

OMEGA

HHM29
Digital Multimeter



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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification. The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected application.

SAFETY INFORMATION

The following safety information must be observed to insure maximum personal safety during the operation at this meter:

1. Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.
2. This meter is not recommended for high voltage industrial use; for example, not for measurements of 440 VAC or 600 VAC industrial power mains. The unit is intended for use with low energy circuits to 1000VDC or 750VAC or high energy circuit to 250 VAC or DC. Accidental misuse by connection across a high voltage, high energy power source when the meter is set up for mA measurement may be very hazardous.
3. Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous.
4. Use caution when working above 60V dc or 30V ac rms. Such voltages pose a shock hazard.
5. When Using the probes, keep your fingers behind the finger guards on the probes.
6. Measuring voltage which exceeds the limits of the multimeter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated on the front of the meter.
7. If the equipment is used in a manner not specified by the manufacturer, the protection provided the equipment may be impaired.

SPECIFICATIONS

Display: Liquid crystal display (LCD) with a maximum reading of 4300.

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: "1 OL" or "-1 OL" is displayed.

Low battery indication: The "🔋" is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 times per second, nominal.

Operating Environment: 0°C to 40°C at < 70% relative humidity.

Storage Temperature: -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.

Accuracy: Stated accuracy at 23°C ± 5°C, <75% relative humidity.

Safety: According to EN61010-1 protection class II overvoltage category (CAT II 1000V, CAT III 600V) pollution degree 2.

Auto Power off: 30 minutes after rotary switch and push button no changes. (except MAX/MIN function)

Power: single standard 9-volt battery.

Battery life: 150 hours typical.

Dimensions: 200mm (H) x 90mm (W) x 40mm (D).

Weight: Approx. 14 oz. (400g) including battery.

Accessories: One pair test leads, One spare fuse installed, 9V battery and Operating Instructions.

DC VOLTS

Ranges: 430mV,4.3V,43V,430V,1000V

Resolution: 100 μ V

Accuracy: $\pm(0.25\%rdg + 1dgt)$

Input impedance: >10M Ω

Overload protection: 1000VDC or 750VAC rms

AC VOLTS (50Hz-2KHz)

Ranges: 430mV,4.3V,43V,430V,750V

Resolution: 100 μ V

Accuracy:

Range	50Hz-100Hz	100Hz-500Hz	500Hz-2KHz
430mV	$\pm(1.5\%rdg+3dgts)$	N/A	N/A
4.3V	$\pm(0.75\%rdg+2dgts)$		
43V			
430V			
750V			$\pm(1.5\%rdg+3dgts)$

Input impedance: >10M Ω

Overload protection: 1000VDC or 750VAC rms

DC CURRENT

Ranges: 430 μ A,43mA,430mA,10A

Resolution: 100nA

Accuracy: $\pm(0.5\%rdg + 1dgt)$ on 430 μ A,43mA ranges
 $\pm(2.0\%rdg + 1dgt)$ on 430mA,10A ranges

Burden voltage: 1.4V on all ranges, except
1.5V on 10A range

Input protection: 0.5A / 250V fast blow fuse
10A / 600V fast blow ceramic fuse

AC CURRENT (50Hz-1KHz)

Ranges: 430 μ A,43mA,430mA,10A

Resolution: 100nA

Accuracy: $\pm(1.0\%rdg + 2dgts)$ on 430 μ A,43mA ranges
 $\pm(2.5\%rdg + 2dgts)$ on 430mA,10A ranges

Burden voltage: 1.4V on all ranges, except
1.5V on 10A range

Input protection: 0.5A / 250V fast blow fuse
10A / 600V fast blow ceramic fuse

RESISTANCE

Ranges: 430 Ω ,4.3K Ω ,43K Ω ,430K Ω ,4300K Ω ,43M Ω

Resolution: 100m Ω

Accuracy: $\pm(0.3\%rdg + 3dgts)$ on 430 Ω to 4300K Ω ranges
 $\pm(1.5\%rdg + 4dgts)$ on 43M Ω range

Audible indication: <50 \pm 30 Ω

Open circuit volts: 0.4Vdc

Overload protection: 500VDC or AC rms

CONTINUITY

Audible indication: $<50W \pm 30W$

Overload protection: 500VDC or AC rms

DIODE TEST

Accuracy: $\pm(3.0\%rdg + 3dgts)$

Resolution: 1mV

Test current: $1.0 \pm 0.6mA$

Test voltage: $<3.5V$

LOGIC TEST

Threshold: Logic Hi(\blacktriangle) ($2.8 \pm 0.8V$)

Logic Lo(\blacktriangledown) ($0.8 \pm 0.5V$)

