DRAPER Expert

EN

Original Instructions
Version 3
June 2024

400 SERIES

AUTO RANGING CLAMP METER

41911

UK CA CE

1. Preface

1.1 Product Reference

User Manual for: 400 Series Auto Ranging Clamp Meter

Stock No: 41911

Part No: DCM401

Read this manual in full before using this product and retain it for future use. Always use the latest version of the manual. Please visit **drapertools.com/manuals** for the latest version.

1.2 Revisions

Version 1: March 2017 – First release

Version 2: June 2017

Version 3: June 2024

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3. Product Introduction

3.1 Intended Use

This meter is designed to measure voltage, current and resistance across AC and DC circuits. Fitted with a LCD backlit display screen, and work light.

Any other application beyond the conditions established for use will be considered misuse. Draper Tools accepts no responsibility for improper use of this product.

Part of our core range, this product is suitable for regular use by enthusiasts and tradespersons alike.

3.2 Specification

Stock No.	**41911**
Part No.	**DCM401**
Jaw Opening Max. Size:	36mm (approx)
Battery Type:	3 x 1.5V AAA (not supplied)
Meter Rating:	CAT 111 600V
Overload Protection:	600V DC or AC (RMS)
Dimensions:	208 X 78 X 35mm
Weight (approx.):	340g (including battery)
Operation Conditions	
Working Temperature:	0 - 40°C
Storage Temperature:	-10 - 60°C
Humidity:	<75%

DC Voltage

Range	Accuracy	Resolution
400mV	±0.8% reading + 3 digits	0.1mV
4V		0.001V
40V		0.01V
400V		0.1V
600V	±1% reading + 3 digits	1V

Input impedance: 10MΩ.

AC Voltage

Range	Accuracy	Resolution
400mV	±1.5% reading + 10 digits	0.1m
4V	±1.5% reading + 5 digits	0.001V
40V		0.01V
400V		0.1V
600V		1V

Input Impedance: 10MΩ.
Frequency Response: 40Hz~400Hz, Sinusoidal RMS (Average Responding).
NOTE: Manual range required for AC 400mV.

Resistance

Range	Accuracy	Resolution
400Ω	±1.2% reading + 3 digits	0.1Ω
4kΩ		0.001kΩ
40kΩ		0.01kΩ
400kΩ		0.1kΩ
4MΩ		0.001MΩ
40MΩ	±2% reading + 5 digits	0.01MΩ

Capacitance

Range	Accuracy	Resolution
5nF	±3% reading + 10 digits	0.001nF
50nF		0.01nF
500nF		0.1nF
5μF		0.001μF
50μF		0.01μF
200μF		0.1μF

Diode

Range	Resolution	Function
1V	0.001V	Displaying approximate forward voltage drop of diode.

Continuity Test

Range	Resolution	Function
When the built-in buzzer sounds, the measured resistance is less than 50Ω.		Open circuit voltage: about 0.5V

Frequency/Duty

Range	Accuracy	Resolution
10Hz	±0.8% reading + 3 digits	0.01Hz
100Hz		0.1Hz
1kHz		0.001kHz
10kHz		0.01kHz
100kHz		0.1kHz
1MHz		1kHz
10MHz		10kHz
0.1~99.9%	±3% reading + 3 digits	

Imput impedance: 10MΩ.

AC Current

Range	Accuracy	Resolution
4A	±3.5% reading + 20 digits	0.001A
40A	±3% reading + 10 digits	0.01A
400A	±2.5% reading + 10 digits	0.1A
600A	±1.5% reading + 5 digits	1A

Temperature Measurement

Range	Accuracy	Resolution
-20°C~1000°C	±3% reading + 3 digits	1°C

4. Health and Safety Information

Important: Read all the Health and Safety instructions before attempting to use this product. Failure to read these instructions may result in serious injury or death.

