LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke’s behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Fluke Corporation
P.O. Box 9090
Everett, WA 98206-9090
U.S.A.

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

11/99

Service Centers:

Fluke Beijing Service Center
Room 401 SCITEC Tower
Jianguomenwai Dajie
Beijing 100004, PRC
Tel: 400-810-3435

Shanghai Shilu Instrument Co., Ltd.
#139, Lane 2638, Hongmei Road (South)
Shanghai 201108
Standard Number: Q/SXAV 1-2002
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Introduction
The Fluke 15B+/17B+/18B+ Multimeters (the Product) are 4000 count instruments. The Product is battery powered with a digital display.

Except where noted, the descriptions and instructions in this Users Manual apply to all of 15B+/17B+/18B+.

Unless otherwise identified, all illustrations show the 17B+.

How to Contact Fluke
To contact Fluke, call one of the following telephone numbers:
• Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
• Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
• Canada: 1-800-36-FLUKE (1-800-363-5853)
• Europe: +31 402-675-200
• Japan: +81-03-6714-3114
• Singapore: +65-6799-5566
• Mainland China: +86-400-810-3435
• Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.


To see, print, or download the latest manual supplement, visit http://us.fluke.com/usen/support/manuals.
Safety Information

A Warning identifies conditions and procedures that are dangerous to the user. A Caution identifies conditions and procedures that could cause damage to the Product or the equipment under test.

International electrical symbols used on the Product and in this manual are explained in Table 1.

Review the safety information and comply with the safe working practices.

⚠️⚠️ Warning

To prevent possible electrical shock, fire, or personal injury:

- Carefully read all instructions.
- Read all safety information before you use the Product.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Examine the case before you use the Product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.
- Do not use the Product if it is damaged.
- Do not use the Product if it operates incorrectly.
- Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame-resistant clothes) to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Use only correct measurement category (CAT), voltage, and amperage rated probes, test leads, and adapters for the measurement.
- Do not use test probes in CAT III environments without the protective cap installed. The protective cap decreases the exposed probe metal to <4mm. This decreases the possibility of arc flash from short circuits.
- Measure a known voltage first to make sure that the Product operates correctly.
- Limit operation to the specified measurement category, voltage, or amperage ratings.
• Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.

• Do not touch voltages > 30 V ac rms, 42 V ac peak, or 60 V dc.

• Do not use test leads if they are damaged. Examine the test leads for damaged insulation and measure a known voltage.

• Connect the common test lead before the live test lead and remove the live test lead before the common test lead.

• Keep fingers behind the finger guards on the probes.

• Remove all probes, test leads, and accessories before the battery door is opened.

• Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.

• Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures above 50 °C. If the batteries are not removed, battery leakage can damage the Product.

• Replace the batteries when the low battery indicator (udades) shows to prevent incorrect measurements.

• Use the correct terminals, function, and range for measurements.

• Disconnect all test leads from any hazardous voltage before switching to the LED TEST function. Refer to the LED TEST section for proper measurement technique and interpretation of results (for 18B+ only).
Table 1. International Electrical Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td>AC (Alternating Current)</td>
</tr>
<tr>
<td>⚡</td>
<td>Earth Ground</td>
</tr>
<tr>
<td>---</td>
<td>DC (Direct Current)</td>
</tr>
<tr>
<td>☢️</td>
<td>Fuse</td>
</tr>
<tr>
<td>⌨️</td>
<td>Capacitance</td>
</tr>
<tr>
<td>⚠️</td>
<td>Hazardous voltage. Risk of electrical shock.</td>
</tr>
<tr>
<td>☢️</td>
<td>Battery</td>
</tr>
<tr>
<td>CAT II</td>
<td>MEASUREMENT CATEGORY II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low voltage MAINS installation.</td>
</tr>
<tr>
<td>CAT III</td>
<td>MEASUREMENT CATEGORY III is applicable to test and measuring circuits connected to the distribution part of the building’s low-voltage MAINS installation.</td>
</tr>
<tr>
<td>CAT IV</td>
<td>MEASUREMENT CATEGORY IV is applicable to test and measuring circuits connected at the source of the building’s low voltage MAINS installation.</td>
</tr>
<tr>
<td>⚡️</td>
<td>Conforms to European Union directives.</td>
</tr>
<tr>
<td>⚡️</td>
<td>Conforms to relevant North American Safety Standards.</td>
</tr>
<tr>
<td>⚡️</td>
<td>Conforms to relevant South Korean EMC Standards.</td>
</tr>
<tr>
<td>⚡️</td>
<td>Conforms to relevant Australian Standards.</td>
</tr>
<tr>
<td>⚡️</td>
<td>This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 &quot;Monitoring and Control Instrumentation&quot; product. Do not dispose of this product as unsorted municipal waste. Go to Fluke’s website for recycling information.</td>
</tr>
</tbody>
</table>
**Instrument Overview**

