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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: 6737-2822
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

Fluke 1AC II VoltAlert Voltage Detector
- Non-contact voltage detection on electrical circuits
- Detecting voltage before work begins
See page 22 for details

Fluke 116 Digital Multimeter
- Measures volts, ohms, capacitance and temperature
- Resistance and continuity
- 600 V ac and dc measurement range
See page 18 for details

Fluke 6 Mini IR Thermometer
- 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
- 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
- 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
- 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

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

Fluke 975 AirMeter™
- Best suited for: Optimizing HVAC ventilation settings for ASHRAE 62 recommendations
  - Simultaneously measures, logs and displays temperature, humidity, velocity, CO₂ 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

**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.

**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.
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](http://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

**Electrical Measurement Safety Program**
[www.fluke.com/safety](http://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](http://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.

**Fluke Education Partnership Program**
[www.fluke.com/education](http://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.

**Application Notes**
[www.fluke.com/appnotes](http://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/fluenews](http://www.fluke.com/fluenews)

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 Test Tool Information**
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.

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 Electrotechnical 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 damps 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.

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 TÜV-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](http://www.fluke.com/safety)
Fluke customer support is ready to help

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.
# Digital Multimeter Selection Guide

## Models

<table>
<thead>
<tr>
<th>Features</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest accuracy with data logging</td>
<td>189</td>
</tr>
<tr>
<td>Industrial troubleshooting</td>
<td>129</td>
</tr>
<tr>
<td>True-rms and built-in thermometer</td>
<td>119</td>
</tr>
<tr>
<td>Designed for building maintenance</td>
<td>112</td>
</tr>
<tr>
<td>Designed for HVAC/R technicians</td>
<td>116</td>
</tr>
<tr>
<td>Waterproof and chemical resistant</td>
<td>27</td>
</tr>
<tr>
<td>Two powerful tools in one</td>
<td>1587</td>
</tr>
<tr>
<td>4-20 mA loop diagnostics</td>
<td>789</td>
</tr>
</tbody>
</table>

## Basic Features

- True-rms readings
  - AC/DC
  - AC
  - AC
  - AC
- Basic dc accuracy
  - 0.025 %
  - 0.05 %
  - 0.09 %
  - 0.5 %
- 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
  - 3-1/2
- Counts
  - 50,000
  - 20,000
  - 6,000
  - 6,000
  - 6,000
  - 3,200
  - 6,000
  - 4,000

## Measurements

- **Voltage ac/dc**
  - 1000 V
  - 1000 V
  - 1000 V
  - 1000 V
- **Current ac/dc**
  - 10 A
  - 10 A
  - 10 A
  - 10 A
- **Resistance**
  - 500 MΩ
  - 50 MΩ
  - 50 MΩ
  - 40 MΩ
- **Frequency**
  - 1 MHz
  - 200 kHz
  - 100 kHz
  - 50 kHz
- **Capacitance**
  - 50 mF
  - 10 mF
  - 10 mF
  - 10 mF
- **Temperature**
  - +1350 °C
  - +1090 °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**
  - *
  - Readings memories
    - 100
    - with PC
- **Other features**
  - Automatic selection, LoZ
    - *
  - Isolation 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
    - *
  - 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 II measurements
  - 1000 V
  - 1000 V
  - 1000 V
  - 600 V
  - 600 V
  - 600 V
  - 1000 V
  - 1000 V
  - 1000 V
- CAT IV measurements
  - 600 V
  - 600 V
  - 600 V
  - 600 V
  - 600 V
  - 600 V
  - 600 V

See page

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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

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

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

<table>
<thead>
<tr>
<th>Function</th>
<th>8060</th>
<th>189</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built-in recorder with time stamp</td>
<td>No</td>
<td>Yes</td>
<td>Record and view intermittent problems without a chart recorder</td>
</tr>
<tr>
<td>PC interface</td>
<td>No</td>
<td>Yes, software optional</td>
<td>Transfer readings to a PC for analysis and documentation</td>
</tr>
<tr>
<td>Built-in thermometer</td>
<td>No</td>
<td>Yes, probe optional</td>
<td>No need to carry a separate thermometer</td>
</tr>
<tr>
<td>Capacitance</td>
<td>No</td>
<td>5 nF to 50,000 pF</td>
<td>Measure capacitors with one tool</td>
</tr>
<tr>
<td>V dc and V ac resolution</td>
<td>10 pV</td>
<td>1 pV</td>
<td>Precise measurements in a handheld tool</td>
</tr>
<tr>
<td>div and dimm</td>
<td>Yes</td>
<td>Yes</td>
<td>Measure communication circuits</td>
</tr>
<tr>
<td>Duty cycle and pulse width</td>
<td>No</td>
<td>Yes</td>
<td>Measure control circuits</td>
</tr>
<tr>
<td>In-line current</td>
<td>2 A</td>
<td>10 A, 1000 V fuse</td>
<td>Safely measure five times more current</td>
</tr>
<tr>
<td>Relative offset</td>
<td>No</td>
<td>Yes</td>
<td>Remove test lead resistance See small signal variations</td>
</tr>
<tr>
<td>Range selection</td>
<td>Manual, 8 switches</td>
<td>Auto/Manual range</td>
<td>Simpler to use, more durable</td>
</tr>
<tr>
<td>Peak capture, MIN/MAX</td>
<td>No</td>
<td>250 µS</td>
<td>Record intermittent problems</td>
</tr>
<tr>
<td>Backlight</td>
<td>No</td>
<td>2-level, bright white</td>
<td>Easier to read in dark locations</td>
</tr>
<tr>
<td>Holster</td>
<td>No</td>
<td>Integrated overmold</td>
<td>Stands up to accidental drops</td>
</tr>
<tr>
<td>Magnetic hanger</td>
<td>No</td>
<td>Optional TPAK</td>
<td>Position meter for easy viewing</td>
</tr>
<tr>
<td>CAT electrical safety rating</td>
<td>No</td>
<td>Yes, 2nd edition ANSI and IEC 61010</td>
<td>Increased protection from 8 kV spikes that can cause arc flash</td>
</tr>
<tr>
<td>Battery door</td>
<td>No</td>
<td>Yes</td>
<td>Change battery quickly without breaking cal seal</td>
</tr>
<tr>
<td>Warranty</td>
<td>Expired</td>
<td>Limited lifetime</td>
<td>Lower cost of ownership</td>
</tr>
</tbody>
</table>

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

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

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

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

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

Digital Multimeters 11
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! 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
- TPAX™ 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

### Specifications - 189 and 187 DMMs

<table>
<thead>
<tr>
<th>Function</th>
<th>Range and resolution</th>
<th>Best accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>V dc</td>
<td>50.000 mV, 500.00 mV, 3000.0 mV, 5.000 V, 50.00 V, 500.0 V, 1000.0 V</td>
<td>± 0.025 %</td>
</tr>
<tr>
<td>V ac</td>
<td>50.000 mV, 500.00 mV, 3000.0 mV, 5.000 V, 50.00 V, 500.0 V, 1000.0 V</td>
<td>± 0.4 %</td>
</tr>
<tr>
<td>A dc</td>
<td>500.00 µA, 5.000 µA, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A</td>
<td>± 0.15 %</td>
</tr>
<tr>
<td>A ac</td>
<td>500.00 µA, 5.000 µA, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A</td>
<td>± 0.75 %</td>
</tr>
<tr>
<td>Resistance</td>
<td>500.00 Ω to 500.0 MΩ</td>
<td>± 0.05 %</td>
</tr>
<tr>
<td>Capacitance</td>
<td>1.000 nF to 50.00 mF</td>
<td>± 1.00 %</td>
</tr>
<tr>
<td>Frequency</td>
<td>50.00 Hz, 1.000 kHz, 50.000 kHz, 999.99 kHz</td>
<td>± 0.005 %</td>
</tr>
<tr>
<td>Temperature</td>
<td>-200 °C to 1350 °C (-328 °F to 2462 °F)</td>
<td>± 1 % of reading</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>10 % to 90 %, resolution 0.01 %</td>
<td>–</td>
</tr>
<tr>
<td>Pulse width</td>
<td>2 ranges, 499.99 ms and 999.9 ms, best resolution 0.01 ms</td>
<td>3 %</td>
</tr>
<tr>
<td>dBM, dVR</td>
<td>-62 to +60, resolution 0.01 dB</td>
<td>0.1 dB</td>
</tr>
</tbody>
</table>

*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)

### Included accessories

Every 180 series meter comes packaged with TL71 Silicone Test Leads, probe holders, two ACT72 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
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

A single graph overlaying two time periods makes analysis easier.

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

Fluke 189, 189/FVF2 Kit and 187 capabilities

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

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

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

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

Features - 87V and 83V DMMs

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

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
- 80K K-type temperature probe

Included accessories

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

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
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 and 179 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.

Specifications – 179, 177 and 175 DMMs

<table>
<thead>
<tr>
<th>Feature</th>
<th>179</th>
<th>177</th>
<th>175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max voltage</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>True-rms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic dc accuracy</td>
<td>0.09 %</td>
<td>0.09 %</td>
<td>0.15 %</td>
</tr>
<tr>
<td>Backlight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min/Max/Avg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ToolPak meter hanging kit with magnet</td>
<td>Opt</td>
<td>Opt</td>
<td>Opt</td>
</tr>
</tbody>
</table>

1All ac voltage and ac current ranges are specified from 5 % of range to 100 % of range. 210 A continuous, 20 A for up to 30 seconds.
3Voltage frequency is specified from 2 Hz to 100 kHz. Current Frequency is specified from 2 Hz to 30 kHz.

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 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
- TL224 SureGrip™ Silicone Test Leads resist heat
- AC220 SureGrip™ Heavy Duty Hook Clips
- 80Bk K-type temperature probe
- ToolPak™ meter hanging accessory to hold meter to steel surfaces

Recommended accessories – 179, 177 and 175 DMMs

L100 Probe Extender with light
TL220 SureGrip Industrial Test Lead Set
C530 Carrying Case
PV200 Pressure-Vacuum Module
1400s AC Current Clamp

For more information and detailed specifications, go to www.fluke.com/dmm
# Fluke Family of True-rms Digital Multimeters

Engineered by Fluke for working professionals

## Commercial electricians

<table>
<thead>
<tr>
<th>Fluke 112</th>
<th>New</th>
<th>Fluke 117</th>
<th>HVAC/R technicians</th>
<th>Fluke 116</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Fluke 112" /></td>
<td>Fluke 12, 16</td>
<td>New</td>
<td><img src="image2.png" alt="Fluke 12, 16" /></td>
<td>Fluke 116</td>
</tr>
<tr>
<td>• VoltAlert™ non-contact voltage detection</td>
<td>• Temperature to 400 °C</td>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td>• Resistance, continuity, frequency and capacitance</td>
<td></td>
</tr>
<tr>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td>• Resistance, continuity, frequency and capacitance</td>
<td>• AC/DC voltage to 600 V, ac/dc current to 10 A</td>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td></td>
</tr>
<tr>
<td>• Resistance, continuity, frequency and capacitance</td>
<td>• AC/DC voltage to 600 V, ac/dc current to 600 µA</td>
<td>• AC/DC voltage to 600 V, ac/dc current to 10 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## HVAC/R technicians

