

Table of Contents

Title	Page
Overview	
Unpacking Inspection	
Safety Information	
Rules For Safe Operation	
Electrical Symbols	
Functional Structure	
Rotary Switch	
Functional Buttons	
Display Symbols	
Manual Ranging and Autoranging	
Measurement Operation	
A. DC Voltage Measurement	
B. AC Voltage Measurement	
C. Measuring Resistance	
D. Testing for Continuity	
E. Testing Diode	
F. Capacitance Measurement	
G. Frequency or Duty Cycle Measurement	
H. Temperature Measurement	
I. DC or AC Current Measurement	
Operation of Hold Mode	
The Use of Relative Value Mode	
POWER Button	

SELECT Button (blue)

General Specification

Accuracy Specification

- A. DC Voltage
- B. AC Voltage
- C. Resistance
- D. Continuity Test
- E. Diode Test
- F. Capacitance
- G. Frequency & Duty Cycle
- H. Temperature
- I. DC Current
- J. AC Current

Maintenance

- A. General Maintenance & Service
- B. Testing the Fuses
- C. Replacing the Battery
- D. Replacing the Fuses

RS232C Serial Port

- A. Connect with computer
- B. RS232C Port Cable
- C. Setting of RS232C Serial Ports
- D. System Requirements for Computer Interface Software

Overview

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the warnings and notes strictly.



Warning

Read the Rules for Safety Operation carefully before using the Meter

Digital Multimeter Model **VC820** and **VC840** (hereafter referred to as “the Meter”) has autorange and manual range options with maximum reading 3999. The enclosure structure design adopted advanced “co-injection” technique in order to provide sufficient insulation.

In addition to the conventional measuring functions, there is a RS232C standard serial port is equipped with this Meter for easy connection with computer to realize macro recording and monitoring and capture of transient dynamic data, displaying change of waveform during the measurement, providing data and evidence to engineering technicians for scientific research. This is also a highly applied digital multimeter of high performance with full input protection. VC840 also has true rms reading for AC voltage and AC current measurements.

Except where noted, the descriptions and instructions in this Operating Manual apply to both the VC820 and VC840.

Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully to see any missing or damaged part:

Item	Description	Qty
1	Operating Manual	1 piece
2	Test Lead	1 pair
3	RS232C (I) Interface cable	1 piece
4	Installation Guide & Software (CD-ROM)	1 piece
5	Test Clip	1 piece
6	Temperature Probe (VC840 ONLY)	1 piece

In the event you find any missing or damage, please contact your dealer immediately.

Safety Information

In this manual, a **Warning** identifies conditions and actions that pose hazards to the user, or may damage the Meter or the equipment under test.


This Meter complies with the standards GB4793.1 & IEC1010-1: In pollution degree 2, overvoltage category (CAT II 1000V, CAT III 600V) and double insulation.

CAT II: local classification of CAT II electronic equipment, portable units. Its transient overvoltage shall be less than that of CAT III.












CAT III: Distribution level, fixed installation, with smaller transient overvoltage than CAT IV

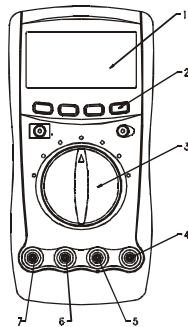
Rules For Safe Operation

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

1. Do not use this Meter in the event you find the test lead, LCD display, or insulation of the case is/are obviously broken, or you believe this Meter being malfunctioned.
2. If the test lead is/are damaged, replace new test lead with same model no. or identical electrical specifications.
3. When using the test leads, keep your fingers behind the finger guards.
4. Do not impose any effective voltage over 1000V on the terminal and earth of the Meter to prevent electric shock and damage to the Meter.
5. When the Meter working at an effective voltage over 60V in DC or 30V in AC, special care should be taken for there is danger of electric shock.
6. Do not operate the Meter with the case (or part of the case) removed; there is danger of electric shock.
7. When replacing fuse or battery, the test leads should be disconnected from the tested circuit and the **POWER** should be pressed off before opening the case.
8. Identical nominal fuse of quick response must be used for replacement of a broken fuse.
9. The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement is conducted to prevent damage of the Meter.
10. The internal circuit of the Meter shall not be altered at will to avoid damage of the Meter and any accident.
11. Replace the battery as soon as the battery indicator  appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
12. Soft cloth and neutral detergent should be used to clean the surface of the Meter when servicing. No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.
13. Do not use the Meter in an environment of high temperature, humidity, and storage of explosive or inflammable materials. Particularly not to put the Meter in a humid condition for storage. The performance of the Meter may deteriorate after dampened.
14. Use the proper terminals, function, and range for your measurements.

