

[Manuals.plus](#) /

› [B&K Precision](#) /

› B&K Precision 5491B True RMS Bench Digital Multimeter User Manual

## B&K Precision 5491B

# B&K Precision 5491B True RMS Bench Digital Multimeter

Model: 5491B | Brand: B&K Precision

## 1. INTRODUCTION

---

The B&K Precision 5491B is a high-performance, 50,000-count true RMS benchtop digital multimeter designed for precise measurements in various electrical and electronic applications. It is suitable for research and development, production-line testing, and educational purposes. This manual provides essential information for the safe and effective operation of your multimeter.

### 1.1 Key Features

- Measures voltage, current, frequency, period, resistance, and continuity.
- True RMS measurement for accurate readings on linear and nonlinear loads.
- Dual LCD display showing two readings simultaneously with 50,000 count resolution.
- USB and RS-232 interfaces for data transfer and remote operation.
- Supports dB, dBm, relative mode, hold function, and pass/fail testing.
- Meets IEC safety standard 61010 for Category I (1000V) and Category II (300V) installations.

### 1.2 What's in the Box?

- B&K 5491B bench-top digital multimeter
- Set of test leads
- Spare fuse
- Calibration certificate and test report
- 110/220V power cord
- Instructions (this manual)

## 2. SAFETY INFORMATION

---

Always observe standard safety precautions when operating this device to avoid personal injury or damage to the meter or equipment under test. This meter is designed to meet International Electrotechnical Commission (IEC) safety standard

61010 and is certified for Category I installations up to 1000V and Category II installations up to 300V.

- Do not apply more than the rated voltage, as marked on the meter, between terminals or between any terminal and earth ground.
- Use caution when working with voltages above 30V AC RMS, 42V peak, or 60V DC. These voltages pose a shock hazard.
- Before making resistance or continuity measurements, disconnect power to the circuit and discharge all high-voltage capacitors.
- Ensure the correct function and range are selected before connecting the test leads to the circuit.
- Inspect test leads for damaged insulation or exposed metal before use. Replace if damaged.
- Do not operate the meter if it appears damaged or if it is not operating properly.

### 3. PRODUCT OVERVIEW

Familiarize yourself with the front panel controls and display of the B&K Precision 5491B multimeter.

