**User’s manual for VC99+ 3 6/7 DMM**

1. SUMMARY

This AIDETEK VC99+ multimeter is a steady performance, battery-driven 3 6/7 digital multimeter. It uses the LCD with 23mm-high figure to make the reading clear and make operation more convenient.

The digital multimeter has the function of measuring DCV, ACV, DCA, ACA, resistance, capacitance, frequency, temperature, duty cycle, transistor and diode, continuity performance test. The meter can provide functions including analog bar and unit symbol display, data holding, relative value measuring, maximal/minimal value measuring, auto/manual range switching (RANGE), auto power off and warning functions. It adopts double integral A/D converter as its core. It is an ideal tool for labs, factories and radio-technology.

2. SAFETY NOTES

The instrument is designed according to IEC1010 standard (safety standard issued by International Electro technical Committee). Please read the following before operation.

1-1. Check the connection and insulation of test leads to avoid electric shock.
1-2. Do not input a limited voltage higher than DC 1000V or AC 750V when measuring ranges.
1-3. When measuring voltage higher than DC 60V, AC 40V, please be careful.
1-4. Select correct function and range to avoid fault operation.

3. SPECIFICATION

### 1. General features

1-1. Displaying: LCD;
1-2. Max display: 6000(3 6/7) digits automatic polarity, unit symbol and 61 section analog display;
1-4. Sampling rate: approx. 3 times/sec.
1-5. Over-range display: “OL” displayed in the highest digit.
1-6. Low battery display: "Battery low".
1-7. Working environment: (0 ~ 40)°C, relative humidity<80%;
1-8. Store environment: (-10 ~ 40)°C, relative humidity<80%;
1-9. Power supply: 2pcs 1.5V battery (“AAA”# battery);
1-10. Dimension: 185x93x35mm (length*width*height);
1-11. Weight: approx. 290g (including battery);

### 2. TECHNICAL FEATURES

#### 2-1. Accuracy: ± (a% × reading data + digits), environment temperature at (23±5)°C, relative humidity<75%, One year guarantee since production date.

#### 2-2. DC Voltage (DCV)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>600mV</td>
<td>±(0.5%+3)</td>
<td>0.1mV</td>
</tr>
<tr>
<td>6V</td>
<td>±(0.8%+3)</td>
<td>1mV</td>
</tr>
<tr>
<td>60V</td>
<td>±(0.8%+3)</td>
<td>10mV</td>
</tr>
<tr>
<td>600V</td>
<td>±(0.8%+3)</td>
<td>100mV</td>
</tr>
<tr>
<td>1000V</td>
<td>±(0.8%+3)</td>
<td>1V</td>
</tr>
</tbody>
</table>

Input impedance: approx. 10MΩ

Overload protection: 1000V DC or 750V AC.

#### 2-3. AC Voltage (ACV)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>6V</td>
<td>±(0.8%+5)</td>
<td>1mV</td>
</tr>
<tr>
<td>60V</td>
<td>±(1.0%+5)</td>
<td>10mV</td>
</tr>
<tr>
<td>600V</td>
<td>±(1.0%+5)</td>
<td>100mV</td>
</tr>
<tr>
<td>750V</td>
<td>±(1.0%+5)</td>
<td>1V</td>
</tr>
</tbody>
</table>

Input impedance: approx. 10MΩ

Overload protection: 1000V DC or 750V AC.

Frequency response: (40 ~ 200) Hz under 750V, other range: (40 ~ 400) Hz.

Sine wave RMS(Average value response).

#### 2-4. DC Current (DCA)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>600uA</td>
<td>±(1.0%+3)</td>
<td>0.1µA</td>
</tr>
<tr>
<td>6000uA</td>
<td>±(1.0%+3)</td>
<td>1µA</td>
</tr>
<tr>
<td>60mA</td>
<td>±(2.0%+3)</td>
<td>10µA</td>
</tr>
<tr>
<td>600mA</td>
<td>±(2.0%+3)</td>
<td>100µA</td>
</tr>
<tr>
<td>6A</td>
<td>±(2.0%+10)</td>
<td>1mA</td>
</tr>
</tbody>
</table>

MAX measurement voltage drop: full range mA: 300mV, A: 100mV.

Max input current: 20A (within 15 seconds)

Over load protection: 500mA/ 250V and 13A/250V fast molten fuse.