Electrical Symbols

	AC (Alternating Current)		Deficiency of Built-In Battery
	DC (Direct Current)		Continuity Test
	AC or DC		Diode
	Grounding		Fuse
	Double Insulated		Conforms to Standards of European Union
	Warning		





Functional Structure (see figure 1) ^{Fig1}

- LCD Display






- Functional Button
- Rotary Switch
- HzVΩ Input Terminal:
Insert the red test lead for testing voltage, frequency/duty cycle, resistance, diode, continuity and capacitance.
- COM Terminal:
Insert black test lead.
- μAmA Input Terminal: (VC820 ONLY)
Insert red test lead for testing current μA $\tilde{\sim}$ or mA $\tilde{\sim}$.
- μAmA⁰C Input Terminal: (VC840 ONLY)
Insert red test lead for testing current μA $\tilde{\sim}$ or mA $\tilde{\sim}$ or temperature.
- 20A Input Terminal:
Insert red test lead for testing current A $\tilde{\sim}$

Rotary Switch

Switch Position	Function
V $\tilde{\sim}$	AC or DC Voltage Measurement
 Ω (VC820 ONLY)	Continuity or Diode or Resistance Test
 Ω \dagger (VC840 ONLY)	Continuity or Diode or Resistance or Capacitance Test
\dagger (VC820 ONLY)	Capacitance Test
Hz	Frequency Measurement
°C (VC840 ONLY)	Temperature in Celsius
μA $\tilde{\sim}$	AC or DC Current Measurement from 0.1μA to 4000μA
mA $\tilde{\sim}$	AC or DC Current Measurement from 0.01mA to 400.0mA
A $\tilde{\sim}$	AC or DC Current Measurement from 0.001A to 20.00A

Functional Buttons

Button	Function	Operation Performed	LCD Display
POWER (the red button)	Power Switch	Turn the power on and off.	
SELECT (the blue button)	Function Selector	Press SELECT to select function when there is more than one function at one rotary switch position; the Meter beeps.	
RANGE	Manual or Auto Range Selection	<ol style="list-style-type: none"> 1. Press RANGE to enter the manual ranging mode; the Meters beeps. Manually selecting a range causes the Meter to exit the Hold and REL modes. 2. Press RANGE to step through the ranges available for the selected function; the Meter beeps. 3. Press and hold RANGE for 2 seconds to return to autoranging; the Meter beeps. 	Auto
Hz %	Frequency or Duty Cycle Test	<ol style="list-style-type: none"> a. In frequency mode, press Hz % to toggle between frequency measurement (Hz) and duty cycle (%) mode; the Meter beeps. b. In voltage or current mode, press Hz % to toggle between voltage (V) or current (A) measurement and frequency measurement (Hz) and duty cycle (%) mode; the Meter beeps. 	Hz or %
			V or μA or mA or A or Hz or %

REL 	Relative Value Mode	Press REL  to enter and exit the REL mode in any mode; the Meter beeps.	
HOLD 	Data Holding	Press HOLD to enter and exit the Hold mode in any mode.	

Display Symbols (see figure 2)

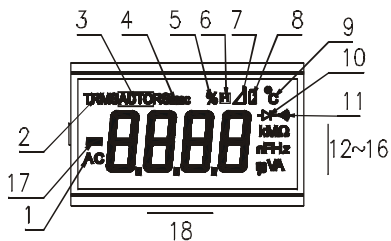









Fig2

Number	Symbol	Meaning
1	AC	Indicator for AC voltage or current. VC820: The displayed value is the mean value. VC840: The displayed value is the true rms value.
2	TRMS (VC840ONLY)	Indicator for true rms value.

3		The Meter is in the auto range mode in which the Meter automatically selects the range with the best resolution.
4	RS232C	Data output is in progress.
5	%	Indicator for duty cycle.
6		Data hold is active.
7		The relative value mode is on to display the stored value minus the present value.
8		The battery is low. ⚠ Warning: To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
9	^o C	Centigrade. The unit of temperature.
10		Test of diode
11		The continuity buzzer is on.
12~16	Ω,kΩ,MΩ	Ω: Ohm. The unit of resistance. kΩ: kilohm. 1×10^3 or 1000 ohms. MΩ: Megohm. 1×10^6 or 1,000,000 ohms.
	μF, nF	F: Farad. The unit of capacitance. μF: Microfarad. 1×10^{-6} or 0.000001 farads. nF: Nanofarad. 1×10^{-9} or 0.000000001 farads.
	Hz, kHz, MHz	Hz: Hertz. The unit of frequency. kHz: Kilohertz. 1×10^3 or 1000 hertz. MHz: Megahertz. 1×10^6 or 1,000,000 hertz.

	V, mV	V: mV	Volts. The unit of voltage. Millivolt. 1×10^{-3} or 0.001 volts.
	A, mA, μA	A: mA: μ A:	Amperes (amps). The unit of current. Milliamp. 1×10^{-3} or 0.001 amperes. Microamp. 1×10^{-6} or 0.000001 amperes.
17		Indicates negative reading.	
18	OL	The input value is too large for the selected range.	

Manual Ranging and Autoranging

The Meter has both manual range and autorange options:

- In the autorange (**Auto**) mode, the Meter selects the best range for input signals. This allows you to switch test points without having to reset the range.
- In the manual range mode, you may select the range. This allows you to override autorange and lock the Meter in a specific range.