<table>
<thead>
<tr>
<th>Fluke 116</th>
<th>• Temperature to 400 °C</th>
<th>• Resistance, continuity, frequency and capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td>• AC/DC voltage to 600 V, ac/dc current to 600 µA</td>
<td></td>
</tr>
</tbody>
</table>

## Field service technicians

<table>
<thead>
<tr>
<th>Fluke 110, 111</th>
<th>New</th>
<th>Fluke 115</th>
<th>Basic electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Fluke 110, 111" /></td>
<td>Fluke 7-600</td>
<td><img src="image4.png" alt="Fluke 7-600" /></td>
<td>New</td>
</tr>
<tr>
<td>• Resistance, continuity, frequency and capacitance</td>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td>• Resistance and continuity</td>
<td></td>
</tr>
<tr>
<td>• AC/DC voltage to 600 V</td>
<td>• AC/DC voltage to 600 V</td>
<td>• AC/DC voltage to 600 V</td>
<td></td>
</tr>
<tr>
<td>• AC/DC current to 10 A</td>
<td>• AC/DC current to 10 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Basic electrical

<table>
<thead>
<tr>
<th>Fluke 114</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>• LoZ low impedance input for safer troubleshooting</td>
<td>• AC/DC voltage to 600 V</td>
</tr>
</tbody>
</table>

## Specifications

### Basic features

<table>
<thead>
<tr>
<th>114</th>
<th>115</th>
<th>116</th>
<th>117</th>
</tr>
</thead>
<tbody>
<tr>
<td>True-rms readings</td>
<td>ac</td>
<td>ac</td>
<td>ac</td>
</tr>
<tr>
<td>Basic dc accuracy</td>
<td>0.5 %</td>
<td>0.5 %</td>
<td>0.5 %</td>
</tr>
<tr>
<td>Counts</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
</tr>
</tbody>
</table>

### Measurements

| Voltage ac/dc | 600 V | 600 V | 600 V | 600 V |
| Current ac/dc | 10 A | 10 A | 10 µA | 10 µA |
| 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

Digital Multimeters
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 range of electrical and electronic testing applications.

The 115 features include:
- Large display and white LED backlight to work in poorly lit areas more effectively
- Compact ergonomic design for one-handed operation
- Min/Max/Average to record signal fluctuations
- Resistance, continuity, frequency and capacitance

### Specifications - 117 and 115 DMMs

<table>
<thead>
<tr>
<th>Function</th>
<th>117</th>
<th>115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volts ac/dc</td>
<td>600 V</td>
<td>0.5 % ± 2</td>
</tr>
<tr>
<td>Current ac/dc</td>
<td>10 A</td>
<td>1.0 % ± 3</td>
</tr>
<tr>
<td>Resistance</td>
<td>40 MΩ</td>
<td>0.9 % ± 2</td>
</tr>
<tr>
<td>Capacitance</td>
<td>1 nF to 9,999 µF</td>
<td>1.9 % ± 2</td>
</tr>
<tr>
<td>Frequency</td>
<td>5 Hz to 50 kHz</td>
<td>0.1 % ± 2</td>
</tr>
<tr>
<td>Diode</td>
<td>2 V</td>
<td>0.9 % ± 2</td>
</tr>
</tbody>
</table>

### Features - 117 and 115 DMMs

- VoltAlert™
- AutoVolt/LoZ
- Analog bargraph
- Large backlit digital display
- True-rms for accurate display on non-linear loads
- Min/Max recording
- Display hold
- 3½ digits
- 6000 counts
- CAT III 600 V safety rated
- Large display and white LED backlight
- AutoVolt feature
- Min/Max/Average to record signal fluctuations
- Resistance, continuity, frequency and capacitance

### 117/322 Electrician’s Combo Kit
- 117 True-rms digital multimeter with non-contact voltage detection
- New! C119 Deluxe carrying case with shoulder strap
- 322 Compact clamp meter
- TL75 Hard Point Test Lead Set
- ToolPak Magnetic Meter Hanging Strap

### 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

For more information and detailed specifications, go to www.fluke.com/dmm
Fluke 116 and 114 Digital Multimeters

Designed for HVAC/R technicians and electrical troubleshooting

Fluke 116

The Fluke 116 was specifically designed for the HVAC professional. It has everything needed in 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 ghost voltage
- Large white LED backlight to work in poorly lit areas
- Compact ergonomic design for one-handed operation
- Resistance, continuity, frequency and capacitance

Features - 116 and 114 DMMs

<table>
<thead>
<tr>
<th>Feature</th>
<th>116</th>
<th>114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature measurements</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>AutoVolt/LoZ</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Analog bargraph</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Large backlit digital display</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>True-rms for accurate measurements on non-linear loads</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Min/Max recording</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Display hold</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2 1/2 digits</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6000 counts</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>CAT III 600 V safety rated</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Specifications - 116 and 114 DMMs

<table>
<thead>
<tr>
<th>Function</th>
<th>Range and resolution</th>
<th>Best accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volts ac/dc</td>
<td>600 V</td>
<td>0.5 % + 2</td>
</tr>
<tr>
<td>Current ac/dc</td>
<td>10 A</td>
<td>0.5 % + 3</td>
</tr>
<tr>
<td>Temperature</td>
<td>+400 °C</td>
<td>1.0 % + 18</td>
</tr>
<tr>
<td>Resistance</td>
<td>50 kΩ</td>
<td>0.5 % + 2</td>
</tr>
<tr>
<td>Capacitance</td>
<td>1 nF to 8,999 µF</td>
<td>1.0 % + 2</td>
</tr>
<tr>
<td>Frequency</td>
<td>5 Hz to 50 kHz</td>
<td>0.1 % + 2</td>
</tr>
<tr>
<td>Tach (116 only)</td>
<td>2 V</td>
<td>0.5 % + 2</td>
</tr>
</tbody>
</table>

Recommended accessories – 116 Digital Multimeter

- 80AK: DMM Adapter
- 80PK-24: SureGrip Air Temperature Probe
- 80PK-S: Pipe Clamp Temperature Probe
- 80PK: Integrated DMM Temperature Probe

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

Ordering information

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

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

Included accessories

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

Digital Multimeters
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

**Recommended accessories – 77-IV Digital Multimeter**

- **H400s 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 Specifications**

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

---

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 seal 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

**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

---

**Fluke 27 included accessories**

TL75 test leads, 9 V battery (installed) and manual.

**Fluke 77-IV 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
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

Features - 88V and 73 DMMs

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

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)

Recommended automotive accessories – 88V DMM

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP81 or TP62 Insulation Piercing Probes</td>
<td>63</td>
</tr>
<tr>
<td>TP94 Oxygen Sensor Insulation Piercing Probe</td>
<td>63</td>
</tr>
<tr>
<td>TP58 Rigid Backprobe Pin Set</td>
<td>63</td>
</tr>
<tr>
<td>TP40 Automotive Back Probe Pin Set</td>
<td>63</td>
</tr>
</tbody>
</table>

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

Digital Multimeters
Fluke 8845A and 8846A 6.5 Digit Precision Multimeters

Precision and versatility for bench or systems applications

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.

**Features – 8845A and 8846A**

<table>
<thead>
<tr>
<th>Feature</th>
<th>8845A</th>
<th>8846A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>Dual VFD Dot Matrix</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>6.5 Digits</td>
<td></td>
</tr>
<tr>
<td>Continuity / Code Test</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Analytical Functions</td>
<td>Statistics, Histogram, TrendPlot®, Limit Test</td>
<td></td>
</tr>
<tr>
<td>Math Functions</td>
<td>Zero, Min/Max/Average, Std Dev; mx + h, dB/dBm</td>
<td></td>
</tr>
<tr>
<td>USB Device Port</td>
<td>–</td>
<td>USB memory drive port</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS-232, IEEE-488, Ethernet, USB (with optional adapter)</td>
<td></td>
</tr>
<tr>
<td>Programming Languages/Emulation Modes</td>
<td>SCPI (IEEE-488.2), Agilent 34401A, Fluke 45</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>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</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications – 8845A and 8846A**

<table>
<thead>
<tr>
<th>Function*</th>
<th>8845A</th>
<th>8846A</th>
<th>8845A</th>
<th>8846A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage ac</td>
<td>1000 V</td>
<td>100 kV</td>
<td>1000 V</td>
<td>100 kV</td>
</tr>
<tr>
<td>Voltage ac (freq. 300 Hz)</td>
<td>100 V</td>
<td>1000 µV</td>
<td>100 V</td>
<td>1000 µV</td>
</tr>
<tr>
<td>Voltage ac (2x4 wire)</td>
<td>100 µV</td>
<td>10 µµV</td>
<td>100 µV</td>
<td>10 µµV</td>
</tr>
<tr>
<td>Current dc</td>
<td>10 A</td>
<td>100 µA</td>
<td>10 A</td>
<td>100 µA</td>
</tr>
<tr>
<td>Current ac (freq. 3 Hz to 10 kHz)</td>
<td>1 A</td>
<td>1 µA</td>
<td>1 A</td>
<td>1 µA</td>
</tr>
<tr>
<td>Frequency</td>
<td>1 MHz</td>
<td>1 kHz</td>
<td>1 MHz</td>
<td>1 kHz</td>
</tr>
<tr>
<td>Capacitance</td>
<td>1 nF</td>
<td>1 µF</td>
<td>1 nF</td>
<td>1 µF</td>
</tr>
<tr>
<td>Temperature RTD</td>
<td>–</td>
<td>–</td>
<td>–20 °C to +60°C</td>
<td>0.001°</td>
</tr>
</tbody>
</table>

*Accuracy = ± (% of reading)

**Included accessories**


**Ordering information**

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

**Recommended accessories – 8845A and 8846A Precision Multimeters**

- TL244W-PT 2x4 Wire Ohms Test Lead 2 mm probe tip
- TL244W-TWE 2x4 Wire Ohms Tweezers
- FVF-UG FlukeView Forms Software Upgrade
- 884X-512M USB Memory 512M

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

**Digital Multimeters**
Fluke T5 and T3 Electrical Testers

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

<table>
<thead>
<tr>
<th></th>
<th>T5-1000</th>
<th>T5-400</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure dc voltage</td>
<td>1000 V</td>
<td>600 V</td>
<td>Preset 6 V, 12 V, 24 V, 36 V, 48 V, 110 V and 220 V**</td>
</tr>
<tr>
<td>Measure ac voltage</td>
<td>1000 V</td>
<td>600 V</td>
<td>Preset 24 V, 48 V, 120 V, 208 V, 240 V, 277 V and 480 V*</td>
</tr>
<tr>
<td>Measure ac current (average)</td>
<td>100 A</td>
<td>100 A</td>
<td>N/A</td>
</tr>
<tr>
<td>Measure continuity</td>
<td>&lt; 25 Ω</td>
<td>&lt; 25 Ω</td>
<td>&lt; 20,000 Ω</td>
</tr>
<tr>
<td>Measure resistance</td>
<td>1000 Ω</td>
<td>1000 Ω</td>
<td>N/A</td>
</tr>
<tr>
<td>DC polarity indicator</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Detachable probe tips with optional probe tips styles</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Safety rating</td>
<td>1000 V Overvoltage CAT III</td>
<td>600 V Overvoltage CAT III</td>
<td>1000 V Overvoltage CAT III</td>
</tr>
<tr>
<td>Warranty</td>
<td>Two-years</td>
<td>Two-years</td>
<td>One-year</td>
</tr>
</tbody>
</table>