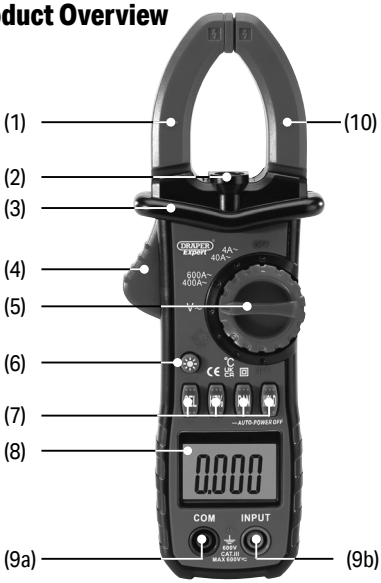
WARNING! Contact with live circuits can result in severe electrical shock. When measuring voltage above 30V, current above 10mA or AC power with an inductive load, take care not to touch the exposed contacts as they may give a serious electric shock.

  - **DO NOT** measure voltages above 600V DC or AC (RMS).
  - **DO NOT** apply voltages to the probes whilst measuring current, diodes, continuity or capacitors.
  - Discharge all high-voltage capacitors before measuring capacitance.
  - **DO NOT** clamp both the live and neutral wires at the same time during the measurement.
  - Remove the test leads from the meter when measuring using the clamp.
- **ONLY** trained and competent personnel may operate this device.
- Use this product **ONLY** as instructed in this manual.
- Use **ONLY** accessories and spare parts supplied by Draper Tools.
  - **DO NOT** use any other leads with this product than those supplied. Contact Draper Tools for replacement options if the leads become damaged.
  - If the battery must be replaced, use one with the same specification.
- Observe all standard precautions and good practice when working with live electrical currents.
- Inspect the product for damage before every use, particularly the contact tips.
  - **DO NOT** use this product if the device or probe leads are damaged in any way or if there is evidence of battery leakage.
  - If battery acid comes into contact with your skin, wash it off immediately with plenty of clean water.
  - If battery acid comes into contact with your eyes, flush them with plenty of clean water and seek immediate medical attention.
- Ensure that the device is clean, dry and free from grease before use.
- Ensure that the function dial is in the correct position before taking a measurement.
- **DO NOT** use this product if it exhibits abnormal behaviour and have it checked by a qualified and authorised technician before next use.
- **DO NOT** exceed the maximum rated capacity per function for this device as it may expose you to a shock hazard.
- Ensure that the probe contacts are disconnected from the load or test circuit before moving the function dial.
- Assess any specific additional risks to the operator before each use.
- **DO NOT** expose this product to excessive ambient temperature, high humidity, flammable substances or environments that produce a strong magnetic field.
- **DO NOT** use this this product around explosive gases, vapours or dust.
- **DO NOT** immerse this device in water or expose it to wet conditions.
- **ALWAYS** wear protective insulated gloves while using this product.
- Keep your fingers behind the guards on the probes and clamp during use.
- **ALWAYS** remove the contact leads from the device before removing the battery cover or opening the back panel.
- **DO NOT** operate this device with the rear housing open or missing and **DO NOT** use it if the rear housing cannot be closed properly.
- **NEVER** insert the probe contacts into the device sockets.
- **DO NOT** abuse, mutilate or burn the battery.
- Ensure the battery is fitted in the correct +/- orientation.
- Remove the batteries when the product is stored for extended periods.
- **DO NOT** attempt to repair this device; it contains no user-serviceable parts.
- Keep this product out of reach of children.

WARNING! ALWAYS ensure that the operator is not in contact with the ground while taking measurements, using insulating materials to prevent the current from earthing.

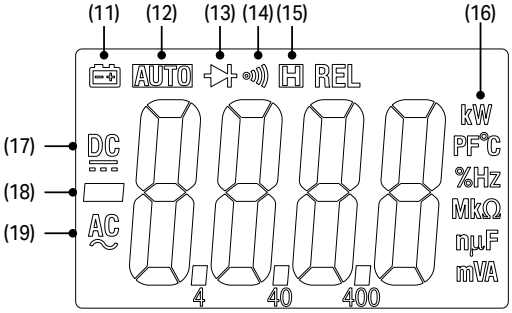
5. Identification and Unpacking

5.1 Product Overview



(1) Measurement clamp head.
(2) Inspection light.
(3) Protection guard
(4) Clamp trigger.
(5) Measuring function selection dial.
(6) Back light & work light.
(7) Function buttons.
(8) Display.
(9) Probe sockets.
  (9a) (COM) Common earth probe
  (9b) INPUT (VΩ)
(10) Current direction marking.