**Terminals**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input terminal for ac and dc current measurement to 10 A and frequency (17B+/18B+) measurements.</td>
</tr>
<tr>
<td>2</td>
<td>Input terminal for ac and dc microamp and milliamp measurements to 400 mA and frequency (17B+/18B+) measurements.</td>
</tr>
<tr>
<td>3</td>
<td>Common (return) terminal for all measurements.</td>
</tr>
<tr>
<td>4</td>
<td>Input terminal for voltage, resistance, continuity, diode, capacitance, frequency (17B+/18B+), duty cycle (17B+/18B+), temperature (17B+ only), and LED test (18B+ only) measurements.</td>
</tr>
</tbody>
</table>
Display

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relative measurement is enabled (17B+ only).</td>
<td>9</td>
<td>Duty cycle is selected (17B+/18B+).</td>
</tr>
<tr>
<td>2</td>
<td>High voltage</td>
<td>10</td>
<td>Resistance or Frequency (17B+/18B+) is selected.</td>
</tr>
<tr>
<td>3</td>
<td>Continuity is selected.</td>
<td>11</td>
<td>Farads for capacitance.</td>
</tr>
<tr>
<td>4</td>
<td>Display Hold is enabled.</td>
<td>12</td>
<td>millivolts or volts</td>
</tr>
<tr>
<td>5</td>
<td>MIN or MAX mode is enabled (17B+ only).</td>
<td>13</td>
<td>dc or ac voltage or current</td>
</tr>
<tr>
<td>6</td>
<td>LED test is enabled (18B+ only).</td>
<td>14</td>
<td>microamp, milliamp, or amp</td>
</tr>
<tr>
<td>7</td>
<td>Fahrenheit or Celsius is selected (17B+ only).</td>
<td>15</td>
<td>Auto range mode or Manual range mode is enabled.</td>
</tr>
<tr>
<td>8</td>
<td>Diode test is selected.</td>
<td>16</td>
<td>Battery is low and should be replaced.</td>
</tr>
</tbody>
</table>
**Auto Power Off**

The Product automatically powers off after 20 minutes of inactivity.

To restart the Product, turn the rotary switch back to the OFF position and then to a necessary position.

To disable the Auto Power Off function, hold down \( \Delta \) when turning on the Product, until PoFF shows on the display.

*Note*

When you disable the Auto Power Off function, LoFF also shows on the display. The Auto Backlight Off function is also disabled.

**Auto Backlight Off**

The backlight automatically turns off after 2 minutes of inactivity.

To disable the Auto Backlight Off function, hold down when turning on the Product, until LoFF shows on the display.

**Measurements**

⚠️ **Warning**

To prevent possible electrical shock, fire, or personal injury, disconnect power and discharge all high-voltage capacitors before you measure resistance, continuity, capacitance, or a diode junction.

**Manual and Auto Range Selection**

The Product has both manual and auto range options. In the auto range mode, the Product selects the best range for the input detected. This allows you to switch test points without having to reset the range. You can override auto ranging by selecting the range manually.

