		•			•		•	•
Holsters	C10	•*		•*																						•	•											
	C70Y						•													•																			
	H80M									•	•	•															•	•	•	•					787				
	H3																								•													
	H5																																			•		•
	H6																						•															
	ToolPak Meter Hanger		•					•	•	83V	•	•	•								•											•			787		•	
Test Leads	Standard Test Lead Input	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U					U	U	U			U	U	U	U	U	U	U		U	U
	TL220	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•					•	•	•			•	•	•	•	•	•	•		•	
	TL223	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•					•	•	•			•	•	•	•	•	•	•		•	
	TL225	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•					•	•	•			•	•	•	•	•	•	•		•	
	TL238	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•					•	•	•			•	•	•	•	•	•	•		•	
	TL80A							•	•	•	•	•	•	•			•	•	•																				
	TL81A							•	•	•	•	•	•	•			•	•	•																				
	TL71	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•					•	•	•			•	•	•	•	•	•	•		•	
	TL76	•	•	•	•	•	•	•	•	•	•	•	•				•	•	•					•	•	•			•	•	•	•	•	•	•		•	
Specialty	FlukeView Forms Software										•		•	•							•**														789			
	PV350 (pressure)	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•							•		•					•	•	•			
	FOM (fiber optic)	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•							•		•					•	•	•			
	C0-210	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•							•		•					•	•	•			
	80K-6, 80K-15, 80K-40	dc	dc	dc	•	•	•	•	•	•	•	•	•	dc																					•			

(1) Requires 80TK (2) Requires 80AK (3) Limited low level ac capability – see page 40 (4) Requires PM9081/001 Adapter (5) Requires PM9082/001 adapter

U A universal accessory. Works with most brands of meters. For detailed Current Clamp specifications see pages 58 and 59. *included with the 12B and 16 ** 53, 54 only

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke accessory sets and kits

Combines our most popular accessories into a convenient money saving package

New! TL225 SureGrip™ Stray Voltage Adapter Test Lead Kit

- **Stray Voltage Adapter**
- **TL224** Suregrip Silicone Test Leads
- **TP220**Suregrip Test Probes
- **C75** Soft Accessory Case

TLK281 Automotive Test Lead Kit

- **TP81** Insulation Piercing Probes
- **TL224** Suregrip Silicone Test Leads
- **TP220** Suregrip Test Probes
- **AC220** Suregrip Plunger Style Alligator Clips
- **AC285** Suregrip Alligator Clips
- Handy Fluke carrying case
- **TP81** rated to 60 V dc; all others rated to CAT III 1000 V, CAT IV 600 V

TLK282 Deluxe Automotive Test Lead Kit

- **TP81** Insulation Piercing Probes
- Set of five TP40 Automotive Back Probe Pins
- **TL224** Suregrip Silicone Test Leads
- **TP220** Suregrip Test Probes
- **AC220** Suregrip Plunger Style Alligator Clips
- **AC285** Suregrip Alligator Clips
- **C280** Suregrip Hook Clips
- Handy Fluke carrying case
- **TP81** and **TP40** rated to 60 V dc; all others rated to CAT III 1000 V, CAT IV 600 V

TLK-220 SureGrip™ Accessory Kit with Meter Carry Case

- **AC220** Plunger Style Alligator Clips
- **AC285** Large Jaw Alligator Clips
- **TP220** Sharp Test Probes
- **TL224** Right to Straight Test Leads
- Zippered vinyl carry case with moveable divider
- Holds large DMMs

TLK-225 SureGrip™ Master Accessory Kit

- **AC220** Plunger Style Alligator Clips
- **AC280** Plunger Style Hook Clips
- **AC283** Plunger Style Pincer Clips
- **AC285** Large Jaw Alligator Clips
- **TP220** Sharp Test Probes
- **TL224** Right to Straight Test Leads
- 6-pocket storage pouch, keeps the entire set together

T5 Tester Starter Kit

Getting started kit for electricians who already own a Fluke T5 Tester.

- **TP220** Test Probes
- **AC285**Large Jaw Alligator Clips
- **C33**Zippered Soft Case

TL238 SureGrip™ Test Lead Set for high energy environments

- Insulated tip probes help lessen risk of arc flash explosion
- Probe extenders keep hands away from live current
- Includes one pair each, insulated test tip probes, probe extenders and TL224 test leads
- Probes and leads CAT III 1000 V, CAT IV 600 V, 10 A, extenders CAT III 1000 V 10 A

TL220 Industrial Test Lead Set

- Starter kit for industrial applications
- TP220 has round, stainless steel tip
- Includes 1 pair: AC220, TP220, TL222
- CAT III 1000 V, CAT IV 600 V, 10 A

TL223 Electrical Test Lead Set

- Starter kit for electrical applications
- TP1 has flat blades for wall sockets
- Includes 1 pair: AC220, TP1, TL224
- CAT III 1000 V, CAT IV 600 V, 10 A

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke SureGrip™ accessories

A complete set of probes, leads and clips

FLUKE®

SureGrip accessories provide a reliable grip in slippery hands. Rubber-overmolded surfaces and finger-hugging curves give the user a comfortable, steady hold on the accessory so they can focus on making an accurate measurement.

