

HHM9007R

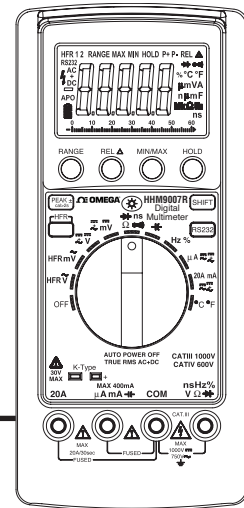
Digital Multimeter

INSTRUCTION SHEET

MQS5415/0714

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MADE IN TAIWAN



SPECIFICATIONS

- Display:** 4 5/6 digit liquid crystal display (LCD) with a maximum reading of 60000.
- Anglog bargraph:** 60 segments with measurements 20 times per second.
- Polarity:** Automatic, (-) negative polarity indication.
- Overrange indication:** "OL" mark indication.
- Low battery indication:** When change a new battery for the meter, the LCD will show the battery capacity with full sataus (). If the meter operation lasts for a few hours, the capacity indication may show half battery status (). After a long time operation, the battery may be exhausted and low battery status is shown (). Then "bAtt" displays accompanying with a continuous beep sound, and the meter shuts down in 5 seconds, and no further measurement is allowed.
- Auto power off:** approx. 30 minutes.
- Measurement rate:** 2 times per second, nominal.
- Operating environment:** 0°C to 50°C at < 70% R.H.
- Storage temperature:** -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.
- Accuracy:** Stated accuracy at 23°C $\pm 5^\circ\text{C}$, < 75% relative humidity.
- Temperature coefficient:** 0.1x(specified accuracy) /1°C(<18°C or >28°C).
- Altitude:** 6561.7 feet (2000m).
- Power:** Single 9V battery, NEDA 1604, JIS 006P, IEC 6F22.
- Battery life:** 25 hours typical with carbon-zinc.
50 hours typical with alkaline.
- Dimensions:** 198mm (H)x90mm (W)x44mm (D). • **Weight:** Approx. 400g.
- Accessories:** One pair test leads, 9V battery (installed), Operating Instructions.
- Safety:** Designed to meet IEC 61010-1(EN61010-1) CAT III 1000V, CAT IV 600V, Class II, pollution degree 2, indoor use and comply with CE.

DC VOLTS

Ranges: 600mV, 6V, 60V, 600V, 1000V **Resolution:** 0.01mV
Accuracy: $\pm(0.08\% \text{ rdg} + 5 \text{ dgts})$

Input impedance: 600mV:10M Ω ; 6V:11M Ω ;60V~1000V:10M Ω
Overload protection: 1000VDC or 750VAC rms

AC VOLTS (TRUE RMS) (45Hz - 2kHz)

Ranges: 600mV, 6V, 60V, 600V, 750V **Resolution:** 0.01mV
Accuracy: $\pm(1.0\% \text{ rdg} + 20 \text{ dgts})$ 45 ~ 500Hz
(HFR2) $\pm(1.5\% \text{ rdg} + 20 \text{ dgts})$ 500 ~ 1KHz
 $\pm(2.0\% \text{ rdg} + 20 \text{ dgts})$ 1K ~ 2kHz on 60V,600V ranges
 $\pm(2.0\% \text{ rdg} + 20 \text{ dgts})$ 45 ~ 1KHz on 750V range

Accuracy: $\pm(2.0\% \text{ rdg} + 20 \text{ dgts})$ 45~60Hz (HFR1)

Peak Hold: $\pm(3.0\% \text{ rdg} + 500 \text{ dgts})$ 45~500Hz on 60V to 750V ranges

Crest factor: ≤ 3 at Full scale and ≤ 6 at half scale

Ac couple true rms specified from 2% to 100% of range

Input impedance: 600mV:10M Ω ; 6V:11M Ω ;60V~750V:10M Ω

Overload protection: 1000VDC or 750VAC rms

(AC+DC) VOLTS (TRUE RMS) (45Hz - 2kHz)