By default, the Product uses the auto range mode in measurement functions that have more than one range and shows Auto Range on the display.

To enter the manual range mode, push \( \text{[Range]} \).

*Note*

Each push of \( \text{[Range]} \) increments the range. When the highest range is reached, the Meter wraps to the lowest range.

To exit the manual range mode, push and hold \( \text{[Range]} \) for two seconds.
Data Hold

⚠⚠ Warning

To prevent possible electrical shock, fire or personal injury, do not use the HOLD function to measure unknown potentials. When HOLD is turned on, the display does not change when a different potential is measured.

To hold the present reading, push \text{HOLD}. Push \text{HOLD} again to resume normal operation.

Relative Measurements (17B+ only)

The Product allows relative measurements for all functions except frequency, resistance, continuity, duty cycle, and diode.

To do relative measurements:

1. With the Product in the desired function, touch the test leads to the circuit on which you want future measurements to be based.
2. Push \text{REL} to store the measured reading as the reference value and activate the relative measurement mode.
3. Push \text{HOLD} for to return to normal operation.

MIN MAX Mode (17B+ Only)

To set the Product to MIN MAX mode (available for all functions except resistance, capacitance, frequency, duty cycle, and diode):

1. Push \text{MINMAX} once to set the Product to MAX mode.
2. Push \text{MINMAX} again to set the Product to MIN mode.
3. Push \text{MINMAX} for 2 seconds to return to normal operation.
Measure AC and DC Voltage

To measure ac and dc voltage:

1. Turn the rotary switch to \( V \), \( V \), or \( mV \) to choose ac or dc.

2. Push \( \Delta \) to toggle between mVac or mVdc voltage measurement.

3. Connect the red test lead to the \( V \) terminal and the black test lead to the COM terminal.

4. Touch the probes to the correct test points of the circuit to measure the voltage, as shown in Figure 1.

5. Read the measured voltage on the display.
Measure AC or DC Current

⚠️ ⚠️ Warning
To prevent possible electrical shock, fire, or personal injury, remove circuit power before you connect the Product in the circuit when you measure current. Connect the Product in series with the circuit.

To measure ac or dc current:

1. Turn the rotary switch to $\text{A}$, $\text{mA}$, or $\text{μA}$.
2. Push to toggle between ac or dc current measurement.
3. Connect the red test lead to the $\text{A}$ or $\text{mA}$ $\mu\text{A}$ terminal based on the current to be measured and connect the black test lead to the COM terminal. See Figure 2.
4. Break the circuit path to be measured. Then connect the test leads across the break and apply power.
5. Read the measured current on the display.

Figure 2. Measure AC and DC Current
**Measure Resistance**

To measure resistance:

1. Turn the rotary switch to $\Omega$. Make sure power is disconnected from the circuit to be measured.

2. Connect the red test lead to the $\Omega$ terminal and the black test lead to the COM terminal, as shown in Figure 3.

3. Measure the resistance by touching the probes to the desired test points of the circuit.

4. Read the measured resistance on the display.

**Test for Continuity**

To test for continuity:

With the resistance mode selected, push $\Delta$ once to activate the continuity beeper. If the resistance is $<70 \, \Omega$, the beeper will sound continuously, designating a short circuit. See Figure 3.
Test Diodes

⚠️ Caution
To prevent possible damage to the Product or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before you test diodes.

1. Turn the rotary switch to \( \Omega \).
2. Push \( \Delta \) twice to activate Diode Test.
3. Connect the red test lead to the \( \Omega \) terminal and the black test lead to the COM terminal.
4. Connect the red probe to the anode side and the black test lead to the cathode side of the diode being tested.
5. Read the forward bias voltage value on the display.
6. If the polarity of the test leads is reversed with diode polarity, the display reading shows \( \Omega \). This can be used to distinguish the anode and cathode sides of a diode.

Measure Capacitance

⚠️ Caution
To prevent damage to the Product, disconnect circuit power and discharge all high-voltage capacitors before you measure capacitance.