Modular test leads and test probes (use test probes with test leads)

TL221 SureGrip™ Silicone Test Lead Extension Kit
- Superior strain relief
- Includes two adapters to extend leads 1.5 m
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TL222 SureGrip™ Silicone Insulated Test Leads
- Recommended for use with AC220, AC280, AC283 test clips
- Superior strain relief
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TL224 SureGrip™ Silicone Insulated Test Leads
- 1.5 m silicone-insulated wire resists heat and cold
- Superior strain relief
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TL27 Heavy Duty Test Leads
- Rugged EPDM insulation
- 1.5 m long with shrouded, straight connectors and excellent strain reliefs on each end
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TP1, TP2, TP4 and TP38 Slim Reach™ Test Probes
- Slender probe bodies for probing closely spaced or recessed points
- TP1 has a flat blade
- TP2 has 2 mm diameter tip
- TP4 has 4 mm diameter tip
- TP38 has stainless steel insulated probe to help lessen the risk of arc flash explosion
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TP220 SureGrip™ Industrial Test Probes
- Sharp, 1/2 in. stainless steel tip provides reliable contact
- Flexible finger barrier improves grip
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

Push-on clips

AC72 Alligator Clips
- Slide-on style for test probes
- Jaws open to 8 mm
- For use with TL71 and TL75 test lead and probe sets
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

Test lead and probe in one

TL71 Premium DMM Test Lead Set
- Flexible silicone insulated leads are heat and cold resistant
- Distinctive comfort grip probes
- Recommended for µV measurements
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A

TL28A Automotive Test Lead Set
- Large, solid copper alligator clips with 0.5 in. opening
- Flexible silicone insulated lead are heat and cold resistant
- CAT I 30 V, 10 A

TL76 2 mm/4 mm Test Lead Set
- 2 mm threaded probes with removable 4 mm banana-style spring contacts
- Flexible 1.5 m silicone leads
- CAT III 1000 V, CAT IV 600 V, 10 A

TL75 Hard Point Test Lead Set
- Extremely hard alloy tips resist wear
- Distinctive comfort grip probes
- CAT III 1000 V, 10 A, CAT IV 600 V, 10 A
- 1.5 m PVC leads

Modular clips (for use with test leads)

AC220 SureGrip™ Alligator Clips
- Insulated, nickel plated jaws grip objects up to 3/8 in.
- Blunt tip grabs round screw heads
- CAT III 1000 V, CAT IV 600 V, 10 A

AC280 SureGrip™ Hook Clips
- Profile narrows to .22 in. at tip
- Hook opening .20 in. at front, .08 in. at base
- CAT III 1000 V, CAT IV 600 V, 3 A

AC283 SureGrip™ Pincer Clips
- 4.5 in. flexible, insulated shaft
- Nickel plated pincers open to .20 in.
- CAT III 1000 V, CAT IV 600 V, 1 A

AC285 SureGrip™ Alligator Clips
- Multi-purpose tooth pattern grips anything from fine gauge wire to a 3/4 in. nut
- Nickel-plated steel jaws
- CAT III 1000 V, CAT IV 600 V, 10 A

AC89 Heavy Duty Insulation Piercing Clip
- Plunger style, safety grip operation with insulated jaws
- Small pin pierces 30 to 14 AWG insulated wire
- CAT III 1000 V, 5 A, CAT IV 600 V, 5 A

AC87 Heavy Duty Bus Bar Clip Set
- One pair (red, black) of flat, right angle design for connecting to bus bars
- Adjustable collar provides two ranges of jaw openings up to 30 mm
- CAT III 1000 V, 5 A rating

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke test leads, probes and clips

Test leads for all your measurement needs

FLUKE®

For electronic applications

TL80A Basic Electronic Test Lead Set
- 6 piece set with zippered case
- Probes, alligator clips and tip extenders for electronic applications
- CAT II 300 V

TL910 Electronic Test Probes with Replacement Tips
- Small profile provides accessibility
- Comes with 5 sets of replaceable tips
- Replacement tips: TP912
- CAT III 1000 V, 3 A

TL81A Deluxe Electronic Test Lead Set
- 22 piece set with quadfold pouch
- Includes mini alligator clips, hooks and pincers for virtually every electronic need
- Slide-on IC probe tip adapter and test lead couplers
- Both modular test leads and lead-probe combinations
- CAT II 300 V

TP80 Electronic Test Probes
- Tapered tip ideal for probing electronic components or boards
- Removable guard for IC probing
- CAT III 1000 V, 10 A

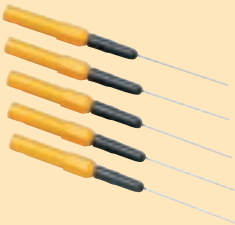
TP920 Test Probe Adapter Kit
- IC test tip adapters, extended tips, medium alligator clips fit over TL71 and TL75 test lead sets
- IC test tip Adapter, 3 A
- Extended probe tip, 3 A
- Med. alligator clip, 5 A
- CAT II 300 V

TL40 Retractable Probe Assembly
- Retractable, insulated sharp probe tip
- CAT II 300 V, 2 A

TL26A Telecom Test Lead Set
- 5-way multipoint test clips for telecommunications applications
- Flexible silicone insulated leads are heat and cold resistant
- CAT I 30 V, 8 A

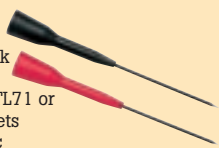
For automotive applications

New! TP81, TP82 and TP84
New piercing probes for Automotive applications. Control the depth as you pierce insulation.
- Stainless steel probe pierces insulation on 14, 16 and 18 gauge wire
- Design provides complete insulation while working on fuel injectors or sensors
- TP81 for use with modular test leads (Fluke TL224)
- TP82 slips over probe tips (Fluke TL71)
- TP84 is 12 inches long to reach farther into engine compartments.
- Rated to 60 V dc



New! TP40 Automotive Back Probe Pin Set
- Set of five 1.5 inch pins Rated to 60 V dc
- Provide an easy connection past weather pack seals to connector conductors
- Use with Fluke TL71 or TL75 test lead sets

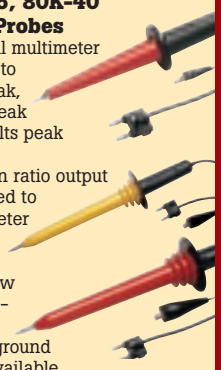
New! TP88 Rigid Backprobe Pin Set
- 2 inch long pins pass between the weather pack seal and wire
- Use with Fluke TL71 or TL75 test lead sets
- Rated to 60 V dc



