

**DVM340DI**

**3 3/4 AUTO RANGE & AUTO POWER OFF  
DIGITAL MULTIMETER  
OPERATING MANUAL**

**3 3/4 AUTO-BEREIK & AUTOMATISCHE UITSCHAKELING  
DIGITALE MULTIMETER  
BEDIENINGSHANDLEIDING**

**MULTIMETRE DIGITAL 3 3/4  
AVEC ECHELLE AUTOMATIQUE & EXTINCTION AUTOMATIQUE  
MANUEL D'UTILISATION**

**DIGITALES MULTIMETER, 3 3/4-STELLIGE ANZEIGE, AUTORANGE-  
FUNKTION & SELBSTAUSSCHALTEND  
BEDIENUNGSANLEITUNG**

**MULTÍMETRO DIGITAL  
3 3/4 AUTORANGO & AUTOAPAGADO  
MANUAL DEL USUARIO**



**velleman®**

This LCD Auto Range & Auto Power Off digital multimeter is a portable compact 3 3/4 digit multimeter. It is ideally suited for field, lab, shop, car and home applications.

## 1. SPECIFICATIONS

### 1.1. GENERAL SPECIFICATIONS

Display	3 3/4 digit LCD with a max. reading of 4000
Range control	automatic range control
Polarity	auto negative polarity indication
Zero adjustment	automatic
Overrange indication	"OL" display
Low battery	"  " is displayed when the battery voltage is below 2.4V
Auto power-off	30 minutes after there has been no switching or key input, the meter automatically enters power-off mode.
Safety standards	CD EMC/LVD. The meter is compliant with IEC1010 pollution degree 2, overvoltage category II
Operating environment	temperature: 0°C to +40°C (32°F to 104°F) humidity: < 85 % RH
Storage environment	temperature: -20°C to +60°C (-4°F to 140°F) humidity: < 95 % RH
Power	2 x 1.5V AA batteries
Dimensions	145 x 73 x 40mm
Weight	approx. 500g (including battery and holster)

### 1.2 ELECTRICAL SPECIFICATIONS

Accuracy  $\pm$  (% of reading + number in last digit)  
at  $23 \pm 5^\circ\text{C}$ , < 75 % RH

#### 1.2.1. DC VOLTAGE

Range	Accuracy
400mV, 4V, 40V, 400V	$\pm (0.5\% + 3)$
1000V	$\pm (0.8\% + 3)$

Impedance: 10M $\Omega$

### 1.2.2. AC VOLTAGE

Range	Accuracy
4V, 40V, 400V	$\pm (0.8\% + 3)$
400mV, 700V	$\pm (1.2\% + 3)$

Impedance: 10M $\Omega$

Frequency response: 40 - 400Hz

### 1.2.3. RESISTANCE

Range	Accuracy
400 $\Omega$ , 4k $\Omega$ , 40k $\Omega$ , 400k $\Omega$ , 4M $\Omega$	$\pm (1\% + 3)$
40M $\Omega$	$\pm (2\% + 3)$

Overload protection: 250V DC/AC rms

### 1.2.4. DC CURRENT

Range	Accuracy
40mA, 400mA	$\pm (1.5\% + 3)$
10A	$\pm (2\% + 5)$

Overload protection: Fast 0.5A/250V, 10A/250V fuse

### 1.2.5. AC CURRENT

Range	Accuracy
40mA, 400mA	$\pm (2\% + 5)$
10A	$\pm (2.5\% + 5)$

Overload protection: Fast 0.5A/250V, 10A/250V fuse

Frequency response: 40 - 400Hz

### 1.2.6. CAPACITANCE

Range	Accuracy
40nF	$\pm (3\% + 10)$
400nF, 4 $\mu$ F, 40 $\mu$ F	$\pm (2\% + 5)$
100 $\mu$ F	$\pm (3\% + 5)$

Overload protection: 250V DC/AC rms

### 1.2.7. FREQUENCY AND DUTY CYCLE

Range	Accuracy
10Hz - 10MHz	$\pm (0.02\% + 1)$

Duty cycle: 0.1% - 99.9% /  $\pm (0.02\% + 2)$

Sensitivity: sine wave 0.6V rms

Overload protection: 250V DC/AC rms

### 1.2.8. TEMPERATURE (Using K type thermocouple probe)

Range	Accuracy
0°C ~ +40°C	$\pm 3^\circ\text{C}$ (built-in temperature sensor)
-50°C ~ +200°C	$\pm 0.75\% \pm 3^\circ\text{C}$
+200°C ~ +750°C	$\pm 1.5\% \pm 3^\circ\text{C}$

Note: When connecting to the computer with RS232, a 'K'-type inside the software can be used for the non-linear calibration which will greatly improve the accuracy of the test, expand the test range to -250°C ~ +1300°C, and will control the non-linear error to within 1°C.

### 1.2.9. DIODE TEST

Test current:  $1 \pm 0.6\text{mA}$

Test voltage: approx. 1.5V

Overload protection: 250V DC/AC rms

### 1.2.10. CONTINUITY TEST

Audible indication: less than 60Ω approx.

Overload protection: 250V DC/AC rms

## 2. OPERATION

### WARNING

- 1) When measuring voltage, ensure that the instrument is not connected or switched to resistance range. Always ensure that the correct terminals are used for the type of measurement to be made.
- 2) Use extreme care when measuring voltage above 50V, especially with high energy sources.
- 3) Avoid making connections to "live" circuits whenever possible.
- 4) When measuring current ensure that the circuit is not "live" before opening it in order to connect the test leads.
- 5) Before making resistance measurements or diode tests, ensure the circuit under test is de-energized.
- 6) Always ensure that the correct function and range is selected. If in doubt about the correct range to use, start with the highest and work downwards.
- 7) Extreme care should be taken when using the meter in conjunction with a current transformer connected to the terminals, if an open circuit occurs.
- 8) Ensure that the test leads and probes are in good condition with no damage to the insulation.
- 9) Take care not to exceed the overload limits as given in the specifications.
- 10) Before opening the case of the meter to replace the batteries, disconnect the test leads from any external circuit, and set the selector switch to the "OFF" position.