5.2 LCD Display



(11) Battery low indicator.
(12) Automatic range indicator.
(13) Diode checking indicator.
(14) Continuity checking indicator.
(15) Data hold indicator.
(16) Units of measurement indicator.
(17) DC signal measurement indicator.
(18) Negative indicator.
(19) AC signal indicator.

5.2 What's in the Box?

Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment.

Before assembling the product, lay the contents out and check them against the parts listed below. If any part is damaged or missing, do not attempt to use the product. Please contact the Draper Helpline; contact details can be found at the back of this manual.

A. Storage case.
B. Test probe
C. Temperature probe
D. Test probe caps

5.3 Packaging

Keep the product packaging for the duration of the warranty period in case the product needs to be returned for repair.

WARNING! Keep packaging materials out of reach of children. Dispose of packaging correctly and responsibly and in accordance with local regulations.

6. Operating Instructions

Important: Before operating this product, read and understand all the safety instructions listed in this manual.

6.1 'SEL' Function Button

Press the '**SEL**' button to switch between measurement functions when using the function selection dial.

6.2 'RAN' Function Button

Press the '**RAN**' button to switch between AUTO and manual range. The default when selected is AUTO.

Press and hold for more than 2seconds to switch from manual back to AUTO.

6.3 ☀ Button

Press and hold the '☀' button to switch the back light/ inspection light on or off.

Note: The inspection light will only come on while in **AC** current function. The lights will automatically turn off after 15minutes.

6.4 Automatic Shutdown Function

If the meter is not used for approx. 30 minutes the meter will automatically shut down. The meter will give a warning buzz approx. 1 minute before.

6.5 HOLD Button

Press the '**HOLD**' button to hold the reading while taking a measurement. The value and '**H**' will be displayed on the screen.

6.6 AC & DC Voltage Measurement

1. Rotate the measurement function selection dial to the **DC** voltage position.
2. Press the '**SEL**' button to select **AC** or **DC** voltage measurement function.
3. Connect the black lead to the **COM** probe socket (9a) and the red lead to the **INPUT** socket (9b).
4. The measured value is read from the display.

6.7 AC Current Measurement

⚠ **WARNING!** Risk of electric shock. **DO NOT** measure current using the probes. Remove the test leads from the meter when measuring with the clamp head.

1. Rotate the measurement function selection dial to the appropriate current.
2. Press the trigger to open the clamp, pass the wire to be measured into the centre of the clamp, and then slowly release the trigger until the clamp is fully closed.
3. The measured value is read from the display.

Note: The instrument can only measure one current conductor at a time.

6.8 Resistance measurement

⚠ **WARNING!** Risk of electric shock. When measuring the impedance on the line, make sure that the circuit power is off and the capacitors on the circuit are fully discharged.

1. Rotate the measurement function selection dial to the resistance (**Ω**) position and ensure that the power to the circuit under test is off.
2. Press the '**SEL**' button to select the resistance (**Ω**) measurement function.
3. Connect the black lead to the **COM** probe socket (9a) and the red lead to the **INPUT** probe socket (9b).
4. The measured value is read from the display.

Note: When there is no input (e.g. open circuit), the display will show '**OL**' indicating that the measured value is out of range. If the measured resistance is greater than 1MΩ, it may take a few seconds for the meter to stabilize the reading. This is normal for high impedance measurements.

6.9 Capacitance Measurement

WARNING! Risk of electric shock. To avoid electrical shock, the capacitor should be fully discharged before measuring.

1. Rotate the measurement function selection dial to the capacitance (⊣( ) position, and ensure that the power is cut off to the circuit under test.
2. Press the '**SEL**' button to select the capacitance (⊣( ) measurement function.
3. Connect the black lead to the **COM** probe socket (9a) and the red lead to the **INPUT** probe socket (9b).
4. The measured value is read from the display.