The Meter defaults to the autorange mode in measurement functions that have more than one range. When the Meter is in the autorange mode, **Auto** is displayed.

To enter and exit the manual range mode:

1. Press **RANGE**.

The Meter enters the manual range mode and **Auto** turns off

Each presses of **RANGE** increments the range. When the highest range is reached, The Meter wraps to the lowest range.

NOTE

If you manually change the measurement range after entering the REL or Hold recording modes, the Meter exits these modes..

2. To exit the manual range model, press and hold **RANGE** for two seconds.
The Meter returns to the autorange mode and **Auto** is displayed.

Measurement Operation

A. DC Voltage Measurement

 **Warning**

To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V / 750V TRMS although readings may be obtained.

The DC Voltage ranges are: 400.0mV, 4.000V, 40.00V, 400.0V and 1000V. To measure DC Voltage, connect the Meter as follows:

1. Insert the red test lead into the **H_zV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **V $\overline{\sim}$** (DC measurement is default)
3. Connect the test leads across with the object being measured.

The measured value shows on the display.

In each range, the Meter has an input impedance of $10M\Omega$. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to $10k\Omega$, the error is negligible (0.1% or less).

When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

B. AC Voltage Measurement

Warning

To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V / 750V TRMS although readings may be obtained.

The AC Voltage ranges are: 400.0mV, 4.000V, 40.00V, 400.0V and 750V. To measure AC Voltage, connect the Meter as follows:

1. Insert the red test lead into the **H_zV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **V \approx** and press **SELECT** (blue button) to select **AC** measurement.
3. Connect the test leads across with the object being measured.
The measured value shows on the display.

In each range, the Meter has an input impedance of $10M\Omega$. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to $10k\Omega$, the error is negligible (0.1% or less).

Effective value stability period:

When the reading obtained is less than “100”, the effective value converter needs a longer time to become stabilize. When there is no input voltage, the maximum reading displayed is “10”.




When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

C. Measuring Resistance


Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

The resistance ranges are: 400.0 Ω , 4.000k Ω , 40.00k Ω , 400.0k Ω , 4.000M Ω and 40.00M Ω . To measure resistance, connect the Meter as follows:

1. Insert the red test lead into the **H_zV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **Ω   ** and press **SELECT** (blue button) to select **Ω** measurement mode.
3. Connect the test leads across with the object being measured.

The measured value shows on the display.

The test leads can add 0.1 Ω to 0.2 Ω of error to resistance measurement. To obtain precision readings in low-resistance measurement, that is the range of 400.0 Ω , short-circuit the input terminals beforehand, using the relative measurement function button **REL**  to automatically subtract the value measured when the testing leads are short-circuited from the reading.

The LCD displays **OL** indicating open-circuit for the tested resistor or the resistor value is higher than the maximum range

of the Meter.

When the value of shorted test lead is higher than 0.5Ω , check the test lead connection, proper terminal, function and range are made properly.

For high-resistance measurement ($>1M\Omega$), it is normal that it will take several seconds to obtain a stable reading.



When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

D. Testing for Continuity

Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before testing for continuity.

To test for continuity, connect the Meter as below:

1. Insert the red test lead into the **H_ZV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to Ω  and press **SELECT** (blue button) to select  measurement mode.
3. The buzzer sounds if the resistance of a circuit under test is less than around 50Ω .

When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

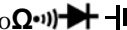

E. Testing Diode

Warning

To avoid possible damage to the Meter and to the device under test, disconnect circuit power and discharge all high-voltage capacitors before testing diodes.

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test a diode out of a circuit, connect the Meter as follows:

1. Insert the red test lead into the **H_zV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to  and press **SELECT** (blue button) to select  measurement mode.
3. Connect the test leads across with the object being measured.
The measured value shows on the display.

Connect the test leads to the proper terminals as said above to avoid error display. The LCD will display OL indicating open-circuit for wrong connection. The unit of diode is Volt (V), displaying the positive-connection voltage-drop value.

When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

F. Capacitance Measurement

Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC Voltage function to confirm that the capacitor is discharged.

The Meter's capacitance ranges are: 40.00nF, 400.0nF, 4.000 μ F, 40.00 μ F, and 100.0 μ F. To measure capacitance, connect the Meter as follows:

1. Insert the red test lead or the red test clip into the **H_zV Ω** terminal and the black test lead or black test clip into the **COM** terminal.
2. Set the rotary switch to **⎓**. (For VC820 switch to **⎓** and press **SELECT** to select **nF** measurement mode.)
3. Connect the test leads or the test clips across with the object being measured.
The measured value shows on the display.

The LCD displays OL indicating the tested capacitor is short or it exceeds the maximum range.

For testing the capacitor with polarity, connect the red clip to positive & black clip to negative.

When capacitance measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove the testing leads away from the input terminals of the Meter.

To minimize the effect of capacitance stored in the test leads, the test lead should be as short as possible. To measure a small quantity of capacitance, use REL mode to remove the leads capacitance. Remaining voltage, insulated impedance, & dielectric absorption from the capacitor may cause the measurement error.