#### 2-5. AC Current (ACA)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>600uA</td>
<td>±(1.2%+5)</td>
<td>0.1µA</td>
</tr>
<tr>
<td>6000uA</td>
<td>±(1.2%+5)</td>
<td>1µA</td>
</tr>
<tr>
<td>40mA</td>
<td>±(2.0%+5)</td>
<td>10µA</td>
</tr>
<tr>
<td>600mA</td>
<td>±(2.0%+5)</td>
<td>100µA</td>
</tr>
<tr>
<td>6A</td>
<td>±(2.0%+10)</td>
<td>1mA</td>
</tr>
</tbody>
</table>
20A 10mA

MAX measurement voltage drop: full range mA :400mV,
A:200mV ,
Max input current: 20A (within 15 seconds)
Over load protection: 500mA/ 250V and 13A/250V
fast molten fuse.
Frequency response ; 20A range:40 ~ 100Hz,other
range:40~400Hz.

2-6. Resistance (Ω)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>600Ω</td>
<td>±(0.8%+5)</td>
<td>0.1Ω</td>
</tr>
<tr>
<td>6kΩ</td>
<td>±(0.8%+3)</td>
<td>1Ω</td>
</tr>
<tr>
<td>60kΩ</td>
<td>±(0.8%+3)</td>
<td>10Ω</td>
</tr>
<tr>
<td>600kΩ</td>
<td>±(1.2%+5)</td>
<td>100Ω</td>
</tr>
<tr>
<td>6MΩ</td>
<td>±(1.2%+5)</td>
<td>1kΩ</td>
</tr>
<tr>
<td>60MΩ</td>
<td>±(1.2%+5)</td>
<td>10kΩ</td>
</tr>
</tbody>
</table>

Open circuit voltage: 600mV
Over load protection: 250V DC or AC peak value;
NOTE: At range 600 Ω, short-circuit the test leads to
measure the wire resistance and then subtracts it from the real
measurement. Or press “”REL” to clear the wire resistance
and read the value directly.

2-7. CAPACITANCE (C)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>TESTING CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>40nF</td>
<td>±(3.5%+10)</td>
<td>10pF</td>
</tr>
<tr>
<td>400nF</td>
<td>±(2.5%+5)</td>
<td>100pF</td>
</tr>
<tr>
<td>4µF</td>
<td>±(5.0%+8)</td>
<td>1nF</td>
</tr>
<tr>
<td>40µF</td>
<td>±(5.0%+8)</td>
<td>10nF</td>
</tr>
<tr>
<td>400µF</td>
<td>±(5.0%+8)</td>
<td>100nF</td>
</tr>
<tr>
<td>2000µF</td>
<td>±(5.0%+8)</td>
<td>1uF</td>
</tr>
</tbody>
</table>

Overload protection :250V DC or AC peak value.

2-8. FREQUENCY (F)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>RESOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>10Hz</td>
<td>±(0.5%+4)</td>
<td>0.01Hz</td>
</tr>
<tr>
<td>100Hz</td>
<td>±(0.5%+4)</td>
<td>0.1Hz</td>
</tr>
<tr>
<td>1000Hz</td>
<td>±(0.5%+4)</td>
<td>1Hz</td>
</tr>
<tr>
<td>10kHz</td>
<td>±(0.5%+4)</td>
<td>10Hz</td>
</tr>
</tbody>
</table>

Input sensitivity:0.7V

Over load protection: 250V DC or AC peak value;
2-9.Transistor(hFE)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>TESTING CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPN OR PNP</td>
<td>0~1000</td>
<td>Basic current approx.15µA, Vce approx.4.5V</td>
</tr>
</tbody>
</table>

Over load protection: 250V DC or AC peak value;
2-10.Diode and continuity performance test

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>TESTING CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward voltage drop of diode</td>
<td>Forward DCA is approx. 0.5mA, the backward voltage is approx 1.5V</td>
<td></td>
</tr>
<tr>
<td>Buzzer makes a long sound while resistance is less than (50±10)Ω</td>
<td>Open circuit voltage is approx. 0.5V</td>
<td></td>
</tr>
</tbody>
</table>

Over load protection: 250V DC or AC peak value;
CAUTION: DO NOT INPUT VOLTAGE AT THIS RANGE!

