

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

⚠ IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY INSTRUCTIONS

1.1. PERSONAL PRECAUTIONS

- ✓ When using this multimeter, please observe all normal safety rules concerning:
 - Protection against the dangers of electric current.
 - Protection of the meter against misuse.
- ✓ Full compliance with safety standards can only be guaranteed if used with the test leads supplied. If necessary, they must be replaced with genuine Sealey leads with the same electronic ratings. Failure to do so will invalidate the warranty.
- ✗ **DO NOT** use leads if damaged or if the wire is bared in any way.

1.2. GENERAL SAFETY INSTRUCTIONS

- ✓ Familiarise yourself with the application and limitations of the multimeter as well as the potential hazards. *IF IN ANY DOUBT CONSULT A QUALIFIED ELECTRICIAN.*
- ✓ When the meter is connected to a circuit, do not touch unused meter terminals.
- ✓ When the value scale to be measured is unknown, set the range selector to the highest value.
- ✓ Before rotating the range selector to change functions, disconnect test leads from the circuit under test.
- ☐ **WARNING!** Never perform resistance measurements on live circuits.
- ✓ Always be careful when working with voltages above 60Vdc or 30Vac rms. Keep your fingers behind the probe barriers while measuring.
- ✓ Before attempting to insert transistors for testing, ensure that test leads have been disconnected.
- ✓ Components should not be connected to the transistor socket when making voltage measurement with the test leads.
- ✓ When not in use, store the multimeter carefully in a safe, dry, childproof location. Storage temperature

2. FEATURES

Auto-ranging multimeter with hi-contrast LCD display, 16mm high digital read-out and analogue bar graph. Durable case with protective boot, probe storage and integral two-position stand. Suitable for the toughest workshop conditions. Includes data hold and audible continuity test. Supplied with probe test leads.

Layout: (Fig.1)

- | | | |
|---|----------------------------|--------------|
| 1. Range control | 4. Transistor test socket | 7. COM input |
| 2. Data hold | 5. Function Switch | 8. mA input |
| 3. AC/DC Current or $\rightarrow / \rightarrow$ | 6. V / Ω input jack | 9. 10A input |

Measures:

- AC and DC Voltage
- AC and DC Current
- Resistance
- Capacitance
- Frequency
- Diode Test
- Audible Continuity
- Transistor Test

Function	Red Lead Connection	Input Limits
DCV/ACV	V Ω	1000V DC or 750V rms AC
kHz	V Ω	250V DC or rms AC
$\Omega / \rightarrow / \rightarrow$	V Ω	250V DC or rms AC
$\mu A / mA$	mA	300mA DC or rms AC
nF / μF	mA	0.3A Fuse Protected
A	A	10A DC or rms AC
$\mu A / mA$ and A ranges are protected by fuses		

Fig.1.



3. OPERATION

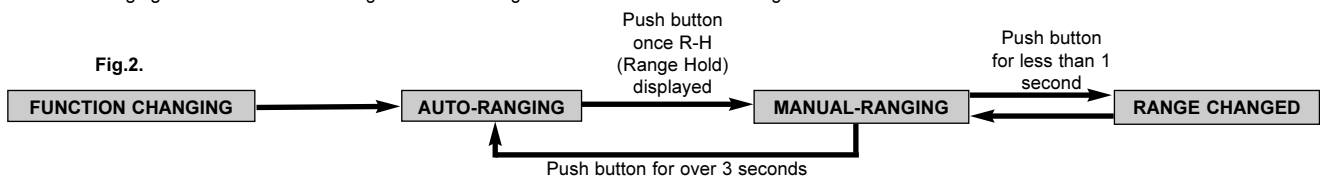
- ☐ **WARNING!** Ensure that you read, understand and apply the safety and operational instructions before connecting the multimeter. Only when you are sure that you understand the procedures is it safe to proceed with testing. Operating temperature range 0°C to 40°C.

Remember to turn on multimeter before use and to turn it off when measurement is completed.

NOTE: WHEN THE FIGURE '1' IS DISPLAYED, IT INDICATES AN OVER-RANGE SITUATION AND A HIGHER RANGE NEEDS TO BE SELECTED.

3.1. Range control button.

- 3.1.1. Ranges for AC/DC voltage, AC/DC current (μA and mA only). Resistance and Frequency measuring can be selected manually or handled by autoranging. Push this button as in Fig.2. to choose range control mode and desired ranges.



3.2. Data-hold button.

- 3.2.1. Press this button to hold the last reading in the display. The D-H symbol will appear to show data is held, the display will remain held until you either press the Data-hold button again or rotate the function switch to another function.