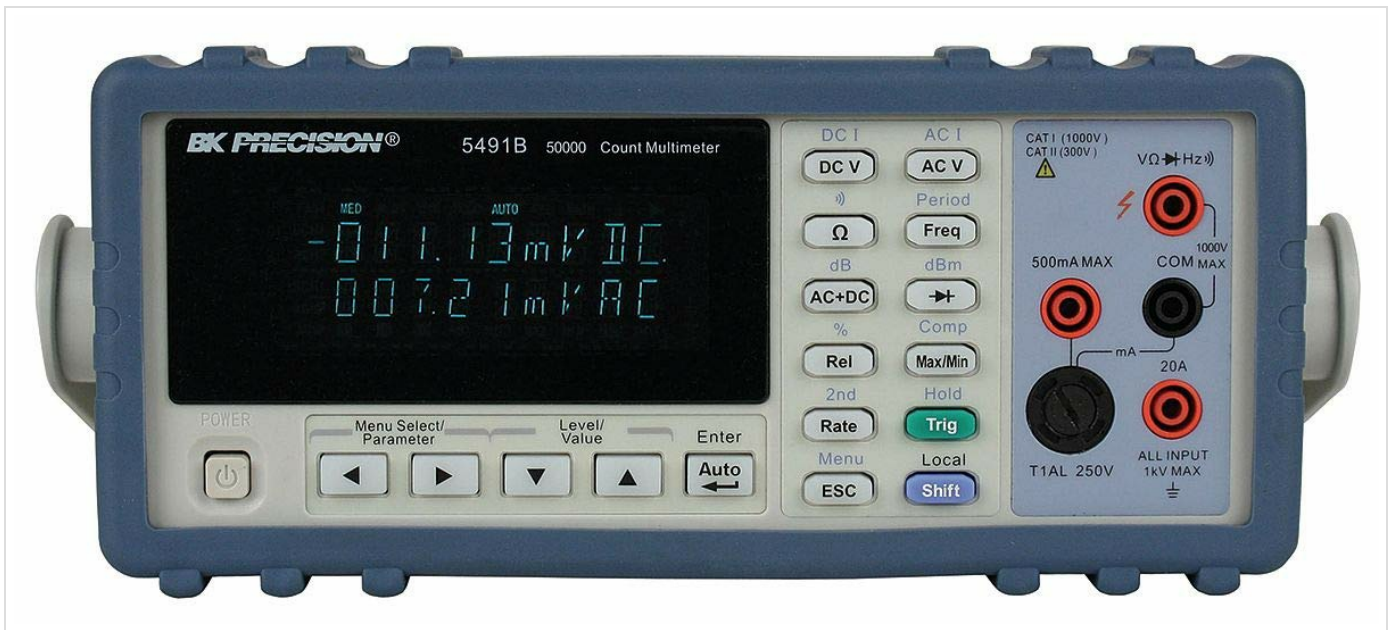


Figure 3.1: Front Panel Layout of the B&K Precision 5491B Multimeter.

The image displays the front of the B&K Precision 5491B multimeter. Key components visible include the large digital display showing measurement readings (e.g., -011.13mV DC, 007.21mV AC), a power button on the bottom left, navigation and selection buttons (Menu Select/Parameter, Level/Value, Enter/Auto, ESC, Shift), and function buttons for various measurements (DC I, AC I, DC V, AC V, Ohm, Freq, dB, dBm, AC+DC, %, Comp, Rel, Max/Min, 2nd, Hold, Rate, Trig, Menu, Local). On the right side are the input terminals: VΩHz for voltage, resistance, and frequency measurements, 500mA MAX for low current, COM for common ground, 20A for high current, and ALL INPUT 1kV MAX for general input.

#### 3.1 Front Panel Controls and Indicators

- **Display:** Dual LCD for simultaneous display of two measurements.
- **POWER Button:** Turns the multimeter on or off.
- **Function Buttons (DC V, AC V, Ω, Freq, etc.):** Select the desired measurement mode.
- **Navigation Buttons (Menu Select/Parameter, Level/Value):** Used to navigate menus and adjust settings.
- **Enter/Auto Button:** Confirms selections or toggles auto-ranging.
- **ESC Button:** Exits menus or cancels operations.
- **Shift Button:** Accesses secondary functions marked above primary buttons.
- **Input Terminals:**
  - **VΩHz:** Input for voltage, resistance, and frequency measurements.

- **500mA MAX:** Input for current measurements up to 500mA.
- **COM:** Common return terminal for all measurements.
- **20A:** Input for high current measurements up to 20A.
- **ALL INPUT 1kV MAX:** General input terminal, maximum 1000V.

## 4. SETUP

---

### 4.1 Power Connection

1. Ensure the multimeter is placed on a stable, level surface.
2. Connect the provided 110/220V power cord to the AC input on the rear panel of the multimeter.
3. Plug the other end of the power cord into a suitable AC power outlet.
4. Press the **POWER** button on the front panel to turn on the unit. The display will illuminate.

### 4.2 Connecting Test Leads

Always connect the black test lead to the **COM** terminal. The red test lead connection depends on the measurement type:

- For Voltage, Resistance, Frequency, and Diode tests: Connect the red test lead to the **VΩHz** terminal.
- For Current measurements up to 500mA: Connect the red test lead to the **500mA MAX** terminal.
- For Current measurements up to 20A: Connect the red test lead to the **20A** terminal.

**Note:** Ensure test leads are fully inserted into the terminals before taking measurements.

## 5. OPERATING INSTRUCTIONS

---

### 5.1 Basic Measurements

The 5491B defaults to auto-ranging mode upon power-on, automatically selecting the correct measurement range. You can switch to manual-ranging mode if desired.

#### 1. Voltage Measurement (DC V / AC V):

- Connect test leads to **VΩHz** (red) and **COM** (black).
- Press the **DC V** or **AC V** button.
- Connect the test leads in parallel to the circuit or component to be measured.

#### 2. Current Measurement (DC I / AC I):

- Connect test leads to **500mA MAX** or **20A** (red) and **COM** (black) depending on expected current.
- Press the **DC I** or **AC I** button.
- Connect the test leads in series with the circuit.

#### 3. Resistance Measurement ( $\Omega$ ):

- Ensure power is off and capacitors are discharged in the circuit.
- Connect test leads to **VΩHz** (red) and **COM** (black).
- Press the  **$\Omega$**  button.
- Connect the test leads across the component to be measured.

#### 4. Frequency (Freq) and Period (Period) Measurement:

- Connect test leads to **VΩHz** (red) and **COM** (black).
- Press the **Freq** or **Period** button.
- Connect the test leads to the signal source.

### 5. Continuity Test:

- Connect test leads to **VΩHz** (red) and **COM** (black).
- Press the **Ω** button, then use the **Shift** button to select continuity (indicated by a speaker icon).
- An audible tone indicates continuity.