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

Recommended accessories – Electrical Testers

H5 Electrical Tester Holster
AC288 (T3) SureStrip™ Alligator Clips
Meter Cleaner Cleaning Wipes
T5 Kit Starter Kit
CS20A Leather Tool Case

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

<table>
<thead>
<tr>
<th></th>
<th>T5-1000</th>
<th>T5-400</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1000 V Voltage, Continuity and Current Tester</td>
<td>600 V Voltage, Continuity and Current Tester</td>
<td>Voltage and Continuity Tester</td>
</tr>
<tr>
<td>T5-H5-1AC Kit Voltage, Continuity and Current Tester Kit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T3-1AC Kit Voltage and Continuity Tester Kit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1AC-II 5PK VoltAlert S Pack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1AC-II Voltage Detector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9040 Rotary Field Indicator</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Electrical Testers

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 HS Holster

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

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

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

<table>
<thead>
<tr>
<th>Feature</th>
<th>1625</th>
<th>1623</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-button measurement concept</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>3- and 4-pole earth ground measurement</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>4-Pole soil resistivity testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Pole resistance measurement ac</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>2-and 4-pole resistance measurement dc</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Selective testing, no disconnection of ground conductor (1 clamp)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Stakeless testing, quick ground loop testing (2 clamps)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Measuring frequency 128 Hz</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Earth impedance measurement at 95 Hz</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Automatic frequency control (AFC) (94 Hz to 128 Hz)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Measuring voltage switchable 20/48V</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Programmable limits, settings</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Continuity with buzzer</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Dust/water resistance</td>
<td>IP56</td>
<td>IP56</td>
</tr>
<tr>
<td>Safety rating</td>
<td>CAT II 300 V</td>
<td>CAT II 300 V</td>
</tr>
</tbody>
</table>

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

### 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.

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

Earth Ground Testers
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

For more information and detailed specifications, go to [www.fluke.com/pq](http://www.fluke.com/pq)

### Features - 435 and 434 PQ Analyzers

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

*Optional functionality can be added with upgrade kit.

### Recommended accessories – 435 and 434 PQ Analyzers

- **15A-PQ:** 3 pack of 5 A precision current clamps
- **1430-flex-5ph:** 4 pack of 3000 A flexible current probes
- **C435:** Water-tight hard case with rollers
- **G50360:** 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
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

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.

### Specifications – 43B Analyzer

<table>
<thead>
<tr>
<th>Function</th>
<th>Fluke 43B*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volts/Amps/Hz</td>
<td>± (1 % + 10 counts)</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>± (+0.5 % + 2 counts)</td>
</tr>
<tr>
<td>Crest Factor (CF)</td>
<td>± (5 % + 1 count)</td>
</tr>
<tr>
<td>Sags and swells</td>
<td>± (2 % +10 counts)</td>
</tr>
<tr>
<td>Power</td>
<td>± (2 % + 6 counts)</td>
</tr>
<tr>
<td>Harmonics and THD</td>
<td>± 3 %</td>
</tr>
<tr>
<td>Transient display</td>
<td>± 3 %</td>
</tr>
<tr>
<td>Minimum transient detection</td>
<td>40 ns</td>
</tr>
<tr>
<td>Inrush current</td>
<td>± 5 % of full scale</td>
</tr>
</tbody>
</table>

**Additional capabilities**

- AutoTrend
- Real time scope
- Ohms, diode, continuity, capacitance
- Memory (screens/data) 20 (screens, settings, data)
- FlukeView software and interface cable Standard

**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 proof)

**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

**Warranty:** Three-years on Fluke 43B, one-year on accessories

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

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

### 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

### Power Quality Analyzers
Fluke 1760 Power Quality Recorder Topas

Fluke 1650 RPM Power Recorder

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

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 standard, 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

Fluke 1650 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 complex analyses, Fluke 1650 delivers the power and flexibility to get the results you need.

- 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 complex analyses, Fluke 1650 delivers the power and flexibility to get the results you need.

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

Application note, literature code 255030:
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.

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-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.

Power Quality Analyzers
Fluke 1740 Series Three-Phase PQ Loggers Memobox

Assess power quality and conduct long-term studies with ease

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**

<table>
<thead>
<tr>
<th>Features</th>
<th>1745</th>
<th>1746</th>
<th>1743</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement of common power parameters: V, A, W, VAR, PF, energy, flicker, voltage events, and THD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement of voltage and current harmonics to the 50th, unbalance, and mains signaling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust/water resistance</td>
<td>IP50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP65 water proof</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>LED + LCD</td>
<td>LED</td>
<td>LED</td>
</tr>
<tr>
<td>UPS ride-through</td>
<td>5 hour</td>
<td>3 s</td>
<td>3 s</td>
</tr>
<tr>
<td>Dimensions (HxWxD)</td>
<td>282 mm x 216 mm x 74 mm (11.5 in x 8.8 in x 3 in)</td>
<td>170 mm x 125 mm x 55 mm (6.9 in x 5 in x 2.2 in)</td>
<td></td>
</tr>
</tbody>
</table>

**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
- O385
  - Water-tight hard case with rolles

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.

**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.

**VR101I**: 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

**VR101I**
- 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

- MXB Clamp 1 A/10 A: 3 precision dual range current clamps (1 A/10 A)
- MXB Clamp 5 A/50 A +N: 4 precision dual range current clamps (5 A/50 A)
- C435: Water-tight hard case with rollers

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 provide 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.

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>NORMA 4000: 1 phase or 3 phase; NORMA 5000 and 2x3 phases</td>
</tr>
<tr>
<td>Basic accuracy</td>
<td>0.06 % to 0.3 % dependent on options</td>
</tr>
<tr>
<td>Sample rate</td>
<td>1 MHz, 2/3 MHz or 0.1 MHz dependent on options</td>
</tr>
<tr>
<td>Ranges</td>
<td>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.</td>
</tr>
<tr>
<td>Mechanical power</td>
<td>Optional process interface 4 x speed/torque/Pmech</td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS-232, optional IEEE 488.2/1, Ethernet, USB</td>
</tr>
<tr>
<td>RMS values</td>
<td>V/A/P/Q/S and derived values like Fundamental, THD ...</td>
</tr>
<tr>
<td>Oscilloscope</td>
<td>Simultaneous display of up to three values on sample level</td>
</tr>
<tr>
<td>FFT</td>
<td>Up to 1000 or half of sampling rate</td>
</tr>
<tr>
<td>Recorder</td>
<td>Display of three average values over time for trend determination</td>
</tr>
<tr>
<td>Vector</td>
<td>Display of Fundamental of all channels</td>
</tr>
</tbody>
</table>

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

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 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

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 (110/230 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 Logger
Norma 4000 BU43 High Precision Power Analyzer
Norma 5000 BU56 High Precision Power Analyzer

Power Quality Analyzers
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

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

**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

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

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.
Clamp Meters

**Fluke 360 AC Leakage Current Clamp Meter**

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**

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

**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.

**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.

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

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

Fluke 337 Premium Clamp Meter
- Rugged
- CAT III 600 V
- Inrush
- Compact

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

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

Temperature de-rating:
Add 0.1 x specified accuracy for each °C above 28 °C or below 18 °C

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 W
- Continuity for quick checking of shorts

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.

<table>
<thead>
<tr>
<th>Fluke 321</th>
<th>Fluke 322</th>
<th>Fluke 332</th>
<th>Fluke 334</th>
<th>Fluke 335</th>
<th>Fluke 336</th>
<th>Fluke 337</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC current</td>
<td>Range</td>
<td>to 400.0 A</td>
<td>40.00 A / 400.0 A</td>
<td>to 400.0 A</td>
<td>to 600.0 A</td>
<td>to 999.9 A</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1.8 % + 5 counts</td>
<td>2 % + 5 counts</td>
<td>2 % + 5 counts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC response</td>
<td>Averaging</td>
<td>True-rms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inrush integration time</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>100 ms</td>
</tr>
<tr>
<td>DC current</td>
<td>Range</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0 to 600.0 A</td>
<td>0 to 999.9 A</td>
</tr>
<tr>
<td>Accuracy</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2 % + 3 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC response</td>
<td>Averaging</td>
<td>True-rms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC volts</td>
<td>Range</td>
<td>400.0 V / 600.0 V</td>
<td>to 600.0 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>1.2 % + 5 counts</td>
<td>1 % + 5 counts</td>
<td>1 % + 5 counts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC response</td>
<td>Averaging</td>
<td>True-rms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC volts</td>
<td>Range</td>
<td>–</td>
<td>40.00 A / 400.0 A</td>
<td>to 600.0 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>–</td>
<td>–</td>
<td>1 % + 5 counts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohms</td>
<td>Range</td>
<td>to 400.0 Ω</td>
<td>600.0 Ω / 6000 Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>1 % + 5 counts</td>
<td>1.5 % + 5 counts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity</td>
<td>≤ 30 Ω</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hz</td>
<td>Range</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0 to 400 Hz</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.5 % + 5 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN/MAX</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Backlight</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Display hold</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>H x W x D</td>
<td>7.5 in x 2.6 in x 1.4 in</td>
<td>5.4 in x 3.1 in x 1.6 in</td>
<td>9.9 in x 3.1 in x 1.6 in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max wire dia.</td>
<td>1 in</td>
<td>1.2 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>8 oz</td>
<td>11 oz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Ordering information
- Fluke 321
- Fluke 335
- Fluke 322
- Fluke 336
- Fluke 333
- Fluke 337
- Fluke 334

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

Application note, literature code 2041786:
Making accurate inrush current measurements

Now 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. They 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

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

Ordering information
- Fluke 321
- Fluke 335
- Fluke 322
- Fluke 336
- Fluke 333
- Fluke 337
- Fluke 334
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

<table>
<thead>
<tr>
<th>Test Voltage (dc)</th>
<th>Range</th>
<th>Accuracy (± reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 V</td>
<td>200 kΩ to 5 GΩ</td>
<td>± (5% + 2 nA)</td>
</tr>
<tr>
<td>500 V</td>
<td>5 GΩ to 50 GΩ</td>
<td>± (5% + 2 nA)</td>
</tr>
<tr>
<td>1000 V</td>
<td>50 GΩ to 100 GΩ</td>
<td>± (5% + 2 nA)</td>
</tr>
<tr>
<td>2500 V</td>
<td>100 GΩ to 200 GΩ</td>
<td>± (5% + 2 nA)</td>
</tr>
<tr>
<td>5000 V</td>
<td>200 GΩ to 500 GΩ</td>
<td>± (5% + 2 nA)</td>
</tr>
</tbody>
</table>

- **Insulation resistance measurement**
- **Capacitance measurement**
- **Leakage current**
- **Ramp**
- **Timer**
- **AC/DC voltage measurement** up to 600 V
- **Live-circuit indicator**
- **Short circuit current**
- **Input overload protection**
- **Operating temperature**
- **Relative humidity**
- **Enclosure sealing**
- **Safety conformance**
- **Powerful troubleshooting and predictive maintenance tools**
- **Insulation resistance testing**
- **Autodischarge of capacitive voltage**
- **AC/DC voltage measurement up to 600 V**
- **Live-circuit indicator**
- **Leakage current**
- **Capacitance measurement**
- **Ramp**
- **Timer**
- **AC/DC voltage measurement** up to 600 V
- **Live-circuit indicator**
- **Short circuit current**: greater than 1 mA and less than 2 mA
- **Input overload protection**: 600 V ac continuous
- **Operating altitude**: 0 to 2000 meters
- **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

**Recommended accessories – 1550B MegOhmMeter**
- FlukeView Forms software, line cord, soft carrying case, and users manual.