1. Turn the rotary switch to \( \Omega \).
2. Connect the red test lead to the \( \Omega \) terminal and the black test lead to the COM terminal.
3. Touch the probes to the capacitor leads.
4. After allowing the reading to stabilize (up to 18 seconds), read the capacitance value on the display.

Measure Temperature (17B+ only)
To measure temperature:
1. Turn the rotary switch to °.
2. Plug the thermocouple into the \( \Omega \) and COM terminals of the Product.
   Ensure that the thermocouple plug marked with “+” is inserted into the \( \Omega \) terminal on the Product.
3. Read the temperature on the display.
4. Push \( \Delta \) to switch between °C and °F.
**Measure Frequency and Duty Cycle (17B+/18B+ Only)**

The Product can measure frequency or duty cycle while making either a voltage or a current measurement. Push \( \text{Hz} \% \) to change the Product to frequency or duty cycle.

1. When the Product is in the required function (ac voltage or ac current), push \( \text{Hz} \% \).
2. Read the frequency of the signal on the display.
3. To make a duty cycle measurement, push \( \text{Hz} \% \) again.
4. Read the percent of duty cycle on the display.

**Test LEDs (18B+ Only)**

⚠️ Caution

To prevent possible damage to the Product or to the equipment under test, disconnect all test leads from any hazardous voltage before you switch to the LED TEST function.

The Product tests Light Emitting Diodes (LEDs) either through the LED test socket on the Meter or through the test leads.

**Note**

*Do not use the LED Test mode to do LED aging tests.*

To test an LED mounted in the test socket:

1. Turn the rotary switch to LED TEST.
2. Place the leads of the LED into the holes of the LED test socket on the front of the Meter as shown in Figure 4.
If the LED is good, the Product will illuminate the LED under test and an anode indicator will illuminate to indicate the (+) pin. If the LED is broken, the LED will not illuminate and neither of the anode indicators will illuminate. If the LED is a short circuit, the LED will not illuminate, and both anode indicators will illuminate.

![Figure 4. LED Test Sockets](hpq07.png)

**Maintenance**

Beyond replacing batteries and fuses, do not attempt to repair or service the Product unless you are qualified to do so and have the relevant calibration, performance test, and service instructions. The recommended calibration cycle is 12 months.

⚠️ ⚠️ **Warning**

To prevent possible electrical shock, fire, or personal injury:

- Remove the input signals before you clean the Product.
- Use only specified replacement fuses.
- Have an approved technician repair the Product.

For safe operation and maintenance of the Product:

- Repair the Product before use if the batteries leak.
- Batteries contain hazardous chemicals that can cause burns or explode. If exposure to chemicals occurs, clean with water and get medical aid.
**General Maintenance**

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.

To clean the terminals:

1. Turn the Product off and remove the test leads.
2. Shake out any dirt that may be in the terminals.
3. Soak a new swab with isopropyl alcohol and work around the inside of each input terminal.

**Test Fuses**

⚠️⚠️ **Warning**

To prevent electric shock or injury, remove the test leads and any input signals before replacing the fuses.

1. Turn the rotary switch to \( \Omega \).
2. Plug a test lead into the \( \Omega \) terminal and touch the probe to the A or mA \( \mu A \) terminal.
   - A good A terminal fuse reads approximately 0.1 \( \Omega \). A good mA/\( \mu A \) terminal fuse reads less than 10 k\( \Omega \).
   - If the display reads \( \Omega \text{L} \), replace the fuse and test again.
   - If the display shows any other value, have the Product serviced. See “Service and Parts”.
**Replace Batteries and Fuses**

**⚠️ Warning**

To prevent false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the battery indicator (▼) appears.

To prevent damage or injury, install ONLY replacement fuses with the specified amperage, voltage, and interrupt ratings.

Disconnect test leads before opening the case or the battery door.

To replace the batteries or the fuses, see Figure 5.