### 6. Diode Test:

- Connect test leads to **VΩHz** (red) and **COM** (black).
- Press the **Ω** button, then use the **Shift** button to select diode test (indicated by a diode symbol).
- Connect the red lead to the anode and black lead to the cathode of the diode. The display shows the forward voltage drop. Reverse the leads to check for open circuit.

## 5.2 Advanced Functions

- **Relative Mode (Rel):** Stores a reading as a zero point for subsequent measurements, displaying the difference.
- **Max/Min:** Records and displays the maximum and minimum readings during a measurement session.
- **Hold:** Freezes the current reading on the display.
- **dB/dBm:** Measures AC and DC voltage in decibels or decibels relative to one milliwatt.
- **Pass/Fail Testing (Comp):** Allows setting high and low limits for automated testing.
- **Measurement Rate (Rate):** Adjusts the reading speed (Slow, Medium, Fast). Faster rates may reduce precision.

## 5.3 Computer Interface

The 5491B features USB and RS-232 interfaces for connecting to a computer. This allows for data logging, remote control, and integration with software applications. Cables are not included. The meter is compatible with the SCPI programming language for automated control.

## 6. SPECIFICATIONS

Parameter	Specification
Maximum Alternating Current (AC) Input	20 amp
Maximum Direct Current (DC) Input	20 amp
Maximum AC Voltage Input	750V
Maximum DC Voltage Input	1000V
Maximum Resistance Detected	50 megaohms
Frequency Range	10Hz to 1MHz
Display Resolution	50,000 counts (4-3/4 digits)
Power Supply	110/220V AC (power cord included)
Safety Ratings	IEC 61010:2001, EN61326-1:2006, EN61326-2-1:2006; CAT I 1000V, CAT II 300V
Weight	5.51 lb (2.5 kg)
Dimensions (H x W x D)	3.93 x 8.85 x 13.97 inches (100 x 225 x 355 mm)

## 7. MAINTENANCE

---

### 7.1 General Care

- Keep the multimeter clean and dry. Use a soft, damp cloth for cleaning. Do not use abrasives or solvents.
- Store the meter in a clean, dry environment when not in use.
- Avoid exposing the meter to extreme temperatures, humidity, or direct sunlight.

### 7.2 Fuse Replacement

If the current measurement function stops working, the fuse may need replacement. Refer to the rear panel markings for fuse specifications. Always replace with a fuse of the same type and rating to maintain safety and performance.

1. Disconnect the power cord and all test leads from the multimeter.
2. Locate the fuse compartment on the rear panel (refer to the full product manual for exact location).
3. Carefully open the fuse compartment.
4. Remove the blown fuse and replace it with a new fuse of the correct rating (e.g., T1AL 250V for the 500mA range, or higher for the 20A range as specified on the unit).
5. Close the fuse compartment securely.

**Warning:** Never use a fuse with a different rating or bypass the fuse. This can lead to serious injury or damage to the meter.

## 8. TROUBLESHOOTING

---

This section provides solutions to common issues you might encounter with your B&K Precision 5491B multimeter.

Problem	Possible Cause	Solution
Meter does not power on.	No power from outlet; power cord not connected; internal fuse blown.	Check power outlet and cord connection. If still no power, consult the Maintenance section for fuse replacement.
No reading or "OL" (Overload) displayed.	Incorrect range selected (in manual mode); open circuit; measurement exceeds meter's range.	Ensure correct function and range. Check for open circuits. If in manual mode, switch to auto-ranging or a higher range.
Inaccurate readings.	Poor test lead connection; external interference; meter needs calibration.	Ensure test leads are securely connected. Move away from strong electromagnetic fields. If issues persist, professional calibration may be required.
Current measurement not working.	Blown current fuse.	Refer to the Maintenance section for fuse replacement.
Display shows error code.	Internal fault, possibly firmware related.	Power cycle the device. If the error persists, contact B&K Precision customer support for assistance.

## 9. WARRANTY AND SUPPORT

---

For detailed warranty information, technical support, or service inquiries, please refer to the official documentation included with your product or visit the B&K Precision website. Warranty terms and conditions may vary by region and purchase date.

B&K Precision is headquartered in Yorba Linda, CA, and manufactures test and measurement instruments. The company meets ISO 9001:2008 standards and complies with RoHS and WEEE directives.

For the most up-to-date contact information and support resources, please visit: [www.bkprecision.com](http://www.bkprecision.com)