BK PRECISION

Instruction Manual

Model 2408
Mini-Pro® Digital Multimeter

Limited one-Year Warranty

B&K Precision Corp. warrants to the original purchaser that its product and the component parts thereof, will be free from defects in workmanship and materials for a period of one year from the data of purchase.

B&K Precision Corp. will, without charge, repair or replace, at its' option, defective product or component parts. Returned product must be accompanied by proof of the purchase date in the form a sales receipt.

To obtain warranty coverage in the U.S.A., this product must be registered by completing and mailing the enclosed warranty card to B&K Precision Corp., 1031 Segovia Circle, Placentia, CA 92870 within fifteen (15) days from proof of purchase.

Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alternations or repairs. It is void if the serial number is alternated, defaced or removed.

B&K Precision Corp. shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may have other rights, which vary from state-to-state.

SAFETY INFORMATION

The following safety information must be observed to insure maximum personal safety during the operation of this meter:

Always inspect your meter, test leads and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (eg-broken test leads, cracked cases, display not reading, etc.), do not attempt to take any measurements. Do not expose the instrument to direct sun light, extreme temperature or moisture.

Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material.

To avoid electric shock use CAUTION when working with voltages above 40Vdc or 20Vac. Never exceed the maximum allowable input value of any function when taking a measurement. Refer to the specifications for maximum inputs. Never touch exposed wiring, connections or any live circuit when attempting to take measurements.

When Using the probes, keep your fingers behind the finger guards on the probes.

Measuring voltage which exceeds the limits of the multimeter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated on the front of the meter.

SPECIFICATIONS

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 1999.

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: (OL) or (-OL) is displayed.

Zero: Automatic.

Low battery indication: The "🔋" is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 times per second.

Operating environment: 0°C to 50°C at < 70% relative humidity.

Storage temperature: -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.

Temperature coefficient: 0.1 × (specified accuracy) / per °C (0°C to 18°C, 28°C to 50°C).

Altitude: 6561.7 Feet (2000M).

Power: Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22.

Battery life: 200 hours typical with carbon-zinc.

Dimensions (H)×(W)×(D): 143mm× 68mm× 47mm(5.63×2.68×1.85 inches).

Weight: Approx. 206g(7.27oz) including battery.

Accessories: One pair test leads, 9V battery (installed) and Operating Instructions.

DC VOLTS

Ranges: 200mV, 2V, 20V, 600V
Resolution: 100µV
Accuracy: ±(1.2% rdg + 1 dgt)
Input impedance: 10MΩ
Overload protection: 600VDC or AC rms 500VDC/350V rms 15 second on 200mV range

AC VOLTS (50Hz - 500Hz)

Ranges: 200mV, 2V, 200V, 600V
Resolution: 100µV
Accuracy: ±(2.0% rdg + 4 dgts)
Input impedance: 10MΩ
Overload protection: 600VDC or AC rms 500VDC/350V rms 15 second on 200mV range

DC CURRENT

Ranges: 200µA, 20mA, 200mA, 10A
Resolution: 0.1µA
Accuracy:
±(1.5% rdg + 1 dgt) on 200µA to 200mA ranges
±(3.0% rdg + 3 dgts) on 10A range
Input protection:
0.5A/250V fast blow ceramic fuse
10A/600V fast bolw ceramic fuse

AC CURRENT (50Hz - 500Hz)

Ranges: 200µA, 20mA, 200mA, 10A
Accuracy:
±(2.0% rdg + 4 dgts) on 200µA to 200mA ranges
±(3.5% rdg + 4 dgts) on 10A range
Input protection:
0.5A/250V fast blow ceramic fuse
10A/600V fast bolw ceramic fuse

RESISTANCE

Ranges: 200Ω, 20kΩ, 200kΩ, 20MΩ
Resolution: 100mΩ
Accuracy:
±(1.5% rdg + 4 dgts) on 200Ω to 2MΩ ranges
±(3.0% rdg + 4 dgts) on 20MΩ range
Open circuit volts:
0.3Vdc typical, (3.0Vdc on 200Ω range)
Overload protection: 500VDC or AC rms

CONTINUITY

Audible indication: Less than 100Ω
Response time: 500ms
Overload protection: 500VDC or AC rms

DIODE TEST

Test current: 1.0mA(appreximate)
Accuracy: ±(2.0% rdg + 1 dgt)
Open circuit volts: 3.0Vdc typical
Overload protection: 500VDC or AC rms

NON-CONTACT VOLTAGE INDICATOR

Detect voltages from 70V to 480VAC 50Hz ~ 60Hz

OPERATION

Before taking any measurements, read the Safety Information Section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements.

Voltage Measurements

1. Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the desired Voltage type (AC or DC) and range. If magnitude of voltage is not known, set switch to the highest range and reduce until a satisfactory reading is obtained.
3. Connect the test leads to the device or circuit being measured.
4. For dc, a (-) sign is displayed for negative polarity positive polarity is implied.

Current Measurements

1. Set the Function/Range switch to the desired current.
2. For current measurements less than 200mA, connec the red test lead to the µA/mA jack and the black tes lead to the COM jack.
3. For current measurements of greater 200mA, connec the red test lead to the 10A jack and the black test lead to the COM jack.
4. Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter in series with the circuit.
5. Apply power and read the value of the display.