G. Frequency or Duty cycle Measurement

The measurement range is from 5Hz to 10MHz. To measure frequency, connect the Meter as follows:

1. Insert the red test lead into the **HzV Ω** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **Hz**.
3. Connect the test leads across with the object being measured.
The measured value shows on the display.

In frequency mode, press **Hz %** to toggle between frequency measurement (Hz) and duty cycle (%) mode.

In voltage or current mode, press **Hz %** to toggle between voltage or current, frequency measurement (Hz) and duty cycle (%) mode.

Connect the Meter as above mentioned when carrying out duty cycle measurement. The duty cycle measurement range is: 0.1%~99.9%. The LCD displays OL indicating the inputted signal is high or low level.

When **Hz** or **%** measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

H. Temperature Measurement (VC840 ONLY)

The \square measurement range is -40 \square 1000 . To measure temperature, connect the Meter as follows:

1. Insert the red temperature probe into the **μ A mA** terminal and the black temperature probe into the **COM** terminal.
2. Set the rotary switch to \square .
3. Place the temperature probe to the object being measured.
The measured value shows on the display.

The Meter's LCD automatically displays the temperature value inside the Meter when there is no temperature probe connection.

The included point contact temperature probe (Part no. 41700103) can only be used up to 230°C or 446°F. For any measurement higher than that, the rod type temperature probe (Part no. 41700109) must be used instead.

I. DC or AC Current Measurement

Warning

Never attempt an in-circuit current measurement where the open-circuit voltage between the circuit and ground is greater than 600V.

If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. Use proper terminals, function, and range for the measurement. When the testing leads are connected to the current terminals, do not parallel them across any circuit.

The current measurement has 3 measurement positions on the rotary switch: μA , mA and A.

The μA has a 400.0 μA and 4000 μA range, with auto ranging; the mA has a 40.00mA and 400.0mA range, with auto ranging; A position has only a 4A and 20.00A range.

To measure current, do the following:

- 1 Turn off power to the circuit. Discharge all high-voltage capacitors.
- 2 VC820: Insert the red test lead into the μA or 20A terminal and the black test lead into the COM terminal.
VC840: Insert the red test lead into the μA or 20A terminal and the black test lead into the COM terminal.

Use the 20A terminal and $A\sim$ range if the current value to be tested is an unknown.

3. Set the rotary switch to $\mu A\sim$, $mA\sim$, or $A\sim$.
4. The Meter defaults to DC current measurement mode. To toggle between DC and AC current measurement function, press **SELECT** (blue button).
VC820: AC current is displayed as an mean value (calibrated against sine wave effective value).
VC840: AC current is displayed as true rms value.
5. Break the current path to be tested. Connect the red test lead to the more positive side of the break and the black test lead to the more negative side of the break.
6. Turn on power to the circuit.
The measured value shows on the display.

Effective value stability period:

When the reading obtained is less than “100”, the effective value converter needs a longer time to become stabilize. When there is no input voltage, the maximum reading displayed is “10”.

For safety sake, the measuring time for high current should be less than 10 seconds for each measurement and the interval time between 2 measurements should be greater than 15 minutes.




When current measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

Operation of Hold Mode

Warning

To avoid possibility of electric shock, do not use Hold mode to determine if circuits are without power. The Hold mode will not capture unstable or noisy readings.

The Hold mode is applicable to all measurement functions.

- Press **HOLD**  to enter Hold mode; the Meter beeps.
- Press **HOLD**  again or **RANGE** or **Hz %** or turn the rotary switch to exit Hold mode; the Meter beeps.
- In Hold mode,  is displayed.
- The Meter beeps when the selected range is overloaded or a positive result is obtained from continuity test, whether it is under the Hold mode or not.




The Use of Relative Value Mode


The REL mode applies to all measurement functions except frequency and duty cycle measurement. It subtracts a stored value from the present measurement value and displays the result.


For instance, if the stored value is 20.0V and the present measurement value is 22.0V, the reading would be 2.0V. If a new measurement value is equal to the stored value then display 0.0V.

When REL mode is selected, the Meter will switch from Autoranging to Manual ranging except under capacitance testing mode.

To enter or exit REL mode:

- Use rotary switch to select the measurement function before selecting **REL** . If measurement function changes manually after **REL**  is selected, the Meter exits the REL mode.
- Press **REL**  to enter REL mode, auto ranging turns off, and the present measurement range is locked and display “0” as the stored value.

- Press **REL**  again or turn the rotary switch to reset the stored value and exit REL mode.

Pressing **HOLD** in REL mode makes the Meter stop updating. Pressing **HOLD**  again to resume updating.




POWER Button



The **POWER** button is a self-lock switch use to turn on or off the power of the Meter.

SELECT Button (blue)

The **SELECT** button uses for selecting the required measurement function when there is more than one function at one position of the rotary switch.