3.3. AC/DC Current or $\rightarrow / \rightarrow$ selecting button.

- 3.3.1. Press this button to select AC or DC current measuring function when the function switch is set at μA , mA or A positions.
- 3.3.2. Press this button to select $\rightarrow / \rightarrow$ measuring function when the function switch is set at $\rightarrow / \rightarrow$ range.

3.4. MEASURING VOLTAGE

- 3.4.1. Connect the black test lead to the COM input socket and the red test lead to the V/ Ω input socket.
- 3.4.2. Set the rotary switch to the required V \rightarrow (dc) or V \rightarrow (ac) range and connect test leads across the source or load under measurement. The polarity of the red test lead connection will be indicated when measuring dc voltages.

3.5. Measuring current

- 3.5.1. Connect the black test lead to the COM input socket and the red test lead to the mA input socket for measuring a maximum of 300mA. For a maximum of 10A connect the red lead to the 10A socket.
- 3.5.2. Set the rotary switch to the required μA , mA or A range to be used and push the $\overline{\text{---}} / \sim$ button to select DCA or ACA measuring mode.
- 3.5.3. Connect the test leads in series with the load in which the current is to be measured.
- 3.5.4. Read the LED display. In DC current measurement, the polarity of the RED lead connection will be indicated at the same time as the current value.

3.6. Measuring resistance

- 3.6.1. Connect the black lead to the COM input socket and the red test lead to the V/Ω input socket (the polarity of the red lead is '+').
- 3.6.2. Set the rotary switch to the required ' Ω ' range and connect the test leads across the resistance under measurement.
- 3.6.3. For resistance over $3.26\text{M}\Omega$ the meter may take a few seconds to stabilize the reading. This is normal for high resistance measuring.
- 3.6.4. When the input is not connected i.e. open circuit, the figure 'OL' will be displayed for the overrange condition.
- 3.6.5. When checking in-circuit resistance, ensure that the circuit under test has all power removed and all capacitors have been fully discharged.

3.7. Continuity/diode testing

- 3.7.1. Connect the black lead to the COM input socket and the red lead to the V/Ω input socket (the polarity of the red lead is '+').
- 3.7.2. Set the rotary switch to the $\text{diode} / \text{continuity}$ position and push the $\text{diode} / \text{continuity}$ button to select continuity or diode test mode.
- 3.7.3. In continuity testing, if the circuit resistance under test is lower than 20Ω , the built in buzzer will sound.
- 3.7.4. If diode mode is selected, connect the RED and BLACK test leads to the anode and cathode of the diode under test. The forward voltage drop of this diode will be displayed.

3.8. Capacitance Measurement

- 3.8.1. Connect the black test lead to the COM jack and the RED test lead to the mA/Cx jack.
- 3.8.2. Set the function switch to nF or μF position to be used. NOTE: polarity of red lead is positive '+'.
3.8.3. Connect the test leads across the capacitor under measurement and be sure connection polarity is correct.
- NOTE: When checking in-circuit capacitance, be sure the circuit has all the power removed and all capacitors are fully discharged. The range control mode in capacitance measurement is manual ranging and two ranges are provided (32nF and $32.6\mu\text{F}$). If the range control button is used in this function measurement, decimal points may be at incorrect positions.

3.9. Frequency measurement.

- 3.9.1. Connect the black test lead to the COM jack and the RED to the V/Ω JACK.
- 3.9.2. Set the function switch to the kHz position and connect the test leads across the source or load under measurement.
- NOTE: The input voltage should be between 200mV and 10V rms AC. If the voltage is more than 10Vrms, reading may be out of the accuracy range.

3.10. Transistor hFE measurement

- 3.10.1. Set the rotary switch to the hFE position.
- 3.10.2. Determine whether the transistor to be tested in NPN or PNP type and locate the Emitter, Base and Collector leads. Insert leads of the transistor into the correct holes in the transistor testing socket.
- 3.10.3. The meter will show the approximate hFE value at test conditions of base current $10\mu\text{A}$ and V_{ce} 3.2V.

4. SPECIFICATION

AC VOLTAGE		
Range	Accuracy	Resolution
3.26V	$\pm 0.8\%$ of reading ± 3 digits	1mV
32.6V	$\pm 0.8\%$ of reading ± 3 digits	10mV
326V	$\pm 0.8\%$ of reading ± 3 digits	0.1V
750V	$\pm 0.8\%$ of reading ± 3 digits	1V
Input impedance: $10\text{M}\Omega$ for 326mV range.		