**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**

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**

**Recommended accessories – 1520 MegOhmMeter**
- FlukeView Forms software, line cord, soft carrying case, and users manual.

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

Insulation Resistance Testing
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**
- **Remote probe, test leads, alligator clips, (K-type thermocouple, 1587 only)**
- **Rugged, utility hard case allows you to bring everything you need for the job**
- **Three-year warranty**

Specifications

<table>
<thead>
<tr>
<th></th>
<th>1587</th>
<th>1577</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation test voltages 50 V, 100 V, 250 V, 500 V, 1000 V</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Insulation test voltages 500 V, 1000 V</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Insulation test: 0.01 MΩ to 2 GΩ</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Insulation test: 0.1 MΩ to 600 MΩ</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Insulation test smoothing reading</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Frequency</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Capacitance</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Diode test</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Temperature</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Min/Max</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Low-pass filter (for work on VSDs)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>AC/DC Voltage</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>DC MilliVolts</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>AC/DC milliamps</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Resistance (0.1 Ω to 50 MΩ)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Continuity</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Three-year warranty</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Remote probe, test leads, alligator clips</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>K-type thermocouple</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Rugged, utility hard case</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Auto power off</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

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**

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 Thermometer

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

- Fluke 1587 Insulation Multimeter
- Fluke 1400 Current Clamp
- Fluke 9040 Phase Rotation Indicator

For more information and detailed specifications, go to www.fluke.com/1587
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
• Auto-discharge of capacitive voltage
• 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

Included accessories – 1507 and 1503 Testers

C101 Meter Hard Case
See page 70

ToolPak™ Meter Hanger
See page 71

C25 Meter Case
See page 70

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

Insulation Resistance Testing

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

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

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

Insulation Resistance Testing
# Process Tools Selection Guide

**Pick the right process tool for you**

## Process Calibration Tools

<table>
<thead>
<tr>
<th>Model</th>
<th>Loop Calibrator</th>
<th>Pressure Calibrator</th>
<th>Temperature Calibrator</th>
<th>Precision Multifunction Process Calibrator</th>
<th>Intrinsically Safe Calibrator</th>
<th>Documenting Process Calibrator</th>
<th>Process mA Clamp Meter</th>
<th>ProcessMeter® Test Tool</th>
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<td></td>
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</tr>
<tr>
<td>V dc</td>
<td>25 V</td>
<td>30 V</td>
<td>30 V</td>
<td>30 V</td>
<td>300 V</td>
<td>1000 V</td>
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<tr>
<td>V ac (true-rms)</td>
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<tr>
<td>Resistance</td>
<td>3200 Ω</td>
<td>4000 Ω</td>
<td>3200 Ω</td>
<td>11 kΩ</td>
<td></td>
<td>40 MΩ</td>
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<tr>
<td>A dc</td>
<td>24 mA</td>
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<td>24 mA</td>
<td>24 mA</td>
<td>110 mA</td>
<td>20.99, 99.9 mA</td>
<td>30 mA, 1 A</td>
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<tr>
<td>A ac</td>
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<tr>
<td>Frequency</td>
<td>15 kHz</td>
<td>10 kHz</td>
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<td>1 kHz</td>
<td>1 kHz</td>
<td>20 kHz</td>
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<tr>
<td>Pressure</td>
<td>1 psi, 30 psi, 100 psi, 300 psi</td>
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<tr>
<td>Temperature: RTDs</td>
<td>7 types</td>
<td>8 types</td>
<td>7 types</td>
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<tr>
<td>Temperature: TCs</td>
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<tr>
<td>Source/Simulate</td>
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<td>11 kΩ</td>
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<tr>
<td>mA do/Δ% scale</td>
<td>24 mA</td>
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<td>22 mA</td>
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<tr>
<td>mA source; auto step, auto ramp</td>
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<td>Min/Max</td>
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<td>Upload data to PC</td>
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<td>24 V loop supply</td>
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<td>12 V</td>
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<td>Non-contact measurement</td>
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<td>Integrated hand pressure pump</td>
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<td>Intrinsically safe (ATEX)</td>
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<td>Warranty</td>
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<td>3 years</td>
<td>3 years</td>
<td>1 year</td>
<td>3 years</td>
<td>1 year</td>
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<td>NIST traceable certification</td>
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<tr>
<td>Accessories</td>
<td>A/B</td>
<td>A/B</td>
<td>C</td>
<td></td>
<td>A/B</td>
<td>A/B</td>
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<tr>
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<td>39</td>
<td>45</td>
<td>38</td>
<td>44</td>
<td>43</td>
</tr>
</tbody>
</table>

1Fluke 700 Pressure Modules required.
2Either the internal sensor or a Fluke 700 Pressure Module may be used.
3Accessories: A. Compatible with LockPak B. Compatible with ToolPak C. Accepts hanging straps from ToolPak D. Optional accessories
4Fluke Process Calibrators in this guide displaying the Pressure Enabled symbol display readings from the 700 Series Pressure Modules.
5Fluke 700PEx Pressure Module required.
Fluke 741B, 743B and 744 Calibrators

For the calibration and troubleshooting of process control instrumentation

- 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.

For more information and detailed specifications, go to www.fluke.com/744upgrade

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.

Specifications – 741B, 743B and 744

<table>
<thead>
<tr>
<th>Function</th>
<th>Accuracy</th>
<th>Sensing</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>±0.005 % reading + 0.005 % full scale</td>
<td>±0.01 % output + 0.005 % full scale</td>
</tr>
<tr>
<td>DC current</td>
<td>±0.01 % reading + 0.015 % full scale</td>
<td>±0.01 % output + 0.015 % full scale</td>
</tr>
<tr>
<td>Resistance</td>
<td>±0.05 % reading + 50 mΩ</td>
<td>±0.1 % output + 40 mΩ</td>
</tr>
<tr>
<td>Frequency</td>
<td>0.05 %</td>
<td>0.1 %</td>
</tr>
<tr>
<td>RTDs</td>
<td>0.3 °C</td>
<td>0.2 °C</td>
</tr>
<tr>
<td>Pressure</td>
<td>±0.25 % of full scale, per pressure module specifications.</td>
<td></td>
</tr>
</tbody>
</table>

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
Fluke 726 and 725 Multifunction Process Calibrators

Step up to unmatched accuracy in process measurement and calibration.

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

Specifications – 726 and 725 Calibrators

<table>
<thead>
<tr>
<th>Function</th>
<th>Range or type</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>0 to 10 V</td>
<td>0.01 V</td>
<td>0.02 %</td>
<td>Max load, 1 mA</td>
</tr>
<tr>
<td></td>
<td>0 to 20 V</td>
<td>0.01 V</td>
<td>0.02 %</td>
<td>Max load, 1 mA</td>
</tr>
<tr>
<td></td>
<td>0 to 30 V</td>
<td>0.01 V</td>
<td>0.02 %</td>
<td>MAX load, 1.5 mA</td>
</tr>
<tr>
<td>mA</td>
<td>0 to 24</td>
<td>0.000 mA</td>
<td>0.1 %</td>
<td>Max load, 1000 Ω</td>
</tr>
<tr>
<td>mV (J/TC terminals)</td>
<td>-10.00 mV to +10.00 mV</td>
<td>0.01 mV</td>
<td>0.1 %</td>
<td>Max load, 1000 Ω</td>
</tr>
<tr>
<td>Ohms</td>
<td>15 Ω to 3,200 Ω</td>
<td>0.1 Ω</td>
<td>0.1 %</td>
<td>Source; Max load, 1000 Ω</td>
</tr>
<tr>
<td>Hz - CPM</td>
<td>2.0 to 1,000 CPM</td>
<td>1 Hz</td>
<td>0.05 %</td>
<td>Source; Max load, 1000 Ω</td>
</tr>
<tr>
<td>Loop supply</td>
<td>24 V dc</td>
<td>0 A</td>
<td>10 %</td>
<td>Source; Max load, 1000 Ω</td>
</tr>
<tr>
<td>T/C</td>
<td>1 °C, 1 °F</td>
<td>0.1 °C, 0.1 °F</td>
<td>± 0.1 °C</td>
<td>Source; Max load, 1000 Ω</td>
</tr>
<tr>
<td>RTDs</td>
<td>Cu (10), Ni200 (672), Pt 100, 200, 500, 1000 (385), Pt 100 (358), Pt 100 (382)</td>
<td>0.01 %, 0.01 °F</td>
<td>± 0.05 %</td>
<td>Source; Max load, 1000 Ω</td>
</tr>
</tbody>
</table>

Unique 726 specifications are bolded

Recommended accessories – 726 and 725 Calibrators

Fluke-725 Multifunction Process Calibrator

- 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
- 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)

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

### Specifications – 712 and 714 Calibrators

<table>
<thead>
<tr>
<th>Model</th>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluke-712</td>
<td>Measure/simulate RTD</td>
<td>-200 °C to 800 °C (Pt 100-385)</td>
<td>0.1 °C, 0.1 °F</td>
<td>0.2 °C, 0.4 °F (Pt 100-385)</td>
<td>Pt: 100 200 500 1000 (385); Pt: 100 (392); Pt: 100 500 385 1000 (392); Ni: 120 (372)</td>
</tr>
<tr>
<td></td>
<td>Measure/simulate resistance</td>
<td>± 2 Ω to 4000 Ω</td>
<td>0.1 Ω</td>
<td>0.025 %</td>
<td></td>
</tr>
<tr>
<td>Fluke-714</td>
<td>Measure/simulate thermocouple</td>
<td>-300 °C to 1800 °C (Pt 385)</td>
<td>0.1 °C or °F</td>
<td>0.5 °C, 0.8 °F (Type B)</td>
<td>9 TC types: J K T E R S B (per NIST 175 and ITS-90) per DIN 43710 and PTB-68</td>
</tr>
<tr>
<td></td>
<td>Measure/simulate mV</td>
<td>-10 mV to 75 mV</td>
<td>0.01 mV</td>
<td>0.015 % ± 10 pp</td>
<td></td>
</tr>
</tbody>
</table>

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: 65 % (0 °C to 35 °C); 75 % (35 °C to 40 °C); 45 % (40 °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: EN61326:1999 and EN60022:1994 Class B

Included accessories:
- 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.