---

**Figure 5. Replace Batteries and Fuses**
**Service and Parts**

If the Product fails, first check the batteries and fuse, and then review this manual to make sure that you are operating the Product correctly.

Replacement parts are listed in Table 2.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery, NEDA 15A, IEC LR6</td>
<td>376756</td>
</tr>
<tr>
<td>Battery door assembly, English</td>
<td>4413666</td>
</tr>
<tr>
<td>Battery door assembly, Chinese</td>
<td>4413653</td>
</tr>
<tr>
<td>TL75-4201, test teads with two caps</td>
<td>4306653</td>
</tr>
<tr>
<td>Fuse, 0.440 A, 1000 V, FAST</td>
<td>943121</td>
</tr>
<tr>
<td>Fuse, 11A, 1000 V, FAST</td>
<td>803293</td>
</tr>
<tr>
<td>Holster</td>
<td>4368113</td>
</tr>
</tbody>
</table>

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- China: +86-10-6512-3435 or +86-400-810-3435
- Europe: +31 402-675-200
- Japan: +81-03-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Visit Fluke’s Web site at [www.fluke.com](http://www.fluke.com).
15B+/17B+/18B+
Users Manual

General Specifications

Maximum voltage between any Terminal and Earth Ground: 1000 V
Display (LCD): 4000 counts, updates 3/sec
Battery Type: 2 AA, NEDA 15A, IEC LR6
Battery Life: 500 hours minimum (50 hours in LED Test mode without load. The hours with load depends on the type of LED under test.)

Temperature
Operating: 0 °C to 40 °C
Storage: -30 °C to 60 °C

Relative Humidity
Operating Humidity: Non-condensing ≤90 % at 10 °C to 30 °C; ≤75 % at 30 °C to 40 °C
Operating Humidity, 40 MΩ Range: ≤80 % at 10 °C to 30 °C; ≤70 % at 30 °C to 40 °C

Altitude
Operating: 2000 m
Storage: 12,000 m

Temperature Coefficient: 0.1 X (specified accuracy) /°C (<18 °C or >28 °C)
Fuse protection for current inputs: 440 mA, 1000 V Fast Fuse, Fluke specified part only.
11A, 1000V Fast Fuse, Fluke specified part only.

Size (HxWxL): 183 x 91 x 49.5 (mm)
Weight: 455 g
IP Rating: IP 40

Safety: IEC 61010-1, IEC61010-2-030 600 V CAT III, 1000 V CAT II, Pollution Degree 2
Electromagnetic Environment: IEC 61326-1: Portable
Electromagnetic Compatibility: Applies to use in Korea only.

[1] This product meets requirements for industrial (Class A) electromagnetic wave equipment and seller or user should take notice of it. This equipment is intended for use in business environments and is not to be used in homes.
**Accuracy Specifications**

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, relative humidity at 0 % to 75 %. Accuracy specifications take the form of: ±([% of Reading] + [Number of Least Significant Digits]).

### AC and DC Voltage

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Volts (40 Hz – 500 Hz)[1]</td>
<td>4.000 V</td>
<td>0.001 V</td>
<td>1.0 % + 3</td>
</tr>
<tr>
<td></td>
<td>40.00 V</td>
<td>0.01 V</td>
<td>1.0 % + 3</td>
</tr>
<tr>
<td></td>
<td>400.0 V</td>
<td>0.1 V</td>
<td>1.0 % + 3</td>
</tr>
<tr>
<td></td>
<td>1000 V</td>
<td>1 V</td>
<td>1.0 % + 3</td>
</tr>
<tr>
<td>AC Millivolts</td>
<td>400.0 mV</td>
<td>0.1 mV</td>
<td>3.0 % + 3</td>
</tr>
<tr>
<td>DC Millivolts</td>
<td>400.0 mV</td>
<td>0.1 mV</td>
<td>1.0 % + 10</td>
</tr>
<tr>
<td>DC Volts</td>
<td>4.000 V</td>
<td>0.001 V</td>
<td>0.5 % + 3</td>
</tr>
<tr>
<td></td>
<td>40.00 V</td>
<td>0.01 V</td>
<td>0.5 % + 3</td>
</tr>
<tr>
<td></td>
<td>400.0 V</td>
<td>0.1 V</td>
<td>0.5 % + 3</td>
</tr>
<tr>
<td></td>
<td>1000 V</td>
<td>1 V</td>
<td>0.5 % + 3</td>
</tr>
</tbody>
</table>