2-10. TEMPERATURE (℃)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>RESOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40℃ -1000℃</td>
<td>&lt;</td>
<td>400℃</td>
</tr>
<tr>
<td>≥400℃</td>
<td>±(0.8%+15)</td>
<td></td>
</tr>
<tr>
<td>≥750℉</td>
<td>±(1.5%+15)</td>
<td></td>
</tr>
</tbody>
</table>

Sensor: TP01(K type thermocouple)
CAUTION: DO NOT INPUT VOLTAGE AT THIS RANGE!

4. OPERATION

4-1. Panel description
1. LCD: display the measuring value and unit.

4-2. DCV measuring
1. Select the knob to \( \text{V~} \) range.
2. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal.
3. Auto range is the original state, it will display “AUTO” symbol, press “RANGE” key to change to manual range mode. 600mV, 6V, 60V, 600V, 1000V range is selective;
4. Connect the leads crossly to the electric circuit under test; LCD displays polarity and voltage under test connected by the red test lead.

Note:
1. Firstly users should select the knob to the highest range, if users had no idea about the range of voltage under test, then select the proper range based on displaying value. If LCD displays “OL”, it means meter is over the max. Value of this range, thus should select the knob to a higher range.
2. Do not input a voltage over AC 750V.
3. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.
4. When the measuring voltage large than AC750V, the built-in buzzer will be sounds.

4-4. DCA measuring
1. Insert the black test lead to “COM” terminal and the red one to “mA” terminal (the Max. 600mA) or to “20A”(the Max. 20A);
2. Select the knob to a proper DCA range, press “DC/AC” key to select the measurement mode, then connect the leads crossly to the electric circuit under test; LCD displays polarity and current under test connected by the red test lead.

Note:
1. Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value. If the LCD displays “OL”, it means the current is over range. Now you need to select the knob to a higher.
2. Max. input current is 600mA or 20A (subject to where the red test lead inserted to), too large current will damage the fuse.

4-5. ACA measuring
1. Insert the black test lead to “COM” terminal and the red one to “mA” terminal (the Max. 600mA) or to “20A”(the Max. 20A);
2. Select the knob to a proper ACA range, press “DC/AC” key to select the measurement mode, and connect the leads crossly to the electric circuit under test. LCD displays current by the test lead.

Note:
1. Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value. If the LCD displays “OL”, it means meter is over the max. Value of this range, thus should select the knob to a higher range.
2. Do not input a voltage over AC 750V.
3. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.
4. When the measuring voltage large than AC750V, the built-in buzzer will be sounds.

4-6. Resistance measurement
1. Select the knob to a proper resistance range, and connect the leads crossly with the resistor under tested.
2. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal.
3. Auto range is the original states, press “RANGE” key to change to manual range mode.
4. When measuring the min. resistance, please short-circuit the test leads at first, press “REL”, then test the resistance, it will display the actual resistance.

Note:
1. Firstly users should select the knob to the highest range, if users had no idea about the range of resistance under test, and then select the proper range based on displaying value. If the LCD displays “OL”, when the resistance is over the selected range. The knob should be adjusted to a higher range.
2. The LCD displays “OL” when the resistance is over the selected range. The knob should be adjusted to a higher range. When measuring value is over 1MΩ, the reading will take a few seconds to be stable. It’s normal for high resistance measuring.
2. When input terminal is in open circuit, overload displays “OL”.
3. When measuring in line resistor, be sure that the power is off and all capacitors are released completely.
4. Do not input any voltage at resistance range even the meter has voltage protection functions at this range!

4-7. Capacitance measurement
1. Select knob to “ range;
2. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal;
3. If the LCD doesn’t display “0”, press “REL” to clear the reading;
4. Select the knob to proper capacitance range, and insert the measuring accessories or test leads into “COM” and “V/Ω/Hz” terminal. (Note: the red test leads is for positive pole ○ ). LCD displays capacitance value.

Note:
1. Don’t input voltage or current to the “V/Ω/Hz” terminal when measuring the capacitance or the capacitance isn’t away from the “Cx” terminal.
2. To assure the accuracy, please press “REL” to clear the reading before testing.
3. There is only the auto range mode under the capacitance range.
4. The capacitance must be complete discharge before testing.
5. The reading of 400μF range delay 15 seconds

4-8. Frequency measurement
1. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal;
2. Select the knob to “Hz” range, insert the test leads or shielded cable to the signal source or the load which is tested.
3. Press “Hz/DUTY” key to switch frequency/duty cycle, it will display the frequency or duty cycle of the signal source which is tested.