General Specification

1. “HzVΩ” : Maximum voltage between terminal and ground is 1000Vrms.
2.  μ AmA Input Terminal : 0.5A, 600V fast type ceramic fuse. (VC820)
 μ AmA \square Input Terminal: 0.5A, 600V fast type ceramic fuse. (VC840)
3.  20A Input Terminal : 20A, 600V fast type ceramic fuse.
4. Maximum Display : 3999, updates 3/second.
5. Temperature : Operating: 0 \square to +40 \square (32 \square to +104 \square).
Storage: -10 \square to +50 \square (14 \square to +122 \square).
6. Relative Humidity : $\leq 75\%$ @ 0 \square - 30 \square ; $\leq 50\%$ @ 31 - 40 \square .
7. Altitude : Operating: 2000 m.
Storage: 10000 m.

- 8. Battery Type : One piece of 9V NEDA1604 or 6F22 or 006P.
- 9. Battery Deficiency : Display 
- 10. Dimensions (HxWxL) : 177 x 85 x 40 mm.
- 11. Weight : Approximate 300g (battery included).
- 12. Certificate : 

Accuracy Specification

Accuracy $\pm a\%$ reading + b digits guarantee for 1 year.

Operating temperature 23 ± 5 .

Relative humidity $< 75\%$.

A. DC Voltage

Range	Resolution	Accuracy	Input Protection	Remarks
400mV	0.1mV	$\pm(0.8\%+3)$	1000V DC 750V AC	Input impedance $\geq 10M\Omega$.
4V	1mV	$\pm(0.8\%+1)$		
40V	10mV			
400V	100mV			
1000V	1V	$\pm(1\%+3)$		

B. AC Voltage

Range	Resolution	Accuracy	Input Protection	Remarks
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VC820/VC840 OPERATING MANUAL

4V	1mV	$\pm(1\%+5)$	1000V DC 750V AC	Input impedance $\geq 10M\Omega$. VC820, displays effective value of sine wave (mean value response). VC840, displays true rms value. Frequency response 40□400Hz.
40V	10mV			
400V	100mV			
750V	1V	$\pm(1.2\%+5)$		

C. Resistance

Range	Resolution	Accuracy	Input Protection	Remarks
400 Ω	0.1 Ω	$\pm(1.2\%+2)$	1000V _p	Open circuit voltage approx. 0.45V
4k Ω	1 Ω	$\pm(1\%+2)$		
40k Ω	10 Ω			
400k Ω	100 Ω			
4M Ω	1k Ω	$\pm(1.2\%+2)$		
40M Ω	10k Ω	$\pm(1.5\%+2)$		

D Continuity Test

Range	Resolution	Accuracy	Input Protection	Remarks
400.0 Ω	0.1 Ω	Approx. $\leq 70\Omega$	1000V _p	Buzzer beeps continuously Open circuit voltage approx. 0.5V

E. Diode Test

Range	Resolution	Input Protection	Remarks
Diode	1mV	1000Vp	Open circuit voltage approximate 1.48V Displays approximate forward bias voltage drop: 0.5V~0.8V

F. Capacitance

Range	Resolution	Accuracy	Input Protection	Remarks
40nF	10pF	$\pm(3\%+10)$	1000Vp	Measure at REL mode
400nF	100pF	$\pm(3\%+5)$		
4 μ F	1nF			
40 μ F	10nF			
100 μ F	100nF	$\pm(4\%+5)$		

G. Frequency & Duty Cycle

Range	Resolution	Accuracy	Input Protection	Remarks
5Hz~10MHz	N/A	$\pm(0.1\%+3)$	1000Vp	Input sensitivity: $\leq 1\text{MHz}$: $\leq 300\text{m Vrms}$ □ $> 1\text{MHz}$: $\leq 600\text{m Vrms}$.
0.1%~99.9%	0.01%			Reading is only for reference purpose

H. Temperature (VC840 ONLY)

Range	Resolution	Accuracy		Input Protection
-40□□1000□	1□	-40□□0□	±(3%+4)	Fused 0.5A, 600V, fast type, φ5x25mm.
		0□□400□	±(1%+3)	
		400□□1000□	±(2%+10)	

1. DC Current

Range	Resolution	Accuracy		Input Protection	Remarks
		VC820	VC840		
400μA	0.1μA	±(1%+2)		Ceramic Fuse 0.5A, 600V	
4000μA	1μA				
40mA	0.01mA	±(1.2%+3)			
400mA	0.1mA				
4A	0.001A	±(1.5%+5)		Ceramic Fuse 20A, 600V	For continuous measurement≤10 seconds and interval not less than 15 minutes.
20A	0.01A				

J. AC Current

Range	Resolution	Accuracy		Input Protection	Remarks
		VC820	VC840		

VC820/VC840 OPERATING MANUAL

400 μ A	0.1 μ A	$\pm(1.5\%+5)$	Ceramic Fuse 0.5A, 600V	Frequency response 50 ~ 400Hz. VC820: displays effective value of sine wave (mean value response). VC840: displays true rms value.
4000 μ A	1 μ A			
40mA	0.01mA	$\pm(2\%+5)$		
400mA	0.1mA			
4A	0.001A	$\pm(2.5\%+5)$	Ceramic Fuse 20A, 600V	For continuous measurement \leq 10 seconds and interval not less than 15 minutes
20A	0.01A			

MAINTENANCE

This section provides basic maintenance information including battery and fuse replacement instruction.