**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

Data Sheet, literature code 1560369:
- Temperature calibration

**Ordering information**
- Fluke-712 RTD Calibrator
- Fluke-714 Thermocouple 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 V 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 psi 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 700Pxx 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

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>717-1</td>
<td>±0.0001 psi, 0.0001 kPa,</td>
<td>Fluke-718 dry air only and includes on</td>
</tr>
<tr>
<td>717-1G</td>
<td>0.0001 in H2O</td>
<td>board pump</td>
</tr>
<tr>
<td>717-30G</td>
<td>±0.001 psi, 0.001 kPa,</td>
<td>Fluke-718 dry air only and includes on</td>
</tr>
<tr>
<td>717-300G</td>
<td>0.001 in H2O</td>
<td>board pump</td>
</tr>
<tr>
<td>717-100G</td>
<td>±0.01 psi, 0.01 kPa,</td>
<td>Fluke-718 dry air only and includes on</td>
</tr>
<tr>
<td>717-1000G</td>
<td>0.01 in H2O</td>
<td>board pump</td>
</tr>
<tr>
<td>717-5000G</td>
<td>±0.05 psi, 0.05 kPa,</td>
<td>Fluke-718 dry air only and includes on</td>
</tr>
<tr>
<td>717-5000G</td>
<td>0.05 in H2O</td>
<td>board pump</td>
</tr>
</tbody>
</table>

Fluke 700 Series Pressure Modules

- 29 pressure modules
- 8 intrinsically safe pressure modules
- Ranges from 1.000 in H0 (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

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

- For more information and detailed specifications, go to www.fluke.com/pressure
**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 **on-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)

---

**Specifications – 715, 707 and 705**

<table>
<thead>
<tr>
<th>Functions</th>
<th>Fluke 705 and 707</th>
<th>Fluke 715</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage measurement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>0 to 28 V</td>
<td>0 to 200 mV</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 mV</td>
<td>10 µV</td>
</tr>
<tr>
<td>Accuracy</td>
<td>705: 0.025 % Rdg + 1 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD</td>
<td>0.01 % Rdg + 2 LSD</td>
</tr>
<tr>
<td><strong>Current measurement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>0 to 24 mA</td>
<td>0 to 24 mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.001 mA</td>
<td>0.001 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>705: 0.02 % Rdg + 1 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD</td>
<td>0.01 % Rdg + 2 LSD</td>
</tr>
<tr>
<td><strong>Current sourcing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>0 to 20 mA or 4 to 20 mA</td>
<td>0 to 20 mA or 4 to 20 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>705: 0.035 % Rdg + 2 LSD 707, 707Ex: 0.015 % Rdg + 2 LSD</td>
<td>0.01 % Rdg + 2 LSD</td>
</tr>
<tr>
<td>Drive capability</td>
<td>1000 Ω @ 24 mA</td>
<td>1000 Ω @ 24 mA</td>
</tr>
<tr>
<td>Loop power while measuring mA</td>
<td>24 V</td>
<td>24 V</td>
</tr>
<tr>
<td><strong>Voltage sourcing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display current and % of span</td>
<td>Yes</td>
<td>mA or %</td>
</tr>
<tr>
<td>Auto step, auto ramp</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Span Check</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Battery life</td>
<td>18 hours typical, at 12 mA</td>
<td>18 hours typical, at 12 mA</td>
</tr>
</tbody>
</table>

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 Modular Pressure/Vacuum Module (See page 65)

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

**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
Fluke 789 and 787 ProcessMeter™ Test Tools

Safety rated multimeters with mA source

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

Specifications – 789 and 787 ProcessMeter

<table>
<thead>
<tr>
<th>Measurement function</th>
<th>Best accuracy range and resolution</th>
<th>(% of reading + 1 LSD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V dc</td>
<td>400.0 mV, 4.000 V, 40.0 V, 400.0 V, 1000 V</td>
<td>0.1 % + 1</td>
</tr>
<tr>
<td>V dc (true-rms)</td>
<td>400.0 mV, 4.000 V, 40.0 V, 400.0 V, 1000 V</td>
<td>0.7 % + 2</td>
</tr>
<tr>
<td>mA dc</td>
<td>1000 A, 0.440 A continuous</td>
<td>0.2 % + 1</td>
</tr>
<tr>
<td>A ac</td>
<td>1000 A, 0.440 A continuous</td>
<td>0.2 % + 1</td>
</tr>
<tr>
<td>Resistance</td>
<td>400.0 W, 4.000 k, 40.0 k, 400.0 k, 4.0 M, 40 M</td>
<td>0.2 % + 1</td>
</tr>
<tr>
<td>Frequency (0.5 Hz to 20 kHz)</td>
<td>199.99 Hz, 1999.9 Hz, 19.999 kHz</td>
<td>0.005 % + 1</td>
</tr>
<tr>
<td>Diode Test</td>
<td>789: 2.000 V (shows diode voltage drop) 787: 2.400 V (shows diode voltage drop)</td>
<td>2 % + 1 2 % + 1</td>
</tr>
</tbody>
</table>

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 | 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 | 0.5 % |
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 | Over-range to 24.000 mA | 1000 Ohms, @ 20 mA | 0.5 % |
24 V loop supply | 789: Minimum 24 V 787: not available | 250 Ohms @ 20 mA | > 24 V |
Current adjustment modes | Manual, Coarse, Fine, and 25 % and 100 % step (100 % step 789 only) Automatic: slow ramp, fast ramp, 25 % step |

Recommended accessories – 787 and 789 ProcessMeter

Applicaton 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

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

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

### 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

**9102S and 9100S**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Features</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-21.0 mA to +20.99 mA</td>
<td>0.01 mA</td>
<td>±0.2 °C or reading ±5 counts</td>
<td>Zero, Hold, backlight, measurement spotlight</td>
<td>Use for measuring and troubleshooting 4 mA to 20 mA signals</td>
</tr>
<tr>
<td>-21.0 mA to -99.9 mA</td>
<td>0.1 mA</td>
<td>±0.5 °C or reading ±5 counts</td>
<td>Zero, Hold, backlight, measurement spotlight</td>
<td>Use for measuring and troubleshooting 10 mA to 50 mA signals</td>
</tr>
</tbody>
</table>

**9100S**

- Range: 35 °C to 375 °C (95 °F to 707 °F)
- Accuracy: ±0.5 °C
- Stability: ±0.1 °C at 100 °C, ±0.3 °C at 375 °C
- Well-to-well uniformity: ±0.2 °C with sensors of similar size at equal depths within wells
- Stabilization: 5 minutes
- Well depth: 102 mm (4 in); 1.6 mm (1/16 in) hole is 89 mm (3.5 in) deep
- Removal inserts: N/A
- Power: 115 V ac (±10 %), 1.5 A or 230 V ac (±10 %), 0.8 A
- Size (W x D x H): 102 mm x 122 mm x 150 mm (4 in x 12 in x 6 in)
- Weight: 1 kg (2 lb, 3 oz)
- NIST-traceable calibration: Data at 50 °C, 150 °C, 200 °C, 250 °C, 300 °C and 350 °C

**9102S**

- Range: -10 °C to 122 °C (14 °F to 252 °F) at 23 °C ambient
- Accuracy: ±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: 7 minutes
- Well depth: 102 mm (4 in); 1.6 mm (1/16 in) hole is 89 mm (3.5 in) deep
- Removal inserts: 1/4 in, 3/16 in (1/16 in in optional)
- Power: 115 V ac (±10 %), 1.5 A or 230 V ac (±10 %), 0.8 A
- Size (W x D x H): 102 mm x 122 mm x 150 mm (4 in x 12 in x 6 in)
- Weight: 1.8 kg (4 lb)
- NIST-traceable calibration: Data at -10 °C, 24 °C, 50 °C, 55 °C, 100 °C and 122 °C

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

### Fluke 771 included accessories

- Carrying case, and instruction manual

### Ordering information

**Fluke-771 Milliamp Process Clamp Meter**

<table>
<thead>
<tr>
<th>9102S and 9100S ordering information</th>
</tr>
</thead>
<tbody>
<tr>
<td>9102S-A-156 Dry-Well, Block A (1)</td>
</tr>
<tr>
<td>9102S-A-256 Dry-Well, Block A (2)</td>
</tr>
<tr>
<td>9102S-B-156 Dry-Well, Block B (1)</td>
</tr>
<tr>
<td>9102S-B-256 Dry-Well, Block B (2)</td>
</tr>
<tr>
<td>9100S-D-156 Dry-Well, Block D (1)</td>
</tr>
<tr>
<td>9100S-D-256 Dry-Well, Block D (2)</td>
</tr>
<tr>
<td>9300 Rugged Carrying Case, 9100</td>
</tr>
<tr>
<td>9102S-256 Dry-Well, -10 to 122 (2 Wells) (2)</td>
</tr>
<tr>
<td>9320-156 Battery Pack, 9102 (1)</td>
</tr>
<tr>
<td>9320-256 Battery Pack, 9102 (2)</td>
</tr>
</tbody>
</table>

**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]
- 3102-5 Insert, AL 3/8 in (9.5 mm) [Standard]
- 3102-6 Insert, AL 7/16 in (11.1 mm) [Standard]
- 3102-7 Insert, AL 5/32 in (4 mm) [Standard]
- 9308 Hard Carrying Case, 9102/9132

---

**New Process Calibration Tools**

For more information and detailed specifications, go to www.fluke.com/processmeters
**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 87V, 707, 718, 725, 574, 68) or go to www.fluke.com/ex

---

<table>
<thead>
<tr>
<th>Fluke products</th>
<th>ATEX certified</th>
<th>North American Certification</th>
<th>For additional product detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>87V Ex: Intrinsically Safe True-rms Multimeter</td>
<td>II 2 G Ex ia IIC T4</td>
<td>See page 14</td>
<td></td>
</tr>
<tr>
<td>707Ex: Intrinsically Safe mA Calibrator</td>
<td>II 2 G Ex ia IIC T4</td>
<td>See page 42</td>
<td></td>
</tr>
<tr>
<td>718Ex: Intrinsically Safe Pressure Calibrator</td>
<td>II 1 G Ex ia IIC T4</td>
<td>See page 41</td>
<td></td>
</tr>
<tr>
<td>725Ex: Intrinsically Safe Multifunction Calibrator</td>
<td>II 1 G Ex ia IIB 171 °C</td>
<td>See page 39</td>
<td></td>
</tr>
<tr>
<td>700PEx: Intrinsically Safe Pressure Modules</td>
<td>II 1 G Ex ia IIC T4</td>
<td>See page 41</td>
<td></td>
</tr>
<tr>
<td>Fluke 574-NI Nonincendive Infrared Thermometer</td>
<td>APPROVED Class 1, Division 1, Groups A, B, C, D; Class 1 Zone 0 AEx ia IIC</td>
<td>See page 51</td>
<td></td>
</tr>
<tr>
<td>Fluke 68IS Intrinsically Safe Infrared Thermometer</td>
<td>APPROVED Class 1, Division 1, Groups A, B, C, D Class 1 Zone 0 AEx ia IIC</td>
<td>See page 53</td>
<td></td>
</tr>
</tbody>
</table>

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.
Ti40 and Ti50 Series IR FlexCam® Thermal Imagers

The thermal imagers for professionals demanding the best

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.

Features - Ti40 and Ti50 Series Imagers

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

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

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

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.