[1] All ac, Hz, and duty cycle are specified from 1 % to 100 % of range. Inputs below 1 % of range are not specified.
## AC and DC Current

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Current μA (40 Hz – 400 Hz)</td>
<td>400.0 μA 4000 μA</td>
<td>0.1 μA 1 μA</td>
<td>1.5% + 3</td>
</tr>
<tr>
<td>AC current mA (40 Hz – 400 Hz)</td>
<td>40.00 mA 400.0 mA</td>
<td>0.01 mA 0.1 mA</td>
<td>1.5% + 3</td>
</tr>
<tr>
<td>AC current A[^1] (40 Hz – 400 Hz)</td>
<td>4.000 A 10.00 A</td>
<td>0.001 A 0.01 A</td>
<td>1.5% + 3</td>
</tr>
<tr>
<td>DC current μA</td>
<td>400.0 μA 4000 μA</td>
<td>0.1 μA 1 μA</td>
<td>1.5% + 3</td>
</tr>
<tr>
<td>DC current mA</td>
<td>40.00 mA 400.0 mA</td>
<td>0.01 mA 0.1 mA</td>
<td>1.5% + 3</td>
</tr>
<tr>
<td>DC current A[^1]</td>
<td>4.000 A 10.00 A</td>
<td>0.001 A 0.01 A</td>
<td>1.5% + 3</td>
</tr>
</tbody>
</table>

[^1]: 10 A duty cycle <7 minutes on, 20 minutes off.
### Diode Test, Temperature, Resistance, Capacitance, Frequency, and Duty Cycle

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diode Test(^{(1)})</td>
<td>2.000 V</td>
<td>0.001 V</td>
<td>10 %</td>
</tr>
<tr>
<td>Temperature</td>
<td>50.0 °C – 400.0 °C</td>
<td>0.1 °C</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>0 °C – 50.0 °C</td>
<td></td>
<td>2 °C +1 °C</td>
</tr>
<tr>
<td></td>
<td>-55.0 °C – 0 °C</td>
<td></td>
<td>9 % +2 °C</td>
</tr>
<tr>
<td>Resistance (Ohms)</td>
<td>400.0 Ω</td>
<td>0.1 Ω</td>
<td>0.5 % + 3</td>
</tr>
<tr>
<td></td>
<td>4.000 kΩ</td>
<td>0.001 kΩ</td>
<td>0.5 % + 2</td>
</tr>
<tr>
<td></td>
<td>40.00 kΩ</td>
<td>0.01 kΩ</td>
<td>0.5 % + 2</td>
</tr>
<tr>
<td></td>
<td>400.0 MΩ</td>
<td>0.001 MΩ</td>
<td>0.5 % + 2</td>
</tr>
<tr>
<td></td>
<td>40.00 MΩ</td>
<td>0.01 MΩ</td>
<td>1.5% + 3</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Test accuracy is valid only when the test current is less than 10 mA.
### Capacitance[^2]

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.00 nF</td>
<td>0.01 nF</td>
<td>2 % + 5</td>
</tr>
<tr>
<td></td>
<td>400.0 nF</td>
<td>0.1 nF</td>
<td>2 % + 5</td>
</tr>
<tr>
<td></td>
<td>4.000 μF</td>
<td>0.001 μF</td>
<td>5 % + 5</td>
</tr>
<tr>
<td></td>
<td>40.00 μF</td>
<td>0.01 μF</td>
<td>5 % + 5</td>
</tr>
<tr>
<td></td>
<td>400.0 μF</td>
<td>0.1 μF</td>
<td>5 % + 5</td>
</tr>
<tr>
<td></td>
<td>1000 μF</td>
<td>1 μF</td>
<td>5 % + 5</td>
</tr>
</tbody>
</table>

[^2]: Specifications do not include errors due to test lead capacitance and capacitance floor (may be up to 1.5 nF in the 40 nF range).