### 2.1. Check the 3 volt battery

If the battery is low, a "" symbol will appear on the left of the display. It means that the battery should be replaced.

### 2.2. DC and AC voltage measurement

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "V $\Omega$ mA" socket.
- 2) Set the selector switch to the desired "V $\sim$ " position, and press the "SEL" key to select the function.
- 3) Connect the probes across the source or load under measurement.

### 2.3. DC and AC current measurement

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "V $\Omega$ mA" socket.
- 2) For measurements up to 400mA. Set the selector switch to the desired "mA $\overline{\sim}$ " position, and press the "SEL" key to select the function.
- 3) For current measurements from 400mA to 10A, connect the red test lead to the "10A" socket. Set the selector switch to the "A $\overline{\sim}$ " position, and press the "SEL" key to select the function.
- 4) Connect the probes across the source or load under measurement.

### 2.4. Resistance measurement and diode continuity test

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "V $\Omega$ mA" socket.
- 2) Set the selector switch to the " $\Omega$ / $\blacktriangleright$ +/.||)/CAP" position and press the "SEL" key to select the function.
- 3) Connect the probes across circuit to be tested.

Caution: Ensure that the circuit to be tested is "dead". Max. input overload: 250V rms and < 10 sec.

### 2.5. Capacitance measurement

- 1) Before testing, discharge the capacitor by shorting its leads together. Be careful when handling capacitors because they may have a charge on them of considerable power before discharging.
- 2) Connect the black test lead to the "COM" socket and the red test lead to the "V $\Omega$ mA" socket.
- 3) Set the selector switch to the " $\Omega$ / $\blacktriangleright$ +/.||)/CAP" position and press the "SEL" key to the "CAP" function.
- 4) Press the "REL" key, you can use the relative function to eliminate the zero error.
- 5) Connect the probes across the capacitor to be tested.

Note: When testing 100 $\mu$ F capacitors, note that there will be an approx. 15 sec. time lag.

## **2.6. Frequency and Duty cycle measurement**

- 1) Connect the black test lead to the "COM" socket and red test lead to the "V $\Omega$ mA" socket.
- 2) Set the selector switch to the "Hz" position and press the "RAN/Hz" key to select the function.
- 3) Connect the probes across the source or load under measurement.
- 4) When using the adapter, the correct reading should be obtained by multiplying the reading on the LCD display by 128. But if connected to a computer by RS232, and 'Adapter 128' box is selected in the 'Configure' column, the correct result will be obtained directly.

## **2.7. Temperature measurement**

- 1) Set the selector switch to the "°C"-range and connect the K-type thermocouple's black test lead to the "COM" socket and the red test lead to the "V $\Omega$ mA" socket.

## **2.8. Manual range and auto range**

- 1) "Auto" range is the default setting when the meter is first turned on. Press the "RAN/Hz" key to enter "Manual" mode. Each press of the "RAN/Hz" key increments the range.
- 2) The Hz/Duty and capacity functions cannot be manually changed.
- 3) Press the "RAN/Hz" key for more than 2 seconds to change back to "Auto".

## **2.9. Relative value display**

- 1) Press the "REL" key to get the relative measurement mode, the current value will then be stored in memory. The new value displayed is then equal to the measured value less the stored value.?? All functions have this capability except for the Hz/Duty function.?? Example: When measuring capacitance, you can use the Relative function to eliminate the zero error.

## **2.10. Auto Power Off and disable**

- 1) When the meter has been on 30 for minutes without any action from the user, the meter will automatically switch to "OFF" mode.
- 2) To disable the Auto Power Off function, press the "SEL" key while the meter is on.??

## **2.11. RS232**

- 1) Set up your PC under the Windows 95 or NT operating system. Insert the diskette in the drive. Click "Setup.exe". Follow the set-up messages on the screen.
- 2) Connect the RS232 cable between the serial ports of the meter and the computer. Slide the mouse to the "Program" menu box, then "DMM" appears. Click on "DMM" to start.

## **3. CARE AND MAINTENANCE**

### **3.1. Caring for your multimeter**

Your DVM340DI is an example of superior design and craftsmanship. The following suggestions will help you care for your multimeter, so that it gives you years of service.

- 1) Keep the multimeter dry. If it gets wet, wipe it dry immediately. Liquids can contain minerals that corrode electronic circuits.
- 2) Use and store the multimeter in normal temperature environments only. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.
- 3) Handle the multimeter gently and carefully. Dropping it can damage the circuit boards and case, and may cause the multimeter to operate incorrectly, although the holster can provide enough protection.
- 4) Keep the multimeter away from dust and dirt, which can cause premature wear of parts.
- 5) Wipe the millimetre with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the multimeter.
- 6) Only use new batteries of the required size and type. Always remove old or low batteries. They can leak chemicals that destroy electronic circuits.

## **3.2. Maintenance**

### **3 volt battery replacement or fuse replacement**

- a) Ensure the instrument is not connected to any external circuit. Set the selector switch to the OFF position and remove the test leads from the terminals.
- b) Remove the screw on the bottom of the case and lift up the case bottom. Remove the spent battery and replace it with a battery of the same type.
- c) Remove the screws on the bottom of the case and lift up the case. Replace the fuse with same type and rating: replace with 5 x 20mm 0.5A/250V fast-blow fuse or 6x25mm 10A/250V fast-blow fuse.