Ranges: 600mV, 6V, 60V, 600V, 750V **Resolution:** 0.01mV
Accuracy: $\pm(1.5\% \text{ rdg} + 30 \text{ dgts})$ 45 ~ 500Hz
 $\pm(2.0\% \text{ rdg} + 30 \text{ dgts})$ 500 ~ 1KHz
 $\pm(2.5\% \text{ rdg} + 30 \text{ dgts})$ 1K ~ 2kHz on 60V,600V ranges
 $\pm(2.5\% \text{ rdg} + 30 \text{ dgts})$ 45 ~ 1KHz on 750V range

Crest factor: ≤ 3 at Full scale and ≤ 6 at half scale

Ac couple true rms specified from 2% to 100% of range

Input impedance: 600mV:10M Ω ; 6V:11M Ω ;60V~750V:10M Ω

Overload protection: 1000VDC or 750VAC rms

CURRENT

Ranges: 600 μA , 6000 μA , 60mA, 400mA, 20A **Resolution:** 0.01 μA

DC Accuracy: $\pm(0.5\% \text{ rdg} + 10 \text{ dgts})$ on 600 μA to 60mA ranges
 $\pm(1.0\% \text{ rdg} + 10 \text{ dgts})$ on 400mA range
 $\pm(2.0\% \text{ rdg} + 10 \text{ dgts})$ on 20A range

AC Accuracy: (TRUE RMS) (45Hz - 1kHz)

$\pm(1.5\% \text{ rdg} + 20 \text{ dgts})$ on 600 μA to 400mA ranges

$\pm(2.5\% \text{ rdg} + 20 \text{ dgts})$ on 20A range

Peak Hold: $\pm(3.5\% \text{ rdg} + 500 \text{ dgts})$ 45~500Hz

AC+DC Accuracy: (TRUE RMS) (45Hz - 1kHz)

$\pm(2.0\% \text{ rdg} + 30 \text{ dgts})$ on 600 μA to 400mA ranges

$\pm(3.0\% \text{ rdg} + 30 \text{ dgts})$ on 20A range

Crest factor: ≤ 3 at Full scale and ≤ 6 at half scale

Ac couple true rms specified from 2% to 100% of range

Voltage burden: 0.2V on 600 μA , 60mA ranges

2V on 6000 μA , 400mA,20A ranges

Input protection: 0.5A/1000V fast blow fuse on μA /mA input
20A/600V fast blow fuse on 20A input

20A input: 20A for 30 seconds maximum cooling period followed by a 10 minutes.

RESISTANCE

Ranges: 600 Ω , 6k Ω , 60k Ω , 600k Ω , 6M Ω , 60M Ω **Resolution:** 0.01 Ω
 $\pm(0.3\% \text{ rdg} + 20 \text{ dgts})$ on 600 Ω ranges

Accuracy: $\pm(0.3\% \text{ rdg} + 10 \text{ dgts})$ on 6k Ω to 600k Ω ranges

$\pm(1.0\% \text{ rdg} + 10 \text{ dgts})$ on 6M Ω range

$\pm(3.0\% \text{ rdg} + 20 \text{ dgts})$ on 60M Ω range

Open circuit volts: -1.2Vdc typical, (-3.0Vdc on 600 Ω range)

Overload protection: 600VDC or AC rms

CONDUCTANCE (6000 counts)

Range: 60ns

Resolution: 0.01ns

Accuracy: $\pm(1.0\% \text{ rdg} + 10 \text{ dgts})$

Equivalent Resistance Range: 16.7M Ω to 100G Ω (S=Siemens=1/ Ω) ,
(1ns=1000M Ω)

Open circuit volts: -0.7Vdc typical,

Overload protection: 600VDC or AC rms

CAPACITANCE (6000 counts)

Ranges: 6nF, 60nF, 600nF, 6 μF , 60 μF , 600 μF , 6mF

Resolution: 1pF

Accuracy: $\pm(3.0\% \text{ rdg} + 30 \text{ dgts})$ on 6nF range

$\pm(3.0\% \text{ rdg} + 10 \text{ dgts})$ on 60nF to 600 μF ranges

$\pm(5.0\% \text{ rdg} + 10 \text{ dgts})$ on 6mF range

Overload protection: 600VDC or AC rms

1. The meter has a residual capacitance in the 6nF and 600nF ranges, which is normal status. Before taking measurements, press the Relative Δ button to zero the residual capacitance.

2. When the capacitor to be tested is connected, if "dis.c" symbol indicates on LCD, it means there is voltage existing in the tested capacitor and need to be discharged before testing.