DC VOLTAGE (auto ranging)		
Range	Accuracy	Resolution
326mV	$\pm 0.5\%$ of reading ± 2 digit	0.1mV
3.26V	$\pm 0.3\%$ of reading ± 2 digit	1mV
32.6V	$\pm 0.3\%$ of reading ± 2 digit	10mV
326V	$\pm 0.3\%$ of reading ± 2 digit	0.1V
1000V	$\pm 0.5\%$ of reading ± 2 digits	1V
Input impedance: $10\text{M}\Omega$ more than $100\text{M}\Omega$ for 326mV range.		

CAPACITANCE (Manual Range)		
Range	Accuracy	Resolution
32nF	$\pm 3.0\%$ of reading ± 5 digits	0.1nF
32.6 μF	$\pm 3.0\%$ of reading ± 5 digits	10nF

RESISTANCE (Auto Ranging)		
Range	Accuracy	Resolution
326 Ω	$\pm 0.8\%$ of reading ± 3 digits	0.1 Ω
3.26k Ω	$\pm 0.8\%$ of reading ± 1 digit	1 Ω
32.6k Ω	$\pm 0.8\%$ of reading ± 1 digit	10 Ω
326k Ω	$\pm 0.8\%$ of reading ± 1 digit	100 Ω
3.26M Ω	$\pm 0.8\%$ of reading ± 1 digit	1k Ω
32.6M Ω	$\pm 1.2\%$ of reading ± 2 digits	10k Ω

DC CURRENT (Auto Ranging for μA and mA)		
Range	Accuracy	Resolution
326 μA	$\pm 1.2\%$ of reading ± 3 digit	0.01 μA
3260 μA	$\pm 1.2\%$ of reading ± 3 digit	0.1 μA
32.6mA	$\pm 1.2\%$ of reading ± 3 digit	1 μA
326mA	$\pm 1.2\%$ of reading ± 3 digit	10 μA
10A	$\pm 2.0\%$ of reading ± 5 digits	0.1mA
Overload protection: 0.3A/250V fused. 10A/250V fused.		

Frequency (Auto Ranging)		
Range	Accuracy	Resolution
32.6kHz	$\pm 1.2\%$ of reading ± 3 digit	10Hz
200kHz	$\pm 2.5\%$ of reading ± 3 digit	100Hz
Sensitivity: 200mV up to 50kHz, 1V 50kHz to 200kHz		

AC CURRENT (Auto Ranging for μA and mA)		
Range	Accuracy	Resolution
326 μA	$\pm 1.5\%$ of reading ± 5 digits	0.1 μA
3260 μA	$\pm 1.5\%$ of reading ± 5 digits	1 μA
32.6mA	$\pm 1.5\%$ of reading ± 5 digits	10 μA
326mA	$\pm 1.5\%$ of reading ± 5 digits	0.1mA
10A	$\pm 3.0\%$ of reading ± 7 digits	10mA
Overload protection: 0.3A/250V and 10A/250V fuse		

5. MAINTENANCE

- WARNING!** Before attempting to open the case, ensure that test leads have been disconnected from measurement circuits to avoid electric shock hazard.
- 5.1. For continued protection against fire, replace fuse only with another of the same rating (0.5A/250V fast blow, 10A/250V fast blow). Fuse is located under the circuit board. To gain access to the fuse remove the three screws from the rear of the meter, lift of the rear cover and gently lift the circuit board from the front cover, replace the fuse and re-assemble in reverse order. **NOTE: take care not to touch any of the internal components.**
- 5.2. If the battery sign $\text{---} \text{+}$ appears on the LCD display, it indicates that the battery should be replaced. Remove the meter from the outer protective casing. Remove the rear cover retaining screws and lift off the back cover. Replace the battery. (9V PP3)
- 5.3. **SPARE PARTS** **MM402-V2.01.....FUSE 0.5A** **MM402-V2.02.....FUSE 10A** **MM30/L.....LEADS**

6. DECLARATION OF CONFORMITY

Declaration of Conformity We, the sole UK importer, declare that the product listed below is in conformity with the following standards and directives.

DIGITAL MULTIMETER
Model: MM402.V2

73/23/EEC Low Voltage Directive
89/336/EEC EMC Directive
93/68/EEC CE Marking Directive



The construction file for this product is held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.

Signed by Mark Sweetman

1st January 2005

For Jack Sealey Ltd. Sole UK importer of Sealey Professional Tools.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this equipment.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.



Sole UK Distributor
Sealey Group,
Bury St. Edmunds, Suffolk.



01284 757500



01284 703534



www.sealey.co.uk



sales@sealey.co.uk