New! TL82 Automotive Pin & Socket Adapter Set
- Collection of male and female adapters allows you to make firm connection to pin and socket connectors
- Adapters with flexible tips come in the following sizes: 22, 20, 16 and 12
- Rated to 60 V dc

High-voltage probes

80K-6, 80K-15, 80K-40 High Voltage Probes
- Allows a digital multimeter to measure up to 6,000 volts peak, 15,000 volts peak and 40,000 volts peak respectively
- 1000:1 division ratio output when connected to 10 MΩ multimeter
- Ground clip included
- Intended for low energy applications that are referenced to ground
- 80K-15 (not available in Europe)



For more information and detailed specifications, go to www.fluke.com/accessories

Fluke illuminates the task at hand

Get all the light you need and keep your hands free

LVD1 Volt Light
Non-contact ac voltage detector and LED flashlight combined in one convenient, compact design. Exclusive dual-sensitivity.

- Detects voltages from 40 V ac to 300 V ac
- Voltage detector glows blue at 50 Hz to 60 Hz or 2.5 cm to 38 cm (1 in to 5 in) away from source
- Ultra-bright white LED with 100,000 hour bulb life
- AAA battery included

L205 Mini Hat Light
Rugged, high-intensity Xenon worklight

- Attaches to a baseball cap
- Includes a hat clip
- Includes two AAA batteries
- Waproof

L200 Probe Light
- Small, rugged light easily attaches to any Fluke test probe
- Bright white LED never burns out
- 120-hours of battery life
- Two 3 V watch batteries included

L207 High-Intensity Light with Limited Edition Fluke Cap
- Includes L205 Mini Xenon worklight
- Black baseball-style cap with Fluke logo
- Light is waterproof
- Includes two AAA batteries

L206 Deluxe LED Hat Light (hard hat not included)
Attach it to a hard hat, a baseball cap, or even a panel door for all the light you need

- Three super bright white LEDs—never burn out
- Special hard-hat attachment included
- 40-hour battery life
- Includes three AAA batteries

Shed light on the point of contact

L211 Probe Light Kit
- **L200**probe light
- **TL71** premium DMM test lead set
- **C75** zippered case

L215 SureGrip™ Kit with Probe Light and Probe Extenders
- **L200**probe light
- **TP220** SureGrip test probes
- **TL224**SureGrip test leads
- **TP280** test probe extenders
- Soft foldable pouch, keeps the entire set together

L210 Probe Light and Probe Extenders
- 8 in. probe extenders fit modular test probes
- Probe and extender length complies with NFPA recommendations
- Bright white LED illuminates contact area
- Probe light fits on extender or test probe

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke specialty accessories and software

Extend the utility of your multimeter

Logging software

FlukeView® Forms

Harness the power of the data logging function on your Fluke Digital Multimeter, Thermometer or ProcessMeter. Log live readings while connected to a PC, or leave your Fluke 189, 789 or 54-II in place to capture up to 1,000 readings for download to a PC. FlukeView® Forms easy-to-use wizards allow you to download readings from your Fluke tool and store and display individual readings or a series of measurements. Spot trends and document interruptions or spikes. Use standard forms or the FlukeView® Designer feature to customize reports using your specific data or company logo. Free demo-reader download allows co-workers or clients to open your report and interact with captured data.

Choose the model that's right for you:

- FVF-SC1: Includes software and cable used with 53-II and 54-II Thermometers and 87IV and 89IV DMMs
- FVF-SC2: Includes software and cable used with 180 Series DMMs and 789 ProcessMeters
- FVF-SC3: Includes software and cable used with 45 Bench Meters

Go to **www.fluke.com/flukeviewforms** to download the demo.

New! FlukeView® Forms Basic

An abridged version of FlukeView Forms. Analyze and share data with the provided standard forms. Available for use with 180 Series DMMs and 789 ProcessMeters, only. Upgrade to the full FlukeView Forms with FVF-UG.

Make extended logging easier

New! BP189 High Capacity Battery Pack for Fluke 180 Series Multimeters

- Expands battery life up to 450 hours
- Accepts four C batteries
- Allows you to use your Fluke 189 to continually log data for up to two weeks

Stray voltage

New! SV225/10PAK

- Pack of 10 stray voltage adapters
- Adapter makes sure meter has low input impedence that eliminates stray voltage

Pressure and vacuum

PV350 Pressure Vacuum Module

- Digital pressure and vacuum measurements in a single module
- Measures HVAC/R, hydraulic and pneumatic pressures to 350 psig/ 2413 kPa (usable to 500 psig)
- Measures to 76 cm Hg (29.9 in Hg) vacuum (not intended for measuring microns of vacuum)
- Compatible with most popular digital multimeters

Fiber optics

FOM Fiber Optic Meter

The Fluke Fiber Optic Meter (FOM) helps you test and maintain fiber optic cable without having to buy a whole new meter. Plug the FOM directly into any DMM with a mV dc funtion and a 10 mΩ input impedance, and quickly and accurately verify fiber optic cable system loss. Light sources and patch cords sold separately.

FOS 850 and FOS 850/1300 Fiber Optic Light Sources

A variety of LED light sources allow you to test different cables.