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

Thermal Imaging
### Specifications - Ti40 and Ti50 Series

<table>
<thead>
<tr>
<th>Feature</th>
<th>Ti40</th>
<th>Ti45</th>
<th>Ti50</th>
<th>Ti55</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal imaging performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of view (FOV)*</td>
<td>23° horizontal x 17° vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spatial resolution (IFOV)*</td>
<td>0.15 m</td>
<td>0.15 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min focus distance*</td>
<td>0.15 m</td>
<td>0.15 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal sensitivity (NETD) at 30 °C</td>
<td>-0.09 °C</td>
<td>-0.09 °C</td>
<td>-0.07 °C</td>
<td>-0.05 °C</td>
</tr>
<tr>
<td>Detector data acquisition/image frequency</td>
<td>30 Hz/30 Hz</td>
<td>60 Hz/60 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus</td>
<td>SmartFocus; single finger continuous focus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR digital zoom</td>
<td>2x</td>
<td>2x</td>
<td>2x</td>
<td>2x, 4x, 8x</td>
</tr>
<tr>
<td>Detector type</td>
<td>Focal Plane Array, Vanadium Oxide (VOx) Uncooled Microbolometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spectral band</td>
<td>8 µm to 14 µm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visual imaging performance (Fusion models only)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-camera operating modes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picture-in-Picture</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Full thermal, full visual light or merged thermal-visual images</td>
<td>SmartView only</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Visible light camera</td>
<td>1280 x 1024 pixels, full color (1.3 megapixels)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visible light digital zoom</td>
<td>2x</td>
<td>2x</td>
<td>2x</td>
<td>2x, 4x</td>
</tr>
<tr>
<td>Visible color alarm above and below</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Temperature measurement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibrated temperature range</td>
<td>-20 °C to 350 °C</td>
<td>-20 °C to 600 °C</td>
<td>-20 °C to 350 °C</td>
<td>-20 °C to 600 °C</td>
</tr>
<tr>
<td>1200 °C High temperature option</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.2 °C or 0.1% (whichever is greater)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement modes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centerpoint, center box (area min/max, average)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moveable spots/boxes</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Isotherm, automatic hot and cold point detection</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emissivity correction</td>
<td>0.1 to 1.0 (0.01 increments)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Image presentation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital display</td>
<td>9” large high-resolution backlit LCD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video output</td>
<td>RS170 EIA/NTSC or CCIR/PAL composite video</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palettes</td>
<td>Grayscale, grayscale inverted, blue red, high contrast, hot metal, isotherm, amber, amber inverted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional lenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54 mm Telephoto lens</td>
<td>High precision Germanium lens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of view (FOV)</td>
<td>9° horizontal x 6° vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spatial resolution (IFOV)</td>
<td>0.94 mrad</td>
<td>0.47 mrad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min focus distance</td>
<td>0.6 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.5 mm wide angle lens</td>
<td>High precision Germanium lens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of view (FOV)</td>
<td>42° horizontal x 32° vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spatial resolution (IFOV)</td>
<td>4.9 mrad</td>
<td>2.45 mrad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min focus distance</td>
<td>0.3 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Image and data storage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage medium</td>
<td>Compact flash card (512MB) stores over 1000 IR images</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File formats supported</td>
<td>14 bit measurement data included.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image and data storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data formats: comma separated (csv), tab separated (txt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interfaces and software</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Compact flash card reader included</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included software</td>
<td>SmartView; Full analysis and reporting software</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser (IR-Fusion models only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Class II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser targeting</td>
<td>Laser dot visible on blended and visual image</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls and adjustments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set-up controls</td>
<td>Date/time, “C”/“F”, language, scale, LCD intensity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image controls</td>
<td>Level, spin, auto adjust (continuous/manual)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-screen indicators</td>
<td>Battery status, emissivity, background temperature and real time clock</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recommended accessories – Ti40 and Ti50 Series Imagers**

- 103232 Anti-glare Hood
- 104543 Car Charger
- Ti-SBC Battery Charger
- Ti-SBP Rechargeable Battery Pack

**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
- Fluke-TiSSP-20 IR FlexCam Thermal Imager with IR-Fusion

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

## 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.

## Specifications - Ti20 Thermal Imager

<table>
<thead>
<tr>
<th>Detector</th>
<th>128 x 96 thermal element focal plane array (FPA) uncooled microbolometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETD (thermal sensitivity)</td>
<td>≤ 0.2 °C at 30 °C</td>
</tr>
</tbody>
</table>

### 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
- **Foxtail**: 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.

## 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

For more information and detailed specifications, go to [www.fluke.com/thermal_imaging](http://www.fluke.com/thermal_imaging)
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.

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**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](http://www.fluke.com/thermal_imaging)

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**Specifications – Ti30™ Thermal Imager**

<table>
<thead>
<tr>
<th>Detector</th>
<th>120 x 160 thermal element uncooled focal plane array microbolometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETD (Noise equivalent temp. difference)</td>
<td>200 mK</td>
</tr>
<tr>
<td><strong>Thermal</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>-10 °C to 250 °C (14 °F to 482 °F)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±2 % or ±2 ºC (± 3 % or 3 °C from -10 to 0 °C)</td>
</tr>
<tr>
<td><strong>Optical</strong></td>
<td></td>
</tr>
<tr>
<td>Optical resolution</td>
<td>90:1</td>
</tr>
<tr>
<td>Silt response optical resolution</td>
<td>225:1</td>
</tr>
<tr>
<td>Minimum diameter measurement spot</td>
<td>7 mm (0.27 in) at 61 cm (24 in)</td>
</tr>
<tr>
<td>Field of view (FOV)</td>
<td>17 º horizontal x 12.8 º vertical</td>
</tr>
<tr>
<td>Target outline</td>
<td>Single laser dot (Meets IEC Class 2 &amp; FDA Class II requirements)</td>
</tr>
<tr>
<td>Controls and adjustments</td>
<td></td>
</tr>
<tr>
<td>Focus</td>
<td>Focusable, 51 cm (24 in) to infinity</td>
</tr>
<tr>
<td>Temperature scale</td>
<td>°C or °F selectable</td>
</tr>
<tr>
<td>Palettes</td>
<td>Gray, rainbow or rainbow</td>
</tr>
<tr>
<td>Measurement modes</td>
<td>Automatic, semi-automatic or manual</td>
</tr>
<tr>
<td>LCD backlight</td>
<td>Bright, dim, off-selectable</td>
</tr>
<tr>
<td>Adjustable emissivity</td>
<td>0.10 to 1.00 by 0.01</td>
</tr>
<tr>
<td>Reflected background temperature</td>
<td>-50 °C to 460 °C [-58 °F to 860 °F]</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td>-10 °C to 50 °C (14 °F to 122 °F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 to 90 % non-condensing</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 °C to 70 °C (-13 °F to 158 °F) [without batteries]</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>Image storage capacity</td>
<td>100 images</td>
</tr>
<tr>
<td>Power</td>
<td>Rechargeable battery pack or 6AA batteries (not included)</td>
</tr>
<tr>
<td>Battery life</td>
<td>Minimum 5 hours continuous use</td>
</tr>
<tr>
<td>Image frame rate</td>
<td>20 Hz, 9 Hz</td>
</tr>
<tr>
<td>Thermal analysis software</td>
<td>InsideIR (included)</td>
</tr>
<tr>
<td>PC software operating systems</td>
<td>Microsoft® Windows® 2000® or XP®</td>
</tr>
<tr>
<td>Weight (includes batteries)</td>
<td>1 kg (2.2 lb)</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year (U.S. only)</td>
</tr>
</tbody>
</table>

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

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For more information and detailed specifications, go to [www.fluke.com/thermal_imaging](http://www.fluke.com/thermal_imaging)

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**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](http://www.fluke.com/demo)
Thermal Imaging

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 |
| Flk-TIR2/FT-20 | IR Flexcam BD |
| Flk-TIR3-20 | IR Flexcam BD |
| Flk-TIR3/FT-20 | IR Flexcam BD |
| Flk-TIR4-20 | IR Flexcam BD |
| Flk-TIR4/FT-20 | IR Flexcam BD |
| 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.

- 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

Specifications - 572, 574 and 576 IRTs

<table>
<thead>
<tr>
<th>Models</th>
<th>Fluke-572</th>
<th>Fluke-574</th>
<th>Fluke-574-NI</th>
<th>Fluke-576</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>-30 °C to 900 °C (-25 °F to 1600 °F)</td>
<td>-30 °C to 900 °C (-25 °F to 1600 °F)</td>
<td>-30 °C to 900 °C (-25 °F to 1600 °F)</td>
<td>-30 °C to 900 °C (-25 °F to 1600 °F)</td>
</tr>
<tr>
<td>D:S (Distance to Spot size)</td>
<td>60:1 [50:1 with close focus option (close focus not available with NI model)]</td>
<td>60:1 [50:1 with close focus option (close focus not available with NI model)]</td>
<td>60:1 [50:1 with close focus option (close focus not available with NI model)]</td>
<td>60:1 [50:1 with close focus option (close focus not available with NI model)]</td>
</tr>
<tr>
<td>Laser sighting</td>
<td>3-dot, coaxial, extra-bright</td>
<td>3-dot, coaxial, extra-bright</td>
<td>3-dot, coaxial, extra-bright</td>
<td>3-dot, coaxial, extra-bright</td>
</tr>
<tr>
<td>Emissivity</td>
<td>Adjustable</td>
<td>Adjustable, plus table of 30 preset values</td>
<td>Adjustable, plus table of 30 preset values</td>
<td>Adjustable, plus table of 30 preset values</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.75 % of reading or ± 0.75 °C (± 1.5 °F) whichever is greater</td>
<td>± 0.75 % of reading or ± 0.75 °C (± 1.5 °F) whichever is greater</td>
<td>± 0.75 % of reading or ± 0.75 °C (± 1.5 °F) whichever is greater</td>
<td>± 0.75 % of reading or ± 0.75 °C (± 1.5 °F) whichever is greater</td>
</tr>
<tr>
<td>Response time</td>
<td>250 msec</td>
<td>250 msec</td>
<td>250 msec</td>
<td>250 msec</td>
</tr>
<tr>
<td>Display hold (7 seconds)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LCD backlight</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>MAX, MIN temperatures</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DIF, AVG temperatures</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Recall last reading</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Audible/visible HI alarm</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Audible/visible LO alarm</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bar graph display</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100-point data logging</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Data graphing software (Windows 2000, XP compatible)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Photo viewing software (Windows 2000, XP, NT compatible)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>26 images (640 x 480 pixels)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>100 images (320 x 240 pixels)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Image file format [jpg]</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Protective hard case</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Weight</td>
<td>472 g (1 lb, 1 oz)</td>
<td>480 g (1 lb, 1 oz)</td>
<td>480 g (1 lb, 1 oz)</td>
<td>580 g (1 lb, 1 oz)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>16.7 cm x 5 cm x 19.6 cm (6.58 in x 1.97 in x 7.76 in)</td>
<td>16.7 cm x 5 cm x 19.6 cm (6.58 in x 1.97 in x 7.76 in)</td>
<td>16.7 cm x 5 cm x 19.6 cm (6.58 in x 1.97 in x 7.76 in)</td>
<td>16.7 cm x 5 cm x 19.6 cm (6.58 in x 1.97 in x 7.76 in)</td>
</tr>
<tr>
<td>Power</td>
<td>2 AA batteries</td>
<td>2 AA batteries/AC adapter</td>
<td>2 AA batteries/AC adapter</td>
<td>2 AA batteries/USB</td>
</tr>
<tr>
<td>Warranty</td>
<td>Two-years, conditional</td>
<td>Two-years, conditional</td>
<td>Two-years, conditional</td>
<td>Two-years, conditional</td>
</tr>
</tbody>
</table>

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

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 (IC); T4Ta=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.