Frequency response: 20MHz

Detectable pulse width: 25nS

Pulse limits: $>30\%$ & $<70\%$ duty

Overload protection: 500VDC or AC rms

TEMPERATURE

Ranges: $-20^{\circ}C$ to $1300^{\circ}C$

$-4^{\circ}F$ to $2372^{\circ}F$

Resolution: $1^{\circ}C$, $2^{\circ}F$

Accuracy: $\pm(2.0\%rdg + 3dgts)$ on $-20^{\circ}C$ to $500^{\circ}C$

$\pm(3.0\%rdg + 2dgts)$ on $500^{\circ}C$ to $1300^{\circ}C$

$\pm(2.0\%rdg + 6dgts)$ on $-4^{\circ}F$ to $932^{\circ}F$

$\pm(3.0\%rdg + 4dgts)$ on $932^{\circ}F$ to $2372^{\circ}F$

FREQUENCY

Ranges: 430Hz,4.3KHz,43KHz,430KHz

Resolution: 0.1Hz

Accuracy: $\pm(1.0\%rdg + 3dgts)$ @5V

Sensitivity: 500mV

Overload protection: 500VDC or AC rms

CAPACITANCE

Ranges: 4.3nF,43nF,430nF,4.3 μ F,430 μ F

Resolution: 1pF

Accuracy: $\pm(5.0\%rdg + 10dgts)$

Test frequency: 4300pF,43nF ranges 1KHz
430nF,4.3 μ F ranges 270Hz
430 μ F range 27Hz

INDUCTANCE

Ranges: 4.3mH,43mH,430mH,4.3H,43H

Resolution: 1 μ H

Accuracy: $\pm(5.0\%rdg + 20dgts)$ on 4.3mH range
 $\pm(5.0\%rdg + 10dgts)$ on 43mH to 43H ranges

Test frequency: 4.3mH,43mH ranges 1KHz
430mH,4.3H ranges 270Hz
43H range 27Hz

Test conditions: quality factor > 5 in 270Hz

OPERATION

Before taking any measurements, read the Safety Information Section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements. For normal operation when changing ranges through **0**(off) range, please wait for one second.

RANGE Button

Press (RANGE) button to select the Manual Range mode and turn off the "AUTO" annunciator.

In the Manual Range mode. each time you press (RANGE) button, the range (and the input range annunciator) increments, and a new value is displayed. To exit the Manual Range mode and return to autoranging, press and hold down (RANGE) button for 2 seconds. The "AUTO" annunciator turns back on.

MAX/MIN Button

Meter do not take records when the display reads over (+/- 4300), The negative overrange will not happen when the function of MIN is displayed.

Press (MAX/MIN) to enter the MAX MIN AVG Recording mode (manual range only). The RECORD annunciator turns on and the automatic power-off feature is disabled.

Push (MAX/MIN) to cycle through the maximum(MAX), minimum(MIN), average(AVG) and present readings. (AVG) is average last ten times reading can be displayed. Press and hold down the (MAX/MIN) for 2 seconds to exit and erase recorded reading.

A-H Button

In Auto hold mode, the meter will capture and hold the first stable non-zero (>100 digits) reading after a zero reading (<100 digits). Several consecutive measurements can be held and displayed without pressing the (A-H) button. Simply by shorting the test leads together between measurements. Press (A-H) to toggle in and out of the Auto Hold mode.

In the Auto Hold mode, the A-H annunciator is displayed.

REL D Button

Press (REL D) to enter the Relative mode, zero the display, and store the displayed reading as a reference value. The relative mode annunciator (D) is displayed.

Press (REL D) again to exit the relative mode.

D SET Button

The Relative value can also be changed by the user.

To set the Relative value, press the (D SET) to enter the D SET mode, relative value enter via yellow buttons (+/- 4300). Then press the (D SET) button, store the reference value.

Press (REL D) to enter the Relative mode, then press (D SET) to enter Relative set value as a reference value.

TIME Button

Press (TIME) to enter elapsed-time mode.


Push (TIME) to cycle through the Minutes and seconds, hours and minutes.

Press and hold down the (TIME) for 2 seconds to exit TIME mode.

Voltage Measurements

1. Connect the red test lead to the "V ω " jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the desired voltage function.
3. Connect the test leads to the device or circuit being measured.
4. For dc, a (-) sign is displayed for negative polarity; positive polarity is implied.

Current Measurements

1. Set the Function/Range switch to the desired current range and press the  toggle button to select AC or DC.
2. For current measurements less than 400mA, connect the red test lead to the mA jack and the black test lead to the COM jack.
3. For current measurements of 400mA or greater, connect the red test lead to the 10A jack and the black test lead to the COM jack.
4. Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter **in series** with the circuit.

Resistance and Continuity Measurements

1. Set the Function/Range switch to the resistance function.
2. Remove power from the equipment under test.
3. Connect the red test lead to the "V ω " jack and the black test lead to the "COM" jack.
4. Touch the probes to the test points. In ohms, the value indicated in the display is the measured value of resistance.
5. The beeper sounds continuously, if the resistance is less than $50\omega \pm 30\omega$.

WARNING

The accuracy of the functions might be slightly affected, when exposed to a radiated electromagnetic field environment, eg, radio, telephone or similar.