H900 Test Lead Holder

- Heavy duty construction with mounting holes
- Holder has 10 slots for wires up to 8 mm in diameter
- Over-all dimensions: 27.9 cm L x 8.9 cm W x 3.2 cm H
- One-year warranty

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke current clamps

For use with DMMs, scopeMeters and power quality analyzers

AC current clamp specifications

	i200	i200s	i400	i400s	80i-600A	i1000s	i2000 flex	i3000s flex
AC current range	1 A to 200 A	1 A to 200 A	1 A to 400 A	0.5 A to 400 A	1 A to 600 A	0.2 A to 1000 A	2 A to 2000 A ac rms	1 A to 3000 A
Accuracy	≤ 3 % +0.5 A 48 to 65 Hz	≤ 1 % +0.5 A 48 Hz to 65 Hz	2 % + 0.06 A 45 Hz to 400 Hz	.5 A to 40 A, 2 % + .015 A, 5 A to 400 A, 2 % + .04 A, 45 to 400 Hz	2 % 50 Hz to 1 kHz 10 A to 100 A: 2 %+0.5 A 100 A to 1000 A: 1 %+1 A 48 to 65 Hz	0.2 to 10 A: 3 %+0.1 A 10 A to 100 A: 2 %+0.5 A 100 A to 1000 A: 1 %+1 A 48 to 65 Hz	± 1 % of range 45 to 65 Hz Ranges: 20 A, 200 A, 2000 A*	1 to 30 A: 2 % + 0.1 A 1 to 300 A: 2 % + 0.5 A 1 to 3000 A: 2 % + 2 A 48 to 65 Hz
Bandwidth (–3 dB)	40 Hz to 40 kHz	40 Hz to 40 kHz	5 kHz to 20 kHz	5 Hz to 10 kHz	10 Hz to 50 kHz	5 Hz to 100 kHz	10 Hz to 20 kHz	10 Hz to 100 kHz
Maximum conductor diameter	20 mm (0.8 in)	20 mm (0.8 in)	32 mm (1.25 in)	32 mm (1.25 in)	50 mm (1.98 in)	54 mm (2.13 in)	177 mm (7 in)	64 x 100 mm (2.52 x 3.94 in)
Maximum conductor size	300 MCM	300 MCM	750 MCM	750 MCM	2–500 MCM or 1–1000 MCM	2–500 MCM or 1–1000 MCM	60 mm (24 in) circumference	610 mm or 915 mm
Output levels	1 mA/A	10 mV/A 100 mV/A	1 mA/A	10 mV/A 1 mV/A	1 mA/A 10 mV/A	1 mV/A 10 mV/A 100 mV/A	100 mV/A 10 mV/A 1 mV/A	10 mV/A 1 mV/A 0.1 mV/A
Output cable	1.5 m shrouded banana plugs	2 m to BNC termination	1.5 m shrouded banana plugs	2.5 m to BNC termination	1.2 m shrouded banana plugs	1.6 m to BNC termination	2 m with double shrouded banana plugs	2.1 m to BNC termination
Warranty	One-year	One-year	One-year	One-year	One-year	One-year	One-year	One-year
Safety rating	CAT III 600 V	CAT III 600 V	CAT III 1000 V CAT IV 600 V	CAT III 1000 V CAT IV 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V
Meter compatability	**AC range**							
10/11/12/ 12B/16/18		1 A to 200 A		1 A to 400 A		0.1 A to 1000 A*	4 A to 2000 A	1 A to 3000 A
110/111/112		3 A to 200 A		30 A to 400 A		3 A to 1000 A*	30 A to 2000 A	30 A to 3000 A
114/115/116/ 117	60 A to 200 A (115, 117 only)	1 A to 200 A ac	60 A to 400 A (115, 117 only)	0.6 A to 400 A ac*	60 A to 600A	0.2 A to 1000 A ac*	4 A to 2000 A ac	1 A to 3000 A ac
21/23/73/75/77 Series III	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.1 A to 1000 A*	4 A to 2000 A	1 A to 3000 A
26/79 Series III	1 A to 40 A	1 A to 200 A	1 A to 40 A and 200 A to 400 A	1 A to 400 A	1 A to 40 A and 200 A to 600 A	0.2 A to 1000 A*	4 A to 2000 A	2 A to 3000 A
27	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1A to 600 A	0.1 A to 1000 A*	4 A to 2000 A	1 A to 3000 A
70 Series III		1 A to 200 A		1 A to 400 A		0.1 A to 1000 s*	4 A to 2000 A	1 A to 3000 A
175/177/179	3 A to 200 A	1 A to 200 A	3 A to 400 A	3 A to 400 A*	3 A to 600 A	0.3 A to 1000 A*	4 A to 2000 A	3 A to 3000 A
1577/1587 Insulation Meter	3 A to 200 A	1 A to 200 A	3 A to 400 A	3 A to 400 A*	3 A to 600 A	0.3 A to 1000 A*	4 A to 2000 A	3 A to 3000 A
83-III, 83-V, 88V	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.1 A to 1000 A*	4 A to 2000 A	1 A to 3000 A
85/87 Series III 87 Series V	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.2 A to 1000 A*	4 A to 2000 A	2 A to 3000 A
87/89 Series IV 187/189	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.1 A to 1000 A*	4 A to 2000 A	1 A to 3000 A
8060A/8062A DMMs	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.2 A to 1000 A*	4 A to 2000 A	2 A to 3000 A
860 Series Graphical Multimeter	1 A to 200 A	1 A to 200 A	1 A to 400 A	1 A to 400 A	1 A to 600 A	0.3 A to 1000 A*	4 A to 2000 A	3 A to 3000 A
43B Power Meter		1 A to 200 A[1]		0.35 A to 400 A		0.1 A to 1000 A[1]	4 A to 2000 A[1]	1 A to 3000 A[1]
433/434 Power Quality		1 A to 200 A		1 A to 400 A		0.3 A to 1000 A	5 A to 2000 A	1.2 A to 3000 A
9X ScopeMeter		1 A to 200 A		1 A to 400 A		0.1 A to 1000 A	4 A to 2000 A	1 A to 3000 A
123/124 ScopeMeter		1 A to 200 A		1 A to 400 A		0.25 A to 1000 A	4.5 A to 2000 A	2.5 A to 3000 A
190 Series ScopeMeter		1 A to 200 A		1 A to 400 A		0.1 A to 1000 A	4 A to 2000 A	1 A to 3000 A
45 DMM	1.5 A to 100 A	1 A to 200 A	1.5 A to 100 A	1 A to 400 A	1.5 A to 100 A and 500 A to 600 A	0.15 A to 1000 A*	4 A to 2000 A	1.5 A to 3000 A
74X Series Process Calibrators		1.1 A to 200 A		1.1 A to 400 A		1.1 A to 1000 A*	11 A to 2000 A	11 A to 3000 A
787/789 ProcessMeter	50 A to 200 A	1 A to 200 A	50 A to 400 A	1 A to 400 A	50 A to 440 A	0.2 A to 1000 A*	4 A to 2000 A	2 A to 3000 A