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 with/Log SW
Fluke-574-NI Precision Infrared Thermometer with/Log SW Nonincendive
Fluke-574-CF Precision Infrared Thermometer with/Log SW Close Focus
Fluke-576 Precision, Photographic Infrared Thermometer with/Log SW Close Focus
Fluke-576-CF Precision, Photographic Infrared Thermometer with/Log SW Close Focus

Thermometers
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 backlight 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

Specifications - 51, 52, 53 and 54 Series II

<table>
<thead>
<tr>
<th>Feature</th>
<th>51</th>
<th>52</th>
<th>53</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>Single</td>
<td>Single</td>
<td>Single</td>
<td>Single</td>
</tr>
<tr>
<td>Time stamp</td>
<td>Relative time</td>
<td>Relative time</td>
<td>Time of day</td>
<td>Dual</td>
</tr>
<tr>
<td>Temperature measurement accuracy (for temperatures above -100 °C)</td>
<td>±(0.05% + 0.3 °C (0.5 °F))</td>
<td>±(0.05% + 0.3 °C (0.5 °F))</td>
<td>±(0.05% + 0.4 °C (0.7 °F))</td>
<td>±(0.05% + 0.4 °C (0.7 °F))</td>
</tr>
<tr>
<td>Measurement range (depending on thermocouple type)</td>
<td>-250 °C to 1767 °C ([-428 °F to 3212 °F])</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display resolution</td>
<td>0.1 °C/°F/K &lt; 100°</td>
<td>1 °C/°F/K &gt; 100°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>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)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>400 g (14 oz)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (HxWxD)</td>
<td>17.3 cm x 8.6 cm x 3.8 cm (6.8 in x 3.4 in x 1.5 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>3 AA batteries; typical 1000-hour life</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Included accessories

- Fluke 51: K-bead Thermocouple(s), batteries, overview manual and instructional guide on CD-ROM.
- Fluke 561HVACPro includes:
  - Infrared thermometer with contact thermometer capabilities, 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

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

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
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)

### Specifications - 561, 61, 62, 63, 66, 68

<table>
<thead>
<tr>
<th></th>
<th>561</th>
<th>61</th>
<th>62</th>
<th>63</th>
<th>66</th>
<th>68</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature range</strong></td>
<td>-40 °C to 500 °C (-40 °F to 932 °F)</td>
<td>-30 °C to 925 °C (-20 °F to 1,500 °F)</td>
<td>-30 °C to 1207 °C (-20 °F to 2,200 °F)</td>
<td>-32 °C to 925 °C (-25 °F to 1,500 °F)</td>
<td>-32 °C to 660 °C (-25 °F to 1,100 °F)</td>
<td>-32 °C to 760 °C (-25 °F to 1,400 °F)</td>
</tr>
<tr>
<td><strong>Emissivity</strong></td>
<td>Adjustable with three settings: Low (0.3), Medium (0.7), High (0.95)</td>
<td>Fixed at 0.95</td>
<td></td>
<td></td>
<td></td>
<td>Digitally adjustable (from 0.1 to 1.0)</td>
</tr>
<tr>
<td><strong>Optical resolution</strong></td>
<td>12:1</td>
<td>8:1</td>
<td>10:1 at 80 % energy</td>
<td>12:1</td>
<td>30:1</td>
<td>50:1</td>
</tr>
<tr>
<td><strong>Laser sighting (class II)</strong></td>
<td>Single point laser</td>
<td>Offset single point laser</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>&lt; 500 msec</td>
<td>&lt; 500 msec</td>
<td>&lt; 0.5 second</td>
<td>(95 % of reading)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum usable spot size</strong></td>
<td>25 mm (1 in)</td>
<td>24 mm (0.9 in)</td>
<td>18 mm (0.7 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>± 0.5 % of reading</td>
<td>± 1 °C or ± 2 °C, whichever is greater</td>
<td>± 0.5 % of reading</td>
<td>± 1 °C or ± 2 °C, whichever is greater</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>-2 °C or 2 °C, whichever is greater</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient operating temperature</strong></td>
<td>0 °C to 50 °C (32 °F to 120 °F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>10 to 90 % RH non-condensing, at &lt; 30 °C (86 °F)</td>
<td>10 to 90 % RH non-condensing, at &lt; 10 °C (50 °F)</td>
<td>10 to 90 % RH non-condensing, at &lt; 30 °C (86 °F)</td>
<td>ambient</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-20 °C to 65 °C (-25 °F to 180 °F)</td>
<td>-20 °C to 65 °C (-4 °F to 140 °F)</td>
<td>-20 °C to 65 °C (-4 °F to 140 °F)</td>
<td>without battery</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>173.8 mm x 51 mm x 38 mm (6 in x 2 in x 1.5 in)</td>
<td>190 mm x 51 mm x 38 mm (7 in x 2 in x 1.5 in)</td>
<td>220 mm x 30 mm x 35 mm (8 in x 1 in x 1.5 in)</td>
<td>200 mm x 160 mm x 55 mm (8 in x 6 in x 2 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>330 g (11 oz)</td>
<td>341 g (0.75 lb)</td>
<td>320 g (11 oz)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>1.5 V battery (alkaline or NiCd)</td>
<td>9 V alkaline or customer supplied NiCd battery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Battery life (alkaline)</strong></td>
<td>12 hours</td>
<td>10 hours with laser and backlight on, 40 hours with laser and backlight off</td>
<td>20 hours with laser and backlight on 50 % 40 hours with laser and backlight off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Typical distance to target</strong></td>
<td>Up to 2 m (6 ft)</td>
<td>Up to 2 m (6 ft)</td>
<td>Up to 2 m (6 ft)</td>
<td>Up to 5 m (16 ft)</td>
<td>Up to 8 m (25 ft)</td>
<td></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>Two-year limited</td>
<td>Two-year limited</td>
<td>Two-year limited</td>
<td>Two-year limited</td>
<td>Two-year limited</td>
<td>Two-year limited</td>
</tr>
</tbody>
</table>

### 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

### 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, hard 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**

### Recommended accessories – 60 Series Thermometers

- **80PR-60** Temperature Probe (61/66/68 only) See page 69
- **H6** Meter Case (63/66/68/64 only) See page 70
- **LVD1** Volt Light (all models) See page 64
- **CS10** 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
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, CO₂, 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, CO₂, 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
- CO₂ 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

### Included accessories
- **Fluke-975CK AirMeter Calibration Kit** includes the gases and tools necessary to keep your Fluke 975 AirMeter calibrated.

### Ordering information
- **Fluke-975** AirMeter
- **Fluke-975V** AirMeter with Velocity
- **Fluke-902** HVAC Clamp Meter

### Specifications

#### Fluke 975 AirMeter™

- Range: -20 °C to 50 °C (-5 °F to 122 °F)
- Display Resolution: 0.1 °C (0.1 °F)
- Accuracy: ± 0.9 °C/± 1.62°F from 40 °C to 60 °C ± 0.5 °C/± 0.9°F from 20 °C to 25 °C
- Relative humidity: 10 % to 90 % RH (non-condensing) ± 2 % RH (90 % RH to 90 % RH)
- Air velocity: 50.0 fpm to 3000 fpm (0.25 m/sec to 15 m/sec) ± 4 % or 4 fpm, whichever is greater
- CO₂: 0 to 5000 ppm ± 2.75 % + 75 ppm
- CO: 0 to 500 ppm ± 5 % or ± 3 ppm, whichever is greater, @ 20 °C and 50 % RH

#### Fluke 902 True-rms HVAC Clamp Meter

- 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) ± 1 % of reading ± 0.8 °C (+/-0.8°C) typical
- Capacitance: 1-1000 µF 1.8 % ± 2 counts

### Fluke-975AP AirMeter

Velocity Probe for use with Fluke 975 AirMeter.
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
- Graphical 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

Fluke 983TPK Thermal Printer Kit
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
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>192, 196, 199</th>
<th>123, 124</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCC 120</td>
<td>Software, cable and carrying case package</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>SCC 190</td>
<td>Software, cable and carrying case package</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>C125</td>
<td>Compact soft case</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>C195</td>
<td>Universal soft carrying case</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>PAC91</td>
<td>Optical to parallel printer adapter cable</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

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

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, 27,500 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 GSa/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

See what’s really happening
With a maximum real-time sampling rate of 2.5 GSa/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!

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

Cable and adapters

PA91
- 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

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

PM9083
- Male BNC to dual female BNC T-piece
- Set consists of two adapters

BB10
- 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

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.
## Fluke accessory selection guide

Find the right accessories to make your meter work for you

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<th>Current</th>
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<th>Insulation</th>
<th>Test Leads</th>
<th>Safety Symbols</th>
<th>FlukeView® Form Software</th>
<th>Professional Use</th>
<th>Test Leads</th>
<th>Standard Test Lead Input</th>
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- **Accessories**
- **Professional Use**
- **Test Leads**
- **Standard Test Lead Input**

### Notes

- **11** Requires BOTK (2) Requires BOAX (3) Limited low level ac capability – see page 40 (4) Requires PM6081/001 Adapter (5) Requires PM6082/001 adapter
- **A universal accessory. Works with most brands of meters. For detailed Current Clamp specifications see pages 58 and 59. *Included with the 128 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

**TLK-220 SureGrip™ Accessory Kit with Meter Carry Case**
- 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
- Zippered vinyl carry case with moveable divider
- Holds large DMMs

**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

**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

**TLK225 SureGrip™ MasterAccessory 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

**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

**T5 Tester Starter Kit**
Getting started kit for electricians who already own a Fluke T5 Tester.
- TP220 Test Probes
- AC285 Large Jaw Alligator Clips
- C333 Zippered Soft Case

**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

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

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| 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

**Modular clips (for use with test leads)**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| 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

| 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

| 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, 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
For electronic applications

Fluke test leads, probes and clips

Test leads for all your measurement needs

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

TL81A Deluxe Electronic Test Lead Set
• 22 piece set with quadfold pouch
• Includes mini alligator clips, hooks and pinces 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

New! TP80 Electronic Test Probes
• Tapered tip ideal for probing electronic components or boards
• Removable guard for IC probing
• CAT II 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

TL60A 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 more information and detailed specifications, go to www.fluke.com/accessories

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! 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! 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! 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

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

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)
Fluke illuminates the task at hand

Get all the light you need and keep your hands free

**L00 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

**L05 Mini Hat Light**
- Rugged, high-intensity Xenon worklight
- Attaches to a baseball cap
- Includes a hat clip
- Includes two AAA batteries
- Waterproof

**L06 Deluxe LED Hat Light** (hard hat not included)
- Three super bright white LEDs—never burn out
- Special hard-hat attachment included
- 40-hour battery life
- Includes three AAA batteries

**L07 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

**L201 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
- Waterproof

**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

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

**L11 Probe Light Kit**
- L00 probe light
- TL71 premium DMM test lead set
- C75 zippered case

**L15 SureGrip™ Kit with Probe Light and Probe Extenders**
- L200 probe light
- TP220 SureGrip test probes
- TL24 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
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.

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

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 function and a 10 MΩ input impedance, and quickly and accurately verify fiber optic cable system loss. Light sources and patch cords sold separately.