Note:
1. There is only the auto range mode under the frequency range;
2. The meter can still work if the input is higher than 10Vrms, but the accuracy is not guaranteed;
3. In noise environment, you’d better use shield cable to measure a low signal;
4. When measuring high voltage circuit, any parts of your body should not touch the high voltage circuit;
5. Don’t input voltage higher than 250V DC or AC peak value, or it may damage the meter.

4-9. Transistor hFE measuring
1. Select the knob to hFE range;
2. Define the transistor is NPN or PNP type, insert the emitter, base and collector separately to the correct hole, the approximate value will be displayed on LCD.

4-10. Diode and Continuity performance test:
1. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal (the polarity of red lead is “+”) ;
2. Select the knob to “DC/AC” range, press “DC/AC” key to select the measurement mode, connect test leads with the diode under tested,
3. Forward measuring: insert the red test lead to diode positive polarity, the black test lead to diode cathode polarity, the reading is the approx. value of diode forward voltage drop.
4. Backward measuring: the red test lead connects to diode cathode polarity, the black test lead to diode positive polarity, the LCD display “OL”;
5. The complete diode testing include forward and backward measurement, if the result isn’t meet the above, it means the diode is bad.
6. Press “DC/AC” key to select the Continuity measurement mode.

4-11. Temperature measurement
1. Select the knob to “℃/ °F” range;
2. Insert the cold point of thermocouple to “K Temp” socket, put the working end (temperature measurement end) of thermocouple on the surface or inside the object to be tested. Then you can read temperature from the screen, and the data is in Centigrade. Press “DC/AC” key to select Fahrenheit, the data is in Fahrenheit.

Note:
1. If insert the thermocouple opposited, it will display the mistake value, when the temperature is rising, the value will be down.
2. When the input terminal open-circuit, it will display the normal temperature.
3. Don’t change the temperature probe optionally, or the value accuracy isn’t guarantee.
4. Don’t input voltage at temperature range.

4-12. Data holding
Press HOLD key, presently measured value is held on LCD.
and **HOLD** symbol displays. press it again the function is cancelled.

### 4-13. Auto power off
1. When the meter stops work about 15 minutes, the built-in buzzer will be sound 5 times and turn into sleeping mode, 1 minute later, the buzzer sound a long voice 1 time, the meter will be power off. Press any key to restart the power.
2. Press “DC/AC” key and then turn on, the auto power off function will be cancelled.

### 5. Meter maintenance
1. Don’t input the voltage value higher than DC 1000V or AC 750V
2. Don’t measuring the voltage at current, resistance, diode and continuity rage
3. Don’t use the meter when the battery isn’t install or the back case isn’t firm.
4. When replacing fuse, please take away the test leads from the measuring point and power off at first.
5. Keep the meter away from water, dust and shock.
6. Do not store and operate the meter under the condition of high temperature, high humidity, combustible, explosive and strong magnetic place.
7. Wipe the case with a damp cloth and detergent; do not use abrasives and alcohol.
8. If do not operate for a long time, should take out the battery to avoid leakage.
9. When **$\text{Battery}$** symbol displays, should replace the battery following the steps:
9-1. see picture 2, move holster at first.
9-2. Unlock the button and remove the battery case;
9-3. Take out the old battery and replace the new one. It’s better to use alkaline battery for longer life.
9-4. fit on battery case and bolt.
9-5. see the picture to fit on the holster.
10. fuse change: When replacing fuse, please change another same type and specification fuse.

### Note:

#### 6. Trouble shooting

If the meter does not work properly, check the meter as following:

<table>
<thead>
<tr>
<th>Fault</th>
<th>Solution</th>
</tr>
</thead>
</table>
| No reading on LCD           | ■ Turn on the power
|                              | ■ Replace battery                 |
| $\text{Error}$ signal appears | ■ Replace battery                 |
| No current or temperature input | ■ Replace fuse                  |
| Big error Value             | ■ Replace battery                 |
| ACV big error value         | ■ The voltage was measured frequency higher than 400Hz |

- The specifications are subject to change without notice.
- The content of this manual is regarded as correct, error or omits PLS. contact with factory.
- We hereby will not be responsible for the accident and damage caused by improper operation. The function stated for this User Manual cannot be the reason of special usage.