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

A. General Service

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

- To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- Turn off the power of the Meter when it is not in use and take out the battery when not using for a long time.
- Do not store the Meter in a place of humidity, high temperature and strong magnetic field.

B. Testing the Fuses

Warning

To avoid electrical shock or personal injury, remove the test leads and any input signals before replacing the battery

or fuse.

To prevent damage or injury, install ONLY replacement fuses with identical amperage, voltage, and speed ratings.

To test the fuse:

1. Set the rotary switch to $\Omega \cdot \omega \rightarrow \text{H} \rightarrow \text{Hz}$ and press **SELECT** (blue button) to select $\omega \cdot \text{H}$.
2. Plug a test lead into the terminal **H_zV Ω** and connect the probe tip to the **20A** terminal.
3. If the Meter beeps, the fuse is good.
 - If the display shows **O.L** (overvoltage), replace the fuse.

If the Meter does not work while the fuse is all right, send it to your dealer for repair.

C. Replacing the Battery (see figure 3)

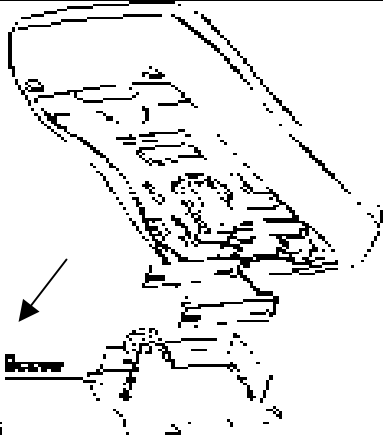



Fig3

⚠ Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator “” appears.

To replace the battery:

1. Press the **POWER** to turn the Meter off and remove all connections from the terminals.

2. Remove the screw from the battery compartment, and separate the battery compartment from the case bottom.
3. Remove the battery from the battery compartment.
4. Replace the battery with a new 9V battery (NEDA1604, 6F22 or 006P)
5. Rejoin the case bottom and battery compartment, and reinstall the screw.

D. Replacing the Fuses (see figure 4)

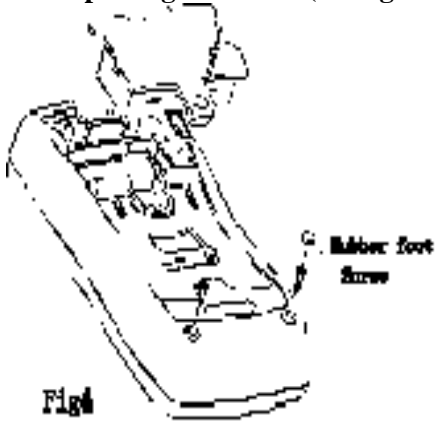


Fig 4

⚠ Warning

To avoid electrical shock or arc blast, or personal injury or damage to the Meter, use specified fuses **ONLY** in

accordance with the following procedure.

To replace the Meter's fuse:

1. Press the **POWER** to turn the Meter off and remove all connections from the terminals.
2. Remove the screw from the battery compartment, and separate the battery compartment from the case top.
3. Remove the 2 rubber feet and 2 screws from the case bottom, and separate the case top from the case bottom.
4. Remove the fuse by gently prying one end loose, then take out the fuse from its bracket.
5. Install **ONLY** replacement fuses with the identical type and specification as follows and make sure the fuse is fixed firmly in the bracket.
Fuse 1: Ceramic fuse 0.5A, 600V, fast type, \varnothing 5x20mm.
Fuse 2: Ceramic fuse 20A, 600V, fast type, \varnothing 6x25 mm.
6. Rejoin the battery compartment and the case top, and reinstall the screw.
7. Rejoin the case bottom and case top, and reinstall the 2 screws and 2 rubber feet.

Replacement of the fuses is seldom required. Burning of a fuse always results from improper operation.

RS232C Serial Port (see figure 5)

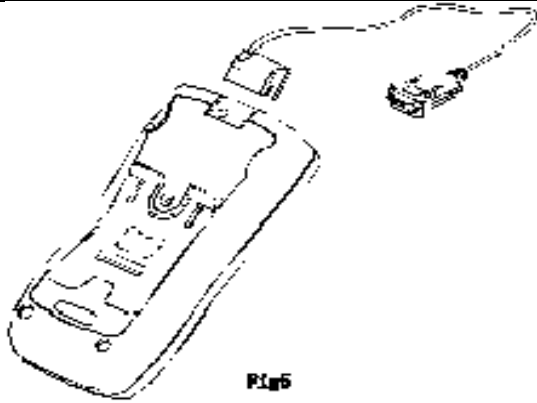


Fig5

A. Connect with computer

Connect the Meter with a computer using RS232C serial port as shown in figure5

B. RS232C Port Cable

The Meter		Computer		
D-sub 9 Pin Male		D-sub 9 Pin Female	D-sub 25 Pin Female	Pin Name
2	_____	2	3	RX
3	=====	3	2	TX
4	=====	4	20	DTR
5	=====	5	7	GND
6	=====	6	6	DSR
7	=====	7	4	RTS
8	=====	8	5	CTS