Diode Tests

1. Connect the red test lead to the "V \bar{w} " jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the " \rightarrow " position.
3. Turn off power to the circuit under test.
4. Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
5. Reverse probes. If the diode is good, 1 OL is displayed. If the diode is shorted, ".000" or another number is displayed.
6. If the diode is open, 1 OL is displayed, in both directions.
7. If the junction is measured in a circuit and a low reading is obtained with both lead connections, the junction may be shunted by a resistance of less than 1k \bar{w} . In this case the diode must be disconnected from the circuit for accurate testing.

Capacitance Measurements

1. Set the Function/Range switch to the desired " F " range.
2. Never apply an external voltage to the Cx sockets. Damage to the meter may result.
3. Insert the capacitor leads directly into the Cx socket.
4. Read the capacitance directly from the display.

Frequency Measurements

1. Set the Function/Range switch to the desired Hz range.
2. Connect the red test lead to the "V \bar{w} " jack and the black test lead to the "COM" jack.
3. Connect the test leads to the point of measurement and read the frequency from the display.

Inductance Measurements

1. Set the Function/Range switch to the desired "H" (inductance) range.
2. Never apply an external voltage to the Lx sockets. Damage to the meter may result.
3. Insert the inductor leads directly into the Lx socket.
4. Read the inductance directly from the display.

Logic Measurements

1. Set the Function/Range switch to the Logic position.
2. Connect the red test lead to the "V_w" jack and the black test lead to the "COM" jack.
3. Connect the red test lead to the test point and the black lead to the common buss of the logic circuit.
4. A "▲" on the display indicates TTL logic high and a "▼" indicates a TTL logic low. Both indicators are on when the point of measurement is toggling high and low.

Temperature Measurements

WARNING

Remove test leads being measured

1. Set the Function/Range switch to the "°F/°C" position.
2. Push the "°F/°C" key, select the desired °F/°C scale.
3. Connect a type k thermocouple to the jack on the instrument. Place the probe or thermocouple tip on or in the material to be measured and take the temperature reading directly from the display.

MAINTENANCE

WARNING

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. (NEDA 1604, IEC 6F22). The "🔋" appears on the LCD display when replacement is needed. To replace the battery, remove the two screws from the back of the meter and lift off the battery case. Remove the battery from battery contacts.

Fuse Replacement

If no current measurements are possible, check for a blown overload protection fuse. There are two fuses; F1 for the "mA" jack and F2 for the "10A" jack. For access to fuses, remove the two screws from the back of the meter and lift off the battery case. Replace F1 only with the original type 0.5A/250V, fast acting fuse. Replace F2 only with the original type 10A/600V, fast acting ceramic fuse.

Cleaning

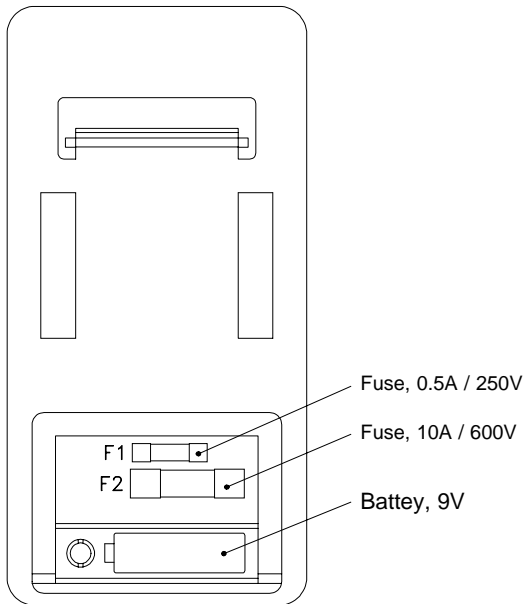
Periodically wipe the case with a damp cloth and detergent, do not use abrasives or solvents.

Additional Safety Information

- Do Not Operate the meter with the two test leads and the thermocouple probe connected at the same time. Unplug the test leads from the meter before making thermocouple temperature measurement. Unplug the thermocouple probe from the meter before making other types of measurements.
- If the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.
- Do Not Operate the meter in flammable or explosive environments.
- Protect the meter from moisture.
- Operate the meter with the two test leads provided.
- Do Not Operate the meter when the battery door is open.

ACCESSORIES	
Model No.	Description
SC-HHM20	Soft Carrying Case
HHM-TL	Replacement Test Leads

Back View Of Supermeter
Battery Door Open



WARRANTY / DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair.
2. Model and serial number of product , and
3. Repair instructions and/or specific problems relative to the product.

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- Thermocouple, RTD & Thermistor
Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

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- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

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& Flow Computers
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- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

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- Controllers, Calibrators, Simulators
& Pumps
- Industrial pH & Conductivity Equipment

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- Communications-Based
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- Plug-in Cards for Apple, IBM
& Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

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- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

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MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater
Treatment
- pH, Conductivity & Dissolved Oxygen
Instruments