[1] Current and watt readings will be multiples of 10 higher or lower than actual.
* Requires PM9081/001 or BP880 Adapters

AC only models

i200s

i400s

80i-600A

i1000s

i2000 flex

i3000s flex

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke current clamps

For use with DMMs, ScopeMeters and Power Quality Analyzers

AC/DC current clamp specifications

	80i-110s	i410	i1010	i30	i30s
DC range	0.1 A to 100 A	1 to 400 A	1 to 1000 A	4 mA to 20 A	4 mA to 20 A
AC range	0.1 A to 70 A	1 A to 400 A	1 A to 600 A	4 mA to 20 A rms	4 mA to 20 A rms
Accuracy	0.1 A to 10 A; dc to 1 kHz: ± 3 % + 50 mA; up to 100 A add 15 %; up to 20 kHz add 12 %	3.5 % + 0.5 A for dc or ac (45 to 400 Hz)	2 % + 0.5 A for dc or ac (45 to 400 Hz)	± 1 % ± 2 mA	± 1 % ± 2 mA
Bandwidth (-3 dB)	100 kHZ	3 kHz	10 kHz	dc to 20 kHz (-0.5 dB)	dc to 100 kHz (-0.5 dB)
Zero error adjustment	Yes	Yes	Yes	Yes	Yes
Maximum conductor diameter	11.8 mm (0.46 in)	30 mm (1.18 in)	30 mm (1.18 in)	19 mm (0.75 in)	19 mm (0.75 in)
Maximum conductor size	1 AWG	750 MCM or 2-500 MCM	750 MCM or 2-500 MCM	250 MCM	250 MCM
Output levels	10 mV/A, 100 mV/A	1 mV/A	1 mV/A	100 mV/A	100 mV/A
Output cable	1.6 meter with BNC termination	1.2 meter with shrouded banana plugs	1.2 meter with shrouded banana plugs	1.5 meter with shrouded dual banana plue	2 meter with BNC termination
Battery life	40 hours	60 hours	60 hours	30 hours	30 hours
Warranty	One-year	One-year	One-year	One-year	One-year
Safety	CAT II 600 V; CAT III 300 V	CAT III 600 V	CAT III 600 V	CAT III 300 V	CAT III 300 V

* Requires PM9081/001 Adapter
** Requires PM9082/001 Adapter

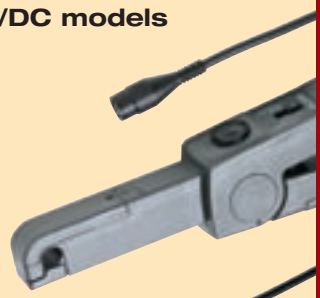
Power quality ac combo packs for 4-phase current measurements

Buy Combo Pack and Save

i430flex 4-pack

i5sPQ3

AC/DC models



80i-110s

i410

i1010

i30s and i30 Hall Effect AC/DC Current Clamps

- Use with multimeters or recorders for non-intrusive current measurements

New

i30s

i30

For more information and detailed specifications, go to www.fluke.com/accessories

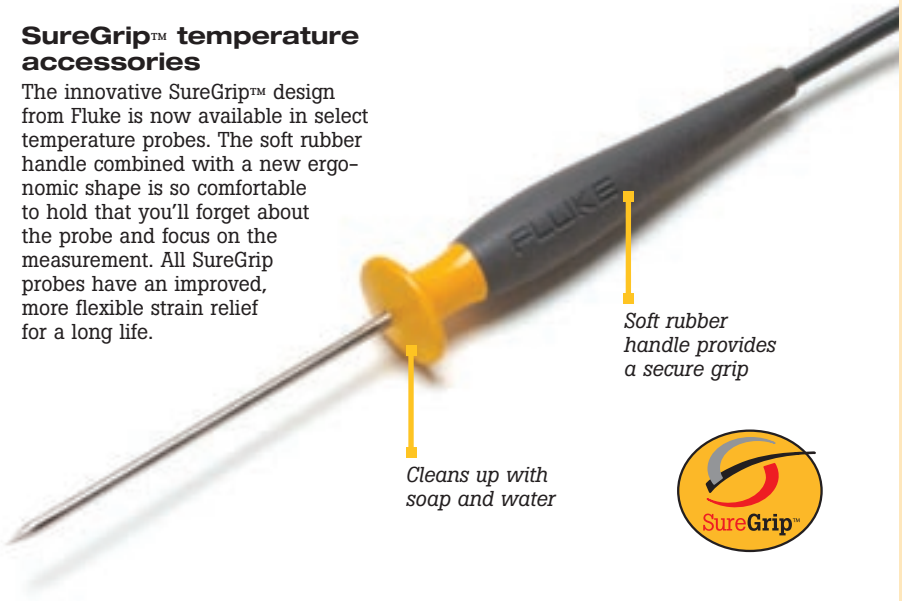
Residential
Industrial
Commercial
Electrical
HVAC/IAQ
Process
Electronic

Fluke temperature accessories

Hot probes with cool designs

SureGrip™ temperature accessories

The innovative SureGrip™ design from Fluke is now available in select temperature probes. The soft rubber handle combined with a new ergonomic shape is so comfortable to hold that you'll forget about the probe and focus on the measurement. All SureGrip probes have an improved, more flexible strain relief for a long life.