TEMPERATURE

Ranges: -50°C ~ 1300°C, -58°F ~ 2372°F **Resolution:** 0.1°C, 0.1°F

Accuracy: $\pm(1.0\% + 1^\circ\text{C})$ 0°C ~ 400°C

$\pm(2.0\% + 3^\circ\text{C})$ -50°C ~ 0°C, 400°C ~ 1300°C

$\pm(1.0\% + 2^\circ\text{F})$ 32°F ~ 750°F

$\pm(2.0\% + 6^\circ\text{F})$ -58°F ~ 32°F, 750°F ~ 2372°F

Sensor type: K-type thermocouple

Overload protection: 30VDC or AC rms

FREQUENCY

Range: 60Hz, 600Hz, 6kHz,60KHz, 600kHz, 6MHz,10MHz

Resolution: 0.01Hz

Accuracy: $\pm(0.1\% \text{ rdg} + 10 \text{ dgts})$

Sensitivity: 5Hz ~ 600KHz: > 1.5Vrms; 600KHz ~ 10MHz: >2.5Vrms,<5Vrms

Minimum pluse width: > 100ns

Duty cycle limits: >30% and < 70%

Overload protection: 600VDC or AC rms

% DUTY CYCLE

Range: 5 to 95.0% **Resolution:** 0.1%

Pulse width: > 10us

Frequency range: 5% to 95% (40Hz to 1kHz)

10% to 90% (1KHz to 10KHz)

20% to 80% (10KHz to 20KHz)

Accuracy: (5V logic) $\pm(2\% \text{ rdg} + 10 \text{ dgts})$

Overload protection: 600VDC or AC rms

DIODE TEST

Test current: Approx. 0.5mA

Resolution: 0.1mV

Accuracy: $\pm(2\% \text{ rdg} + 10 \text{ dgts})$

Audible indication: <0.05V

Open circuit volts: 3.0Vdc typical

Overload protection: 600VDC or AC rms

CONTINUITY

Audible indication: Less than 40 Ω

Response time: 100ms

Overload protection: 600VDC or AC rms

High Voltage Warning (Hi-V)

>30V AC/DC meter beeps, the "⚡" lightning bolt symbol appears in the display.

AUXILIARY FEATURES

RANGE: Execute manual range mode.

HOLD: Operating on all ranges.

MAX / MIN

The "MAX" displays the maximum value of measurements. The "MIN" displays the minimum value of measurements. The "MAX/MIN" appears and flashes in the LCD to display the value that is being measured now. After finishing the measurement, press MAX/MIN button for more than 2 seconds to exit.

PEAK+/-:

1. Record the peak+ or peak- value in a measurement. It is usable with AC voltage, AC current, measurements. If the pressed time >2 sec, the PEAK function will enter to calibration mode, the LCD will show "CAL" and the internal buffer will remember the internal on/off set voltage then back to the measure mode.
2. Response time: more than 1ms.

Relative RELD

The "Δ" appears to indicate that the relative mode is activated and non-zero number is offset and saved. The flashing "Δ" appears and the offset value displays at the same time for comparison with the reading of measurement. After finishing the measurement, press "Δ" (REL) button for more than 2 seconds to exit.

BACKLIGHT: Backlight auto-off approx. 3.0 minutes.

SHIFT BUTTON: Shift ($\bar{V} \leftrightarrow \bar{A}$), ($\bar{mV} \leftrightarrow \bar{\mu A}$), ($\bar{\Omega} \leftrightarrow \bar{\mu\Omega}$) \leftrightarrow $\bar{Hz} \leftrightarrow ns$), ($\bar{Hz} \leftrightarrow \%$), ($\bar{\mu A} \leftrightarrow \bar{\mu A}$) \leftrightarrow $\bar{\mu A}$), ($20A / mA \leftrightarrow 20A / mA$) \leftrightarrow $20A / mA$), ($^{\circ}C \leftrightarrow ^{\circ}F$) ranges.