C. Setting of RS232C Serial Ports

Default of RS232C serial port for communication is set as:

- Baud Rate 2400
- Start bit 1 (always 0)
- Stop bit 1 (always 1)
- Data bits 7
- Parity Odd

D. System Requirements for Computer Interface Software

To use **vc820_840 Interface Program**, you need the following hardware and software:

- An IBM PC or equivalent computer with 80486 or higher processor and 640 x 480 pixel or better monitor.
- Microsoft Windows 95 or above.
- At least 8MB of RAM.
- At least 8MB free space in hard drive.
- Can access to a local or a network CD-ROM.
- A free serial port.
- A mouse or other pointing device supported by Windows.

Please refer to “ **VC820/VC840Computer Interface Software** ” for installation and operation instructions of the Interface Software.

****END****

* This operating manual is subject to change without notice.*

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- Microsoft Windows 95 or above.
- At least 8MB of RAM.
- At least 8MB free space in hard drive.
- Can access to a local or a network CD-ROM.
- A free serial port.
- A mouse or other pointing device supported by Windows.

B. Installing vc820_840 Interface Program


To install **vc820_840 Interface Program**, please follow below procedure:

Before install the interface program, make sure that the computer is running the Window 95 or above operating system.

1. -Insert the provided CD-ROM into CD-ROM drive.
-Double-click the My Computer icon from the Windows desktop.
-Locate the CD-ROM drive from the window, double-click the drive letter to display the folder of vc820_840.
-Double-click vc820_840 to display the contents of the folder.
-Double-click the file Setup.Exe.
2. Follow the on-screen installation instructions.
3. The installation program will create a **vc840_840 Interface Program** folder.
You will be prompted to select the kind of Program Folder you want to install; you should select “**vc820_840 Interface Program**”.

C. Getting Started with vc820_840 Interface Program

To run the **vc820_840 Interface Program**, please do the followings:

1. Insert the supplied RS232C (I) interface cable into the slot at the back of the meter and properly connect the other end of the cable to the serial port of computer.
“**NO COM**” will be displayed on the computer screen if it is not connected properly.
2. From the Windows **Start** menu, choose **Programs > vc820_840 Interface Program > vc820_840**
3. Press **COMSetup** to select corresponding COM 1/ 2 / 3 / 4.
4. Press **Connect** from menu bar to start the connection, the icon  will be displayed.

D. Graphical Operations (see figure 1)

During the connection, you can select the following functions by clicking the corresponding icon:

Fill: Click the box to select “fill-up graph” or unclick to select “line graph”.

Record: Setting the number of record to show on graph.

Clear: To clear all the graphics records permanently.

Save: To save a file in BMP format. The default file name is C:\DATA1.BMP”.

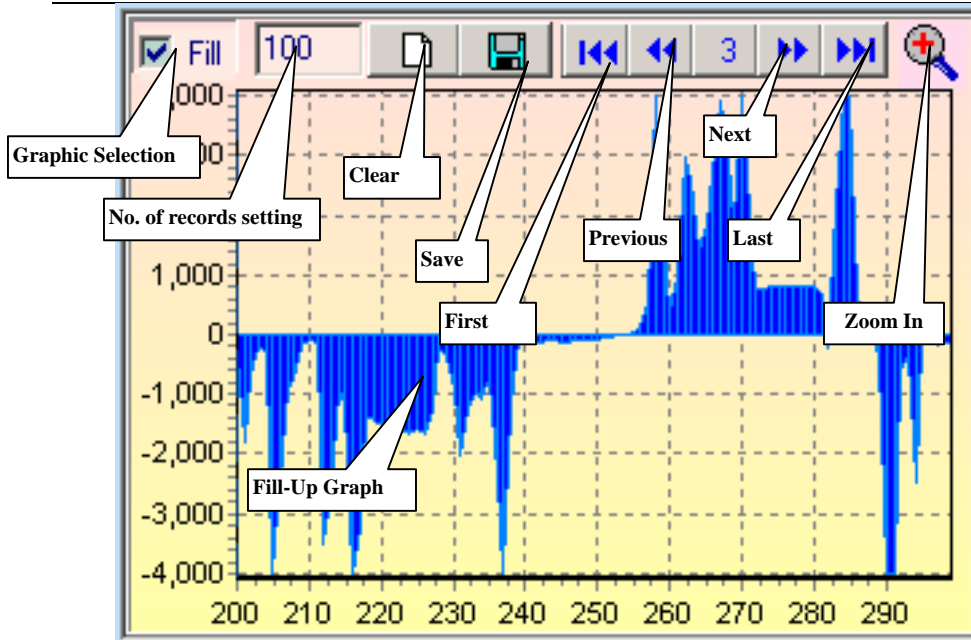
First: Go to the first graphic.

Previous: Go to the previous graphic.