Note: When measuring large capacitance it can take a short time for a stable reading.

6.10 Continuity measurement:

WARNING! Risk of electric shock. Make sure the circuit power is off, and the circuit capacitors completely discharged.

1. Rotate the measurement function selection dial to the continuity (◦)))) measurement position.
2. Press the '**SEL**' button to select the continuity (◦)))) measurement function.
3. Connect the black lead to the **COM** probe socket (9a) and the red lead to the **INPUT** probe socket (9b).
4. If the measured resistance is less than 50Ω, the buzzer will sound.

6.11 Diode Test

WARNING! Risk of electric shock. When measuring diodes in line, make sure that the circuit power is off and the capacitors on the circuit are fully discharged.

1. Rotate the measurement function selection dial to the diode, (⊣▸) position, press the '**SEL**' button to select the diode (⊣▸) measurement function.
2. Connect the black lead to the **COM** probe socket (9a) and the red lead to the **INPUT** probe socket (9b).
3. Connect the black and red pen test leads to the anode and cathode of the diode.
4. The measured value is read from the display. If the test leads polarity is reversed, the meter will display '**OL**' This can be used to distinguish between the anode and cathode of the diode.

6.12 Frequecy/Duty Cycle Measurements

1. Rotate the measurement function dial to the voltage or current measurement range.
2. Press the '**HZ/%**' button to select the frequency or duty cycle measurement function.
3. Connect the black and red pen test leads to the anode and cathode of the diode.
4. The measured value is read from the display.

6.13 Temperature Measurement

1. Rotate the measurement function dial to the temperature measurement position.
2. Connect the black lead of the temperature probe (C) to the **COM** probe socket (9a) and the red lead of the temperature probe to the **INPUT** probe socket (9b).
3. The measured value is read from the display.

7. Maintenance

Important: Disconnect the probes from the sockets and any other source of voltage before performing any maintenance on this product.

- Replace the probes **IMMEDIATELY** if they are damaged in any way or the conductors are exposed; contact Draper Tools for replacement options.

  Important: Replacement probes must be rated CAT III 20A.

7.1 Replacement Battery

WARNING! To avoid false readings that may result in electric shock or personal injury, replace the battery as soon as the ' ⊟+ ' symbol appears on the meter display. To avoid electrical shock or personal injury, turn off the meter and ensure that the test lead has been disconnected from the measuring circuit before opening the battery cover and replacing it with a new one.

Follow these steps to replace the battery:

1. Turn off the meter.
2. Remove all test leads from the probe sockets.
3. Unscrew and remove the battery cover.
4. Disconnect and remove the old batteries.
5. Replace with three new AAA batteries, pay attention to the battery positive and negative. Do not mix new with old batteries and do not use re-chargeable batteries.
6. Refit the battery cover and tighten the screws.

7.2 Disposal

At the end of its working life, dispose of the product responsibly and in line with local regulations. Recycle where possible.

- **DO NOT** dispose of this product with domestic waste; most local authorities provide appropriate recycling facilities.
- **DO NOT** burn or mutilate batteries; this may release toxic or corrosive substances.

8. Warranty

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Warranty period is 12months from date of purchase.

Visit **drapertools.com/warranty** for more information.

9. Explanation of Symbols


Read the instruction manual


WEEE – Waste Electrical & Electronic Equipment
Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish


For indoor use only; do not expose to rain


Class II construction (Double insulated)


European conformity


UK Conformity Assessed


Diode test


Temperature

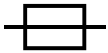

Capacitance

Frequency

Bar graph

Clamp size


Inspection/work light


Fuse


Danger! High voltage/current

Voltage AC

Voltage DC

Current AC

Current DC

Resistance in Ohms


Warning!


Continuity test buzzer

Data hold/Screen lock


Auto power off


Low battery display

Contact Details

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Please contact the Draper Tools Product Helpline for repair and servicing enquiries.