The right tool for the job

Make better temperature measurements with a probe designed for your application. The 80PK-8 pipe clamp probe (shown) is specifically designed for measuring pipe temperatures, calculating superheat and sub-cooling for refrigeration troubleshooting. Other special purpose probes shown are designed for making quick surface, fluid and air temperature measurements. The piercing probe makes it possible to make temperature measurements below the surface of a soft object. To enable your Fluke DMM or 50 Series II thermometer to make its' best possible measurements, chose the correct probe from the selection guide below.

	Bead	Bead	HVAC	Immersion	Surface	Air	Piercing	General purpose	Industrial surface	Pipe clamp
	80BK	80PK-1 80PJ-1	80PK-11	80PK-22	80PK-3A	80PK-24	80PK-25 80PT-25	80PK-26	80PK-27	80PK-8
Lowest temp	-40 °C (-40 °F)		-30 °C (-22 °F)	-40 °C (-40 °F)	0 °C (32 °F)	-40 °C (-40 °F)	K Type: -40 °C (-40 °F) T Type: -196 °C (-321 °F)	-40 °C (-40 °F)	-127 °C (-196 °F)	-29 °C (-20 °F)
Highest temp	260 °C (500 °F)		105 °C (221 °F)	1090 °C (1994 °F)	260 °C (500 °F)	816 °C (1500 °F)	350 °C (662 °F)	816 °C (1500 °F)	600 °C (1112 °F)	149 °C (300 °F)
Probe material	K type wire with teflon insulation		Velcro	Inconel 600	K type sensor with teflon body	Inconel	316 Stainless Steel	304 Stainless Steel		K type sensor with pvc body
Probe length	1 m Lead Wire		19 m Velcro cuff	21.27 cm (8.375 in)	9.525 cm (3.75 in)	21.59 cm (8.5 in)	10.16 cm (4 in)	21.57 cm (8.5 in)	20.32 cm (8 in)	for pipes from 6.4 mm (.25 in) to 34.9 mm (1.375 in)
Cable length	1 m (39 in)				1.3 m (4 ft)	1 m (39 in)				
Connection	Standard Banana Jack	Molded Thermocouple Plug								
SureGrip handle	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No
Key feature	Ideal for initial troubleshooting. Can be secured in place with a magnet.		Velcro probe allows hands free temperature measurement.	For use in liquids or in gels.	Exposed junction for direct contact with flat or slightly convex surfaces.	Perforated baffle for air and non-caustic gas measurements	Probe material safe for use in foods. Sharp tip pierces solid surfaces..	Use for general purpose air or surface measurements	Low conductivity stainless steel minimizes thermal shunting. Extra rugged.	Clamps securely to pipe. Measurements are repeatable to 0.56 °C (1 °F).
Thermocouple types	K	K, J	K	K			K, T	K		
Typical use										
General purpose	•	•	•	•	•	•	•	•	•	•
HVAC		•	•	•	•	•		•	•	•
Food service				•			•			
Industrial	•	•	•						•	•
Residential	•	•			•	•	•			•
Commercial	•	•	•	•	•	•	•	•	•	•

Use an 80AK adapter with meters with temperature function such as the 16, 78, 83V, 87V, 88V, 179, 187 and 189
The 80TK enables your meter to read temperature using mV (see the Accessory selection guide on page 60 for meters)
For the Fluke Thermometer, 51, 52, 53, and 54 III, no adaper is necessary for thermocouple types K, J, T and E

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke Temperature accessories

Turn your digital multimeter into a thermometer

Other temperature accessories

80TK Thermocouple Module
- Converts K-Type thermocouple signals into mV output
- Connects to DMM via standard banana plugs
- Switch selectable °C or °F
- Range: -50 °C to 1000 °C (-58 °F to 1832 °F)
- Includes 80PK-1 probe

80T-150U Universal Solid State Temperature Probe
- For measurement of air, surface and non-corrosive materials
- Measurement range: -50 °C to 150 °C (-58 °F to 302 °F)
- Output: 1 mV/°C or 1 mV/°F (switch selectable)
- Connects to DMM via standard banana plugs

80AK DMM Adapter
- Adapts K-type thermocouple mini-connector to dual banana plug inputs
- Compatible with all Fluke DMMs with temperature measurement functions
- Measurement range and accuracy is not affected by the 80AK adapter

80BK Integrated DMM Temperature Probe
- Compatible with all Fluke DMMs with temperature measurement functions
- K-Type thermocouple with standard banana jack
- Convenient one-piece construction
- Measurement range: -40 °C to 260 °C (-40 °F to 500 °F)

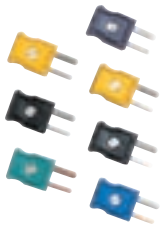
80CK-M and 80CJ-M Type K and J Male Mini-Connectors
- Isothermal screw terminal for K or J wire
- Suitable for up to 20 gauge thermocouple wire
- Color coded to industry standards (K-yellow, J-black)
- Two per package

80PJ-EXT, 80PK-EXT, 80PT-EXT Thermocouple Wire Extension Kits
For extending and repairing J, K or T-type thermocouple wires.
- Kit includes 3 m (approx. 9 ft.) of thermocouple wire and 1 pair of male/female mini-connectors
- Maximum continuous exposure temperature: 260 °C (500 °F)
- 80PK-EXT is compatible with K-type thermometers; 80PJ-EXT is designed for J-Type thermometers, and 80PT-EXT is designed for T-type thermometers

Thermocouple Plug Kits

700TC1
A kit of 10 mini-plug connectors. One each of the following:
Type J (black)
Type K (yellow)
Type T (blue)
Type E (purple)
Type R/S (green)
Type B or Cu (white)
Type L (J-DIN) (blue)
Type U (T-DIN) (brown)
Type C (red)
Type N (orange)

700TC2
A kit of 7 mini-plug connectors.
Type J (black), two
Type K (yellow), two
Type E (purple), one
Type T (blue), one
Type R/S (green), one