Next: Go to the next graphic.

Last: Go to the last graphic.

Zoom In: To enlarge part of the graphic.



(figure 1)

E. Data Recording Operations (see figure 2)

During the connection, you can select the following functions by clicking the corresponding icon:

Repeat: Click the box to keep the repeat record, or unclick the box to ignore the repeat record.

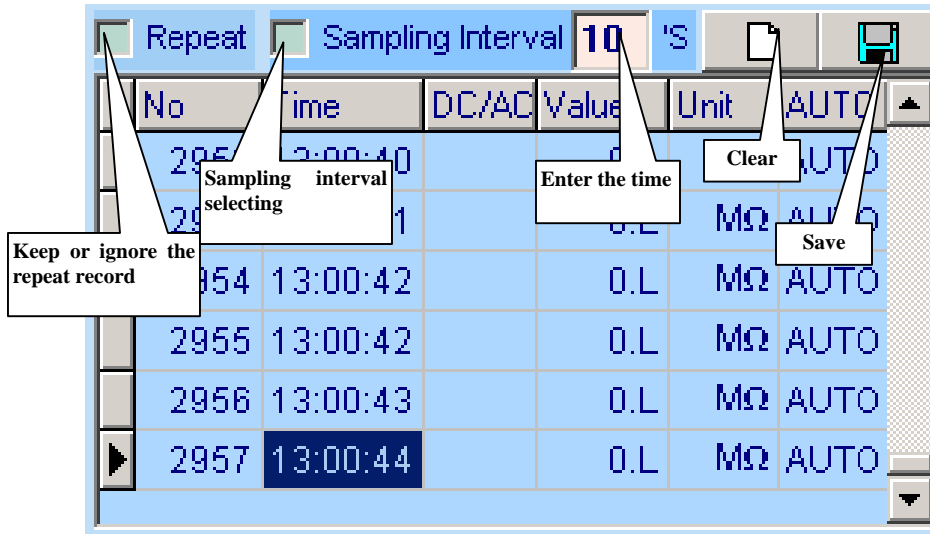
VC820/VC840 Computer Interface Software

Sampling Interval: Click to enable sampling interval function, or unclick to disable the function

Enter the sampling interval time, the unit is second.

Clear: To clear all the records permanently.

Save: To save all the record.



(figure 2)

F. Max Min Operations (see figure 3)

MIN: Recorded maximum value.

VC820/VC840 Computer Interface Software

MIN: Recorded minimum value.

SetMax: Click to enable the SetMax function or unclick to disable.

Enter the upper limit value in full digit, it does not identify range or function.

SetMin: Click to enable the SetMin function or unclick to disable.

Enter the lower limit value in full digit, it does not identify range or function.

The Meter is connected properly to the computer and data is recording.

OL!! Overload, the recorded value exceeds the SetMax and SetMin value. It will be flashing and the computer will sound if loudspeaker is installed.

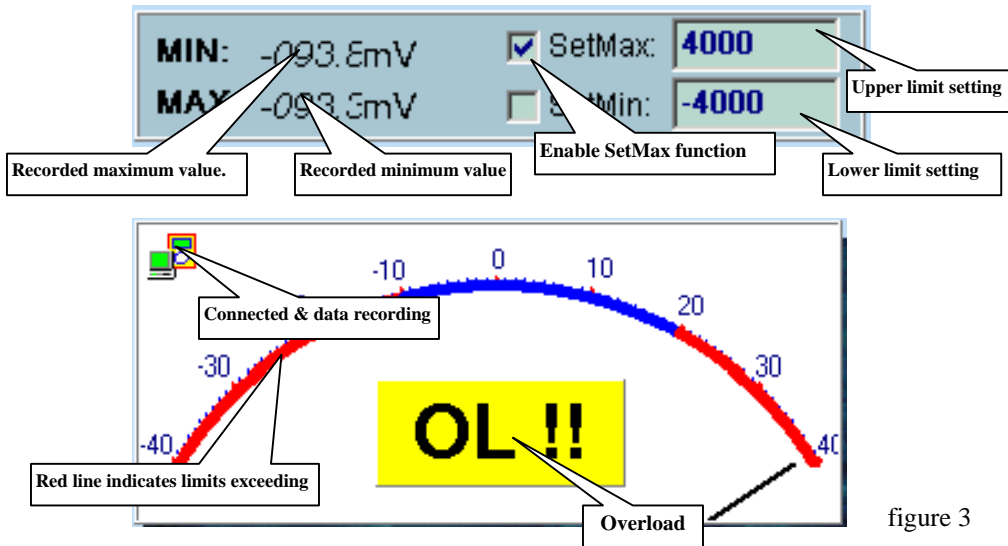


figure 3

Remarks:

1. Before you re-install the software, please remove the installed program as follows:
My Computer > Control Panel > Add/Remove Programs
2. If abnormal digits or symbols were found, please remove font "UNIT-A2" and then install new font set from "FONT" directory on the provided CD-ROM.
3. No special notice or free replacement will be provided when update version is issued.

****END****

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