New! SV225/10PAK
- Pack of 10 stray voltage adapters
- Adapter makes sure meter has low input impedance that eliminates stray voltage

Pressure and vacuum

New! SV350 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

For more information and detailed specifications, go to www.fluke.com/accessories
### AC current clamp specifications

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<tr>
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<th>Model</th>
<th>Amperage Ranges</th>
<th>AC Range</th>
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<td>CAT III 600 V</td>
<td>i1000s</td>
<td>1 A to 200 A to 3 A to 600 A</td>
<td>1 A to 200 A</td>
<td>1 A to 200 A</td>
<td>1 A to 200 A</td>
</tr>
</tbody>
</table>

### Other Models

- **ScopeMeter** 123/124, 125/126, 127/128
- **i2000**
- **i3000s**
- **AC only models**

For more information and detailed specifications, go to www.fluke.com/accessories
## AC/DC Current Clamp Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>DC Range</th>
<th>AC Range</th>
<th>Accuracy</th>
<th>Bandwidth</th>
<th>Zero Error Adjust</th>
<th>Maximum Conductor Diameter</th>
<th>Maximum Conductor Size</th>
<th>Output Levels</th>
<th>Battery Life</th>
<th>Warranty</th>
<th>Safety</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>80i-110s</td>
<td>0.1 A to 100 A</td>
<td>0.1 A to 70 A</td>
<td>± 3 % to 10 A, ± 0.5 % from dc to 1 kHz</td>
<td>100 kHz</td>
<td>Yes</td>
<td>11.8 mm (0.46 in)</td>
<td>1 AWG</td>
<td>10 mV/A, 100 mV/A</td>
<td>40 hours</td>
<td>One-year</td>
<td>CAT III 600 V; CAT III 300 V</td>
<td></td>
</tr>
<tr>
<td>i10</td>
<td>1 A to 600 A</td>
<td>1 A to 600 A</td>
<td>± 1 % + 2 % from dc or ac</td>
<td>3 kHz</td>
<td>Yes</td>
<td>30 mm (1.18 in)</td>
<td>100 MCM or 2-500 MCM</td>
<td>1 mV/A</td>
<td>60 hours</td>
<td>One-year</td>
<td>CAT III 600 V</td>
<td></td>
</tr>
<tr>
<td>i1010</td>
<td>2 A to 600 A</td>
<td>2 A to 600 A</td>
<td>± 0.5 % from dc or ac (45 to 400 Hz)</td>
<td>10 kHz</td>
<td>Yes</td>
<td>30 mm (1.18 in)</td>
<td>100 MCM or 2-500 MCM</td>
<td>100 mV/A</td>
<td>60 hours</td>
<td>One-year</td>
<td>CAT III 600 V</td>
<td></td>
</tr>
<tr>
<td>i30</td>
<td>4 mA to 10 A</td>
<td>4 mA to 20 A</td>
<td>± 1 % ± 2 mA</td>
<td>dc to 20 kHz</td>
<td>Yes</td>
<td>30 mm (1.18 in)</td>
<td>100 MCM</td>
<td>1 mV/A</td>
<td>30 hours</td>
<td>One-year</td>
<td>CAT III 300 V</td>
<td></td>
</tr>
<tr>
<td>i5sPQ3</td>
<td>4 mA to 100 A</td>
<td>4 mA to 20 A</td>
<td>± 1 % ± 2 mA</td>
<td>dc to 100 kHz</td>
<td>Yes</td>
<td>19 mm (0.75 in)</td>
<td>100 MCM</td>
<td>100 mV/A</td>
<td>30 hours</td>
<td>One-year</td>
<td>CAT III 300 V</td>
<td></td>
</tr>
</tbody>
</table>

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

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

**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.

**Hot probes with cool designs**

**Soft rubber handle provides a secure grip**

**Cleans up with soap and water**

**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, choose the correct probe from the selection guide below.

<table>
<thead>
<tr>
<th>SureGrip probes</th>
<th>SOKE</th>
<th>SOPK-1</th>
<th>SOPK-11</th>
<th>SOPK-22</th>
<th>SOPK-3A</th>
<th>SOPK-24</th>
<th>SOPK-25</th>
<th>SOPK-25</th>
<th>SOPK-26</th>
<th>SOPK-27</th>
<th>SOPK-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe length</td>
<td>1 m Lead Wire</td>
<td>19 m Velcro cuff</td>
<td>21.27 cm (8.375 in)</td>
<td>9.525 cm (3.75 in)</td>
<td>21.59 cm (8.5 in)</td>
<td>10.16 cm (4 in)</td>
<td>21.57 cm (8.5 in)</td>
<td>20.32 cm (8 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>1 m (39 in)</td>
<td>1.3 m (4 ft)</td>
<td>1 m (39 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key feature</td>
<td>Ideal for initial troubleshooting. Can be secured in place with a magnet.</td>
<td>Velcro probe allows hands free temperature measurement.</td>
<td>For use in liquids or gums.</td>
<td>Exposed junction for direct contact with flat or slightly convex surfaces.</td>
<td>Perforated baffle for air and non-caustic gas measurements.</td>
<td>Probe material safe for use in foods. Sharp tip pieces solid surfaces.</td>
<td>Use for general purpose air or surface measurements.</td>
<td>Low conductivity stainless steel minimizes thermal shunting. Extra rugged.</td>
<td>Clamps securely to pipe. Measurements are repeatable to 0.06 °C (1 °F).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermocouple types</td>
<td>K</td>
<td>K, J</td>
<td>K</td>
<td>K, T</td>
<td>K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Use an 80AC 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 adapter is necessary for thermocouple types K, J, T and E.

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

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

**Accessories**
Fluke Temperature accessories

Turn your digital multimeter into a thermometer

Other temperature accessories

**80FK 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)

**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 psig / -85 bar or pressures to 30 psig/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 psig / -0.8 bar or pressure to 600 psig/25 bar.

**700HYP Hydraulic Test Pump**
The 700HYP is designed to generate pressures up to 10,000 psig/700 bar. Use the Fluke-700HYP 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 700HYP hydraulic test pump.

**700MMP Pressure Pump**
The 700MMP is a hand-operated pressure pump to provide pressures up to 150 psig/1000 KPa. Output fitting is 1/8 NPT.

**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

<table>
<thead>
<tr>
<th>Premium cases</th>
<th>Soft cases</th>
<th>Hard cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>C520A</td>
<td>C90</td>
<td>C789</td>
</tr>
<tr>
<td>C510</td>
<td>C91</td>
<td>C20</td>
</tr>
<tr>
<td>C25</td>
<td>C12A</td>
<td>C101</td>
</tr>
<tr>
<td>C50</td>
<td>C12B</td>
<td></td>
</tr>
<tr>
<td>C90</td>
<td>C12C</td>
<td></td>
</tr>
<tr>
<td>C125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C789</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C101</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions**
- **C520A**: 22.5 cm x 7.0 cm x 4.8 cm (8 in x 2.75 in x 1.9 in)
- **C510**: 20.3 cm x 11.3 cm x 6.0 cm (8 in x 4.5 in x 2.4 in)
- **C25**: 19.2 cm x 11.1 cm x 9.5 cm (7.5 in x 3.6 in x 3.7 in)
- **C90**: 19.2 cm x 7.9 cm x 5.6 cm (7.5 in x 3.0 in x 2.5 in)
- **C12A**: 18.9 cm x 11.2 cm x 6.0 cm (7.4 in x 4.4 in x 2.4 in)
- **C12B**: 16.7 cm x 13.5 cm x 5.6 cm (6.6 in x 5.3 in x 2.2 in)
- **C12C**: 15.0 cm x 11.2 cm x 5.6 cm (5.9 in x 4.4 in x 2.2 in)
- **C63**: 12.5 cm x 13.5 cm x 5.6 cm (5.0 in x 5.3 in x 2.2 in)
- **C789**: 11.0 cm x 11.2 cm x 5.0 cm (4.3 in x 4.4 in x 2.0 in)
- **C20**: 9.0 cm x 13.2 cm x 5.0 cm (3.6 in x 5.2 in x 2.0 in)
- **C101**: 9.0 cm x 13.2 cm x 5.0 cm (3.6 in x 5.2 in x 2.0 in)

**DMMs**
- 30/11/2/128
- 310/110/112
- 33/33
- 27/23/28/75/77/79
- 17
- 50/73 III
- 125/177
- 179
- 57/86/87
- 57/86/89
- 57/87 Series V
- 387/389
- 386/387

**Clamp meters**
- 321/322

**ScopeMeters**
- 123/124

**Power quality**
- 204/12

**Process tools**
- 705/707
- 714/713
- 714/716/717
- 728
- 731/743/744
- 787
- 788

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

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

**HSOM 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.

<table>
<thead>
<tr>
<th>Model</th>
<th>Fuse requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>21/23/75/77-II</td>
<td>P/N 871173; 630 mA 250 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>21-III/75-III/73-III</td>
<td>P/N 871173; 630 mA 250 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 803293; 11 A 1000 V fuse</td>
</tr>
<tr>
<td>76/79-III/83/85/88 (S/N &lt; 65650001)</td>
<td>P/N 871207; 1 A 600 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>25/27 (S/N &lt; 7247001)</td>
<td>P/N 871202; 3 A 600 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 892583; 15A 600 V fuse</td>
</tr>
<tr>
<td>27 (S/N &gt; 7247001)</td>
<td>P/N 943121; 440 mA 1000 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 803293; 11 A 1000 V fuse</td>
</tr>
<tr>
<td>45 (S/N &lt; 7211001)</td>
<td>P/N 871181; 500 mA 250 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>45 (S/N &gt; 7211001)</td>
<td>P/N 871181; 500 mA 250 V fuse</td>
</tr>
<tr>
<td></td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>73 and 73-II</td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>863/865/867/867B</td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>83/85/87 (S/N &gt; 65650001)</td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>87/IV-89-I/IV/187/189/</td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>85-III/86-III/87-III/87-E-III/83V/87V</td>
<td>P/N 892583; 15 A 600 V fuse</td>
</tr>
<tr>
<td>111/112</td>
<td>P/N 803293; 11 A 1000 V fuse</td>
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<tr>
<td>712/713/714/715/716/717/718</td>
<td>P/N 686657; 125 mA 250 V fuse</td>
</tr>
<tr>
<td>724/725</td>
<td>P/N 2002234 (qty. 1); 50 mA 250 V fuse</td>
</tr>
<tr>
<td>157/1587</td>
<td>P/N 892583; 440 mA 1000 V fuse</td>
</tr>
<tr>
<td>1503/1507</td>
<td>P/N 2279339; 315 mA, 1000 V fuse</td>
</tr>
</tbody>
</table>

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

Fluke 117 Electrician’s Digital Multimeter
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.
• 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”.
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
• CO₂
• CO
For more information see page 54.

Fluke 8845A and 8846A 6.5 Digit Precision Multimeters
• 6.5 digit resolution
• Graphical display
• Basic V dc accuracy of up to 0.0024 %
• 100 uA to 10 A Current
• 10 ohm to 1 Gohm resistance
• 2x4 Wire ohms measurement technique
• Frequency, period, capacitance and RTD temperature measurements
• Analytical modes, “TrendPlot™” Histogram and Statistics
• USB device port, for memory storage devices
• RS-232, IEEE-488 and LAN interfaces
For more information, see page 21.