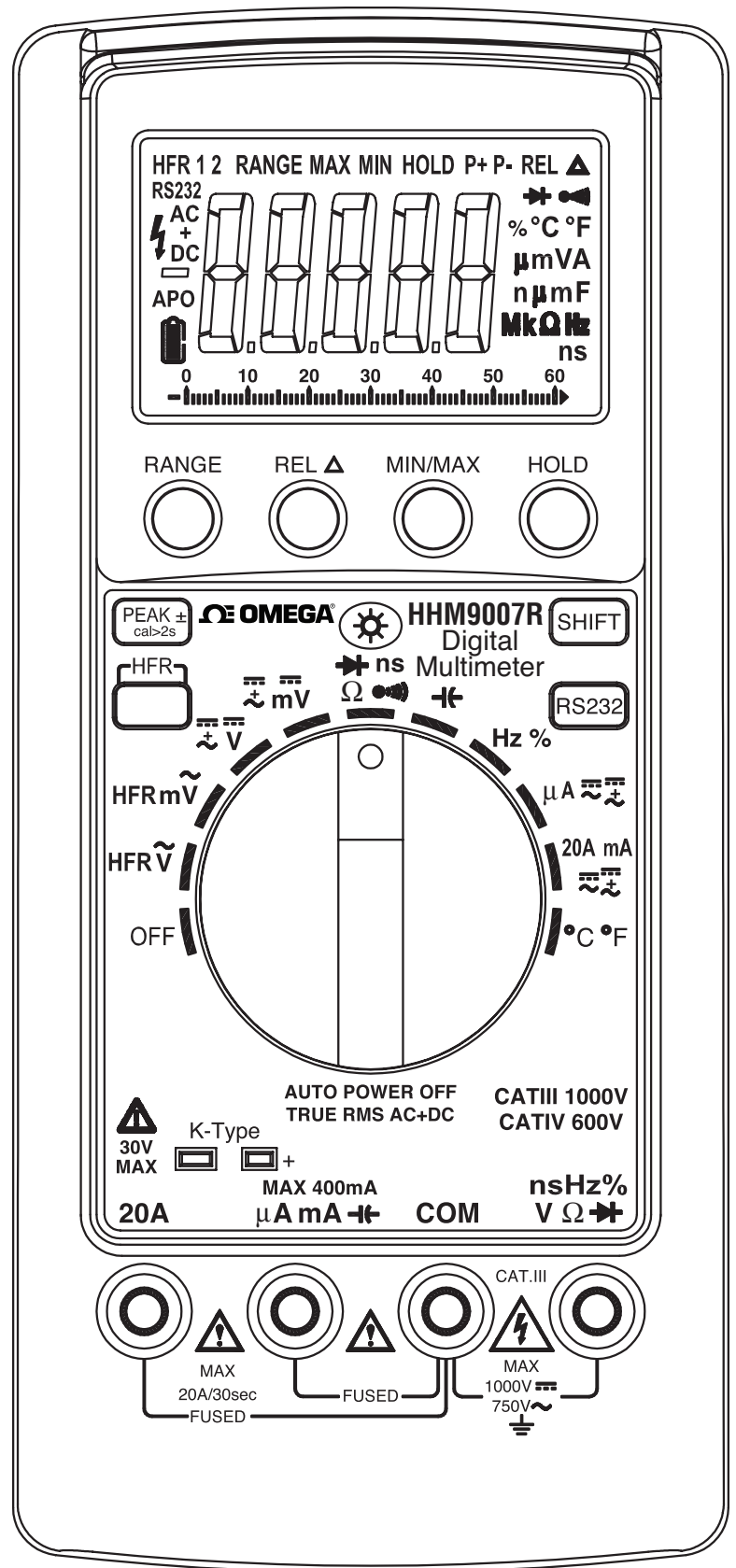
RS232 BUTTON: Operating on all ranges. (USB Interface)

HFR BUTTON: Shift "HFR1" (High Frequency reject > 1KHz) \leftrightarrow "HFR2" (High Frequency reject > 100KHz), on AC Volts ranges.

Disable Auto Power Off

Set the DMM to off position, press (MAX/MIN) button, and hold the (MAX/MIN) button while turning the rotary knob to the desired range position. Release the button when LCD displays normally. Note "APO" annunciator is missing from the LCD. The Auto Power Off mode is activated with an "APO" symbol indicating on LCD.

uA/mA, 20A, JACK: Input warning detects wrong





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WARNING: These products are not designed for use in, and should not be used for, human applications.

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's 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 malfunctions, 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 having been 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 in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS / INQUIRIES

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

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