New!
80PR-60 RTD Temperature Probe
- Resistance temperature detector probe designed to add contact measurements to your Fluke 66 and 68 Non-Contact Infrared Thermometers
- Measurement range: -40 °C to 260 °C (-40 °F to 500 °F)
- 3.5 mm phono type jack is only appropriate for Fluke 66 and 68 Thermometers

Process tools accessories

BP7217
- NiCd rechargeable battery; nominal 7.2 volt, 1700 mA hr
- Use in 867B meters or 700 and 740 Series Calibrators

BP7235
- NiMH rechargeable battery; nominal 7.2 Volt, 3500 mA hr
- Use in 700 and 740 Series Calibrators

700LTP Low Pressure Test Pump
The Fluke 700LTP is designed to generate either vacuum to -12 psi/-.85 bar or pressures to 30 psi/2000 mbar. The Fluke 700 LTP is primarily intended for low pressure applications.

700ILF In-line Filter
The Fluke 700ILF can be used to isolate the calibrator from incidental contact with fluids. Particularly useful with the 718 calibrator to help keep moisture or oils from contaminating the on-board pump.

700PTP Pneumatic Test Pump
The 700PTP is a handheld pressure pump designed to generate either vacuum to -11.6 psi/-0.8 bar or pressure to 600 psi/25 bar.

700HTP Hydraulic Test Pump
The 700HTP is designed to generate pressures up to 10,000 psi/700 bar. Use the Fluke-700PRV adjustable relief valves to limit pressures to 1360 psi and 5450 psi.

700HTH Hydraulic Test Hose
The 700HTH is a 10,000 psi, 700 bar test hose that connects to a calibration unit under test from a Fluke 700HTP hydraulic test pump.

700PMP Pressure Pump
The 700PMP is a hand-operated pressure pump to provide pressures up to 150 psi/1000 kPa. Output fitting is 1/8 FNPT.

Fluke 700-IV Current Shunt
Conversion factor:
10 mV = 1 mA
Accuracy (% of input, 1 year): 0.025 %
Input current:
0 to 55 mA
Input resistance:
250 Ω nominal
Output resistance:
10 Ω nominal
Accuracy specification applies from +18 °C and 28 °C to 50 °C
Maximum input voltage:
30 V dc

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke cases and holsters

A premium meter deserves a premium case

	Premium cases		Soft cases							Hard cases	
	C520A	C510	C25	C50	C90	C12A	C125	C43	C789	C20	C101
	Genuine top grade leather cowhide.		Zippered carrying cases protect your meter; most cases come with belt loops so your meter is stored conveniently on your tool belt.							Tough polyprophylene cases hold and protect meters and accessories.	
Dimensions	22.5 cm x 7.0 cm x 4.8 cm (10 in x 3.125 in x 2.125 in)	20.3 cm x 11.3 cm x 5.1 cm (9 in x 5 in x 2.25 in)	19.2 cm x 11 cm x 5.6 cm (8.5 in x 4.9 in x 2.5 in)	16.9 cm x 8.5 cm x 3.4 cm (7.5 in x 3.75 in x 1.5 in)	19.2 cm x 7.9 cm x 5.6 cm (8 in x 3.5 in x 2.5 in)	15.1 cm x 11.3 cm x 3.4 cm (6.7 in x 5 in x 1.5 in)	23.7 cm x 13.5 cm x 5.6 cm (10.5 in x 6 in x 2.5 in)	30.4 cm x 19.7 cm x 6.7 cm (13.5 in x 8.75 in x 3 in)	27.0 cm x 22.5 cm x 6.7 cm (12 in x 10 in x 3 in)	22.5 cm x 13.5 cm x 9.0 cm (10 in x 6 in x 4 in)	30.5 cm x 36 cm x 10.5 cm (12 in x 14.2 in x 4.1 in)
DMMs											
10/11/12/12B		•				•					•
110/111/112		•		•	•	•	•				•
16		•		•	•	•	•				•
21/23/26/ 75/77/79		•	•		•		•				•
27			•							•	•
70/73 III		•	•		•		•				•
175/177		•	•		•		•				•
179		•	•		•		•				•
83/85/87 Series III		•	•				•	•			•
87/89 IV			•				•	•		•	•
83/87 Series V			•				•	•		•	•
187/189			•				•	•		•	•
867B									•		
Clamp meters											
321/322			•								
Insulation testers											
1503/1507 1577/1587			•								•
Thermometers											
50S/50D		•	•	•	•						•
51/52/53/54 Series II		•	•	•	•						•
61			•								
65		•		•	•						
Electrical testers											
T3/T5	•										
7-600/7-300				•		•					•
ScopeMeters											
123/124							•	•	•		•
Power quality											
39/41B								•	•		
Process tools											
705/707											•
712/713							•				•
714/715/716/717			•								•
725			•				•			•	•
741/743/744								•	•		
787		•	•				•	•			•
789			•				•	•	•	•	•

C1600 Meter and Accessories Gear Box

This rugged, molded plastic case will carry Fluke digital multimeters, process calibrators and most Fluke accessories used for these meters.