### Frequency[^3]

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50.00 Hz</td>
<td>0.01 Hz</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>500.0 Hz</td>
<td>0.1 Hz</td>
<td>0.1 % + 3</td>
</tr>
<tr>
<td></td>
<td>5.000 kHz</td>
<td>0.001 kHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50.00 kHz</td>
<td>0.01 kHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0 kHz</td>
<td>0.1 kHz</td>
<td></td>
</tr>
</tbody>
</table>

[^3]: All ac, Hz, and duty cycle are specified from 1 % to 100 % of range. Inputs below 1 % of range are not specified.

### Duty Cycle[^2]

<table>
<thead>
<tr>
<th>Function</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 % to 99 %</td>
<td>0.1 %</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 % typical[^4]</td>
</tr>
</tbody>
</table>

[^2]: Typically, open circuit test voltage is 2.0 V and short circuit current is <0.6 mA.

[^4]: Typical means when the frequency is at 50 Hz or 60 Hz and the duty cycle is between 10 % and 90 %.
## Digital Multimeters
### Accuracy Specifications

#### LED Test and Continuity Threshold

<table>
<thead>
<tr>
<th>Function</th>
<th>Lighting Range</th>
<th>Measurement Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED V&lt;sub&gt;f&lt;/sub&gt; Test &lt;sup&gt;[1]&lt;/sup&gt; (LED Test Socket)</td>
<td>1.00 to 6.00 V</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>LED V&lt;sub&gt;f&lt;/sub&gt; Test &lt;sup&gt;[2]&lt;/sup&gt; (Test Leads)</td>
<td>1.00 to 6.00 V</td>
<td>1.00 to 6.00 V</td>
<td>0.01 V</td>
<td>10 % &lt;sup&gt;[3]&lt;/sup&gt;</td>
</tr>
<tr>
<td>Continuity Threshold</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>70 Ω</td>
</tr>
</tbody>
</table>

<sup>[1]</sup> Open circuit test voltage is ±12 V and short-circuit current is <±5 mA (typical).
<sup>[2]</sup> Open circuit test voltage is ±12 V and short-circuit current is <±3 mA (typical).
<sup>[3]</sup> V<sub>f</sub> measurement with driving current under 2.2 ±0.4 mA.

#### Input Characteristics

<table>
<thead>
<tr>
<th>Function</th>
<th>Overload Protection</th>
<th>Input Impedance (Nominal)</th>
<th>Common Mode Rejection Ratio</th>
<th>Normal Mode Rejection Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Volts</td>
<td>1000 V &lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>&gt;10 MΩ, &lt;100 pF</td>
<td>&gt;60 dB at dc, 50 Hz or 60 Hz</td>
<td></td>
</tr>
<tr>
<td>AC Millivolts</td>
<td>400 mV</td>
<td>&gt;=1MΩ, &lt;100pF</td>
<td>&gt;80 dB at dc, 50 Hz or 60 Hz</td>
<td></td>
</tr>
<tr>
<td>DC Volts</td>
<td>1000 V &lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>&gt;10 MΩ, &lt;100 pF</td>
<td>&gt;100 dB at dc, 50 Hz or 60 Hz</td>
<td>&gt;60 dB at 50 Hz or 60 Hz</td>
</tr>
<tr>
<td>DC Millivolts</td>
<td>400 mV</td>
<td>&gt;=1MΩ, &lt;100pF</td>
<td>&gt;80 dB at dc, 50 Hz or 60 Hz</td>
<td></td>
</tr>
</tbody>
</table>

<sup>[1]</sup> 10<sup>7</sup> V Hz Max
15B+/17B+/18B+
Users Manual