Resistance Measurements

1. Turn off any power to the resistor to be measured. Discharge all capacitors. Any voltage present during a resistance measurement will cause inaccurate readings and could damage the meter if exceeding the overload protection of 500VDC or AC.
2. Insert the BLACK and RED test leads into the COM and Ω input terminals respectively.
3. Select the desired ohms (Ω) range.
4. Connect the BLACK and RED test probe tips to the circuit or device under test, making sure it is de-energised first.
5. Open circuits will be displayed as an overload condition.
6. Test lead resistance can interfere when measuring low resistance readings and should be subtracted from resistance measurements for accuracy. Select lowest resistance range and make the test leads short together. The display value is the test lead resistance to be subtracted.

Diode Tests

1. Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the "⊣⊢" position.
3. Turn off power to the circuit under test.
4. Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
5. Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, ".000" or another number is displayed.
6. If the diode is open, "OL" is displayed in both directions.
7. If the junction is measured in a circuit and a low reading is obtained with both lead connections, the junction may be shunted by a resistance of less than 1kΩ. In this case the diode must be disconnected from the circuit for accurate tesing.

Continuity Measurements

1. Set the Funtion/Range switch to the ◄)/⊣⊢ position.
2. Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
3. Turn off power to the circuit under test. External Voltage across the components causes invalid reading.
4. Connect the test leads to the two points at which continuity is to be tested. The buzzer will sound if the resistance is less than approximately 100Ω.

Non-Contact Voltage Indicator

1. Remove the test leads from the meter. Push the "NC" button at any selected Function/Range. Then the display will be shut down and LED flashes with a short "chirp" sound for self-test.
2. Aim the sensor of the meter (Located at the top of the meter) to the object to be detected.
3. If a signal is detected, a continuous chirp sound is audible and the LED lights up at the same time.

MAX Maximum Recording Mode

This measurement function is used to measure the maximum value of a signal. It is usable with AC/DC voltage, AC/DC current, resistance, and capacitance measurements. To use this function, select the function and range and press the MAX button. When this is done, the "MAX" annunciator will appear in the display. Next, by inputting a signal, the MAX function operates. This maximum (MAX) value is held in digital memory for a long period. To exit the MAX mode,press the MAX button once again.

Hold Button

Press(HOLD) button to toggle in and out of the Data Hold mode. In the Data Hold mode, the "HOLD" annunciator is displayed and the last reading is frozen on the display. Press the (HOLD) button again to exit and resume readings.

MAINTENANCE

Maintenance consists of periodic cleaning and battery replacement. The exterior of the instrument can be cleaned with a dry clean colth to remove any oil, grease or grime. Never use liquid solvents or detergents.

Repairs or servicing not covered in this manual should only be performed by qualified personnel.

Battery Replacement

WARNING

TO AVOID ELECTRICAL SHOCK, DISCONNECT THE TEST LEADS AND ANY INPUT SIGNALS BEFORE REPLACING THE BATTERY. REPLACE ONLY WITH SAME TYPE OF BATTERY. (9-Volt)

This meter is powered by a NEDA type 1604 or equivalent 9-volt battery. When the meter displays the "🔋" the battery must be replaced to maintain proper operation. To replace the battery, remove the three screws from the back of the meter and open the bottom case, remove the battery from battery room.

Fuse Replacement

If no current measurements are possible, check for a blown overload protection fuse. There are two fuses; F1 for the μA/mA jack and F2 for the 10A jack. For access to fuses, remove the three screws from the back of the meter and open the bottom case. Replace F1 only with the original type 0.5A/250V, fast acting fuse. Replace F2 only with the original type 10A/600V, fast acting ceramic fuse.

NOTE

The instrument complies with classII, overvoltage CAT. III of the IEC1010-1(EN61010-1) standard. Pollution degree 2 in accordance with IEC-664 indoor use. If the equipment is used in a manner not specified, the protection provided by the equipment may be impaired.

⚠ ▣ When servicing, use only specified replacement parts or equivalent.

The symbols used on this instrument are:

⚠ Caution, risk of electric shock
⚠ Caution, refer to accompanying documents
▣ Equipment protected throughout by Double insulation (Class II)
~ Alternating current
⎓ Direct current
⏚ Ground

CE

This product complies with the requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking).

However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electromagnetic interference.

NOTE

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Service Information

Warranty Service: Please return the product in the original packaging with proof of purchase to the below address. Clearly state in writing the performance problem and return any leads, connectors and accessories that you are using with the device.

Non-Warranty Service: Return the product in the original packaging to the below address. Clearly state in writing the performance problem and return any leads, connectors and accessories that you are using with the device. Customers not on open account must include payment in the form of a money order or credit card. For the most current repair charges contact the factory before shipping the product.

Return all merchandise to B&K Precision Corp. with pre-paid shipping. The flat-rate repair charge includes return shipping to locations in North America. For overnight shipments and non-North America shipping fees contact:

B&K Precision Corp.
1031 Segovia Circle / Placentia, CA 92870
Phone: 714- 237-9220 / Fax: 714-237-9214
Website: www.bkprecision.com

Include with the instrument your complete return shipping address, contact name, phone number and description of problem.

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