- Deep interior large enough to hold and protect your gear
- Rubber gasket in lid seals out dust and keeps contents dry
- Lift out tray keeps everything organized

C550 Tool Bag

- Steel reinforced frame
- Rugged ballistic cloth with heavy duty hardware
- Large zippered storage compartment with 25 pockets
- Weather resistant
- Carry all your tools to the job

C75 Accessory Case

- Zippered carrying case with two inside pockets
- Carry test lead sets or probes

H6 Infrared Thermometer Holster

- Durable nylon construction protects your thermometer while keeping it within reach
- For Fluke 63, 66 and 68 Infrared Thermometers

H5 Electrical Tester Holster

- Rugged fabric holster includes flap for lead storage and built-in belt loop
- Fits Fluke T3 and T5 testers

H3 Clamp Meter Holster

- Rugged fabric holster includes flap for lead storage and built-in belt loop
- For Fluke 320 and 330 Series Clamp Meters

For more information and detailed specifications, go to www.fluke.com/accessories

Fluke holsters and fuses

Take care of your test tools—inside and out

Protective meter holsters

C10 Meter Holster
- Snap on yellow holster absorbs shocks and protects meter from rough handling
- Fits Fluke 10 Series DMMs

C70Y Meter Holster
- Snap on yellow holster absorbs shocks and protects meter from rough handling
- Flex-Stand™ allows meter to hang, lean or stand for convenience and best viewing
- For Fluke 70 and 73 Meters

H80M Protective Holster with magnetic strap
- Snap on holster absorbs shocks and protects meter from rough handling
- Magnetic strap solution makes it easy to hang your meter for hands free work
- For Fluke 80 Series DMMs, 710 Series and 787 calibration tools

ToolPak™ Magnetic Meter Hanging Solution

- Free both hands to make measurements
- Hang your meter from metallic surfaces like panels and pipes
- Kit includes universal hanger clips (two), hook and loop straps (two lengths), adapter and strong magnet
- Attaches to back of many Fluke meters, including 110, 170, 180 Series, 87V and 83V DMMs, 724, 725 and 789 Process Calibrators, 70 Series III DMMs, 1503, 1507, 1577 and 1587 Insulation Multimeters and 50 Series II Digital Thermometers

Fuse selection guide

Replacement fuses for Fluke DMMs are available from your distributor in 440 mA, 500 mA, 630 mA, 1 A, 2 A, 3 A, 11 A, and 15 A values. To order direct from Fluke call 1-888-99-FLUKE (U.S.) or contact your distributor.

Model	Fuse requirements
21/23/75/77-II	P/N 871173; 630 mA 250V fuse P/N 892583; 15 A 600 V fuse
21-III/75-III 73-III	P/N 871173; 630 mA 250 V fuse P/N 803293 11 A 1000 V fuse
76/29/79-II 83/85/87/88 (S/N < 65650001)	P/N 871207; 1 A 600 V fuse P/N 892583; 15 A 600 V fuse
25/27 (S/N < 7247001)	P/N 871173; 630 mA 250 V fuse P/N 871202; 3A 600 V fuse P/N 892583; 15A 600 V fuse
27 (S/N >7247001)	P/N 943121; 440 mA 1000 V fuse P/N 803293; 11A 1000 V fuse
45 (S/N < 7211001)	P/N 871181; 500 mA 250 V fuse P/N 892583; 15 A 600 V fuse
45 (S/N > 7211001)	P/N 871181; 500 mA 250 V fuse P/N 943121; 440 mA 1000 V fuse P/N 803293; 11 A 1000 V fuse
73 and 73-II	P/N 892583; 15 A 600 V fuse
863/865/867/867B 83/85/87 (S/N > 65650001) 87-IV/89-IV/187/189/ 83-III/85-III/87-III/87E-III/83V/87V 23-III/77-III/26-III/79-III/175/177/179	P/N 943121; 440 mA 1000 V fuse P/N 803293; 11 A 1000 V fuse
111/112	P/N 803293; 11 A 1000 V fuse
712/713/714/715/716/717/718	P/N 686527; 125 mA 250 V fuse
724/725	P/N 2002234 (qty. 1); 50 mA 250 V fuse
1577/1587	P/N 943121; 440 mA 1000 V fuse
1503/1507	P/N 2279339; 315 mA, 1000 V fuse

For more information and detailed specifications, go to www.fluke.com/accessories

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- Safe on rubber
- Safe to the environment
- Comes in two sizes: 6-pack (MC6) and 50-pack (MC50)

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- IntelliTone digital processing eliminates noise and false signals
- New SmartTone™ analog toning precisely isolates individual wire pairs
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- Verifies twisted-pair installation with visual end-to-end continuity test
- Identifies, diagnoses, and troubleshoots datacom/telecom services

Test the integrity of UTP, Coax, phone and security cabling using known standards.

MicroScanner Pro
- The essential cable verification tester
- Measures length and distance to fault via true TDR (Time Domain Reflectometry)
- Pinpoints opens, shorts, reversed, crossed and split pairs
- Tests UTP, STP and coax cables
- Flashes hub and switch port lights
- Identifies active networking hubs and detects speed/duplex settings
- Analog tone generator with four song selections

MicroMapper

- The fast, comprehensive LAN wiremap checker
- Tests twisted-pair cables for opens, shorts, crossed pairs, split pairs, or any miswires
- Verifies correct pin outs, wiremap

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What's New from Fluke

The new products to help keep you up and running

Fluke Ti20 Thermal Imager

The Fluke Ti20 Thermal Imager is an unbeatable solution for predictive maintenance and troubleshooting.

- Includes unlimited-use InsideIR™ companion software and professional training materials.
- Designed for industrial use. IP54-rated for use in dust and moisture filled environments.
- Follow easy, on-camera instructions each time you perform inspections (simply point, focus and pull the trigger) for fast and easy inspection routing.

For more information, see page 48.

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The Fluke 117 is one of four new compact digital multimeters. Choose from models specifically designed for Commercial Electricians, HVAC/R Technicians and Field Service Technicians. Engineered by you, designed by Fluke.

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- AutoVolt feature for automatic ac/dc voltage selection.
- LoZ: low input impedance prevents false readings due to "ghost voltage".

For more information, see page 17.

Fluke 975 AirMeter™

The Fluke 975 AirMeter test tool raises indoor air monitoring to the next level by combining five powerful tools in one, rugged and easy-to-use handheld device.
The Fluke 975 measures:

- Temperature
- Relative Humidity
- Air Velocity
- CO_2
- CO

For more information see page 54.

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- 10 ohm to 1 Gohm resistance
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- RS-232, IEEE-488 and LAN interfaces

For more information, see page 21.

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

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