# OMEGA

## HHM599 Digital Trms Clamp-On Meter



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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 appropriat educice 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.

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. Use caution when working above 60V dc or 30V ac rms. Such voltages pose a shock hazard.
- 3. When Using the probes, keep your fingers behind the finger guards on the probes.
- 4. Measuring voltage which exceeds the limits of the clampmeter 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.
- 5. If the equipment is used in a manner not specified by the manufacturer, the protection provided the equipment may be impaired.

## SPECIFICATIONS

**Display:** 3<sup>3</sup>/<sub>4</sub> digit (4000 counts), 9999counts (Frequency mode), 40 segments analog bar graph and function units sign annunciators.

Polarity: Automatic, positive implied, negative polarity indication.

**Overrange**: "4000"or"-4000" Most Significant Digit blinks.

- Low battery indication: the " = " is displayed when the battery voltage drops below the operating level.
- **Measurement rate:** 2/sec, nominal. 1/sec, Capacitance and Frequency mode. 20/sec, Analog display.

**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  $23^{\circ}C \pm 5^{\circ}C$ , <75% relative humidity.

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

Auto Power off: 30minutes after rotary switch or mode changes.

Clamp jaw: According to EN61010-2-032 CAT IV 600V.

**Power:** single standard 9-volt battery.

Battery life: 150 hours typical.

Dimensions: 250mm (H) x 100mm (W) x 46mm (D).

Weight: Approx. 380g including battery.

Accessories: One pair test leads, 9V battery.

DC VOLTS

Ranges: 400mV,4V,40V,400V,600V Resolution:  $100\mu$ V Accuracy:  $\pm (0.25\%$ rdg + 1dgt) on 400mV to 400V ranges  $\pm (0.25\%$ rdg + 3dgts) on 600V range Input impedance: >10Mw Overload protection: 600VDC or AC rms

#### AC VOLTS (True RMS) (50Hz-500Hz)

Ranges: 4V,40V,400V,600V Resolution: 1mV Accuracy: ±(0.75%rdg + 4dgts) on 50-60Hz ±(2.0%rdg + 4dgts) on 40-500Hz Input impedance: >10Mw Effect Reading: 100 - 3999 Overload protection: 600VDC or 600VAC rms

#### RESISTANCE

Ranges: 400W,4KW,40KW,400KW,400KW,40MW Accuracy: ±(0.3%rdg + 5dgts) on 400W range ±(0.3%rdg + 1dgt) on 4KW to 400KW ranges ±(0.5%rdg + 1dgt) on 4000KW range ±(2.0%rdg + 4dgts) on 40MW range Open circuit volts: 0.4Vdc Overload protection: 600VDC or AC rms CONTINUITY Audible indication: less than 40w ±20w Overload protection: 600VDC or AC rms

DIODE TEST Test current: 1.0mA±0.6mA Accuracy: ±(3.0%rdg + 3dgts) Open circuit volts: 3.0Vdc typical Overload protection: 600VDC or AC rms

FREQUENCY (Autoranging) Ranges: 100Hz,1KHz,10KHz,100KHz,500KHz Resolution: 0.01Hz Accuracy: ±(0.1%rdg + 2dgts) Sensitivity: 2.0Vrms min Effect reading: 10-9999 Overload protection: 600VDC or AC rms

 $\begin{array}{l} \textbf{CAPACITANCE} \\ \textbf{Ranges: } 4nF, 40nF, 400nF, 4\muF, 40\muF \\ \textbf{Accuracy: } \pm(3.0\% rdg + 20dgts) \ on \ 4n \ Frange(use \ {\tt DZERO}) \\ \pm(3.0\% rdg + 4dgts) \ on \ 40nF \ to \ 20\muF \ ranges \\ \pm(6.0\% rdg + 4dgts) \ above \ 20\muF \\ \textbf{Overload protection: } 600VDC \ or \ AC \ rms \end{array}$ 

#### DC CURRENT (Put conductor at the center of the jaws)

Ranges: 400A,700A Resolution: 100mA Accuracy: ±(1.5%rdg + 5dgts) \*700A to 1200A: ±(2.0%rdg + 5dgts) Overload protection: 1200Adc max. for 1 minute

AC CURRENT (True RMS) (40Hz-500Hz) (Put conductor at the center of the jaws) Ranges: 400A,700A Resolution: 100mA Accuracy:  $\pm(1.75\%$ rdg + 5dgts) on 50Hz-60Hz  $\pm(3.5\%$ rdg + 5dgts) on 40Hz-500Hz \*700A to 1000A(50Hz/60Hz):  $\pm(2.5\%$ rdg + 5dgts) Overload protection: 1000Aac max. for 1 minute

## 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.

## Button

Press " () " button to toggle in and out of the Data Hold mode, except if you are already in the MIN MAX Recording mode.

In the Data Hold mode, the "HOLD" annunciator is displayed and the last reading is held on the display, the beeper emits a tone. Pressing (MIN / MAX) button when you are in the Data Hold mode causes you to exit Data Hold and enter the MIN MAX Recording mode.

In the MIN MAX Recording mode, press (HOLD) button to stop the recording of readings, press (HOLD) again to resume recording.

#### **PEAK HOLD Button:** (only AC current ranges 40-60Hz)

Press "PEAK" button two times to toggle in and out of PEAK Hold mode. In the PEAK Hold mode, the "HOLD **P** " annunciator is displayed. {Accuracy: ±[10%(readind - residual offset)+10dgts], effect reading: 80~4000}

## **MIN / MAX button**

Press (MIN / MAX) button to enter the MIN MAX Recording mode. The minimum, maximum values are then reset to the present input, the readings are stored in memory, and the "HOLD" annunciator turns on. Push the button to cycle through the minimum (MIN), maximum (MAX), and present readings. The MIN or MAX annunciator turns on to indicate what value is being displayed.

In the MIN MAX Recording mode, press (HOLD) button to stop the recording of readings, press again to restart recording. If recording is stopped, the minimum, maximum, or present values and analog diaplay are frozen. In the MIN MAX Recording mode, when a new minimum value is exceed the actual minimum readings or a new maximum value is overload, the minimum or maximum value will held on the display, but the analog display continues to be active.

AC current ranges without MIN/MAX function.

#### DZERO Button

Press ( $\mathbf{p}ZERO$ ) button to enter the Relative mode, the " $\mathbf{p}ZERO$ " annunciator turn on, zero the display, and store the displayed reading as a reference value. Press and hold down the ( $\mathbf{p}ZERO$ ) button for 2 seconds to exit the relative mode.

## **RANGE Button**

Press (RANGE) button to select the Manual Range mode and turn off the "AUTO" annunciator. (The meter remains in the range it was in when manual ranging was selected).

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.

#### **Voltage Measurements**

- 1. Connect the red test lead to the "V" jack and the black test lead to the "COM" jack.
- 2. Set the Function/Range switch to the desired voltage range (AC or DC). The meter will automatically select the best voltage range.
- 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**

- Set the Function/Range switch to the desired highest 700A range (AC or DC). In DC current measurement use pZERO button, offset the residual magnetic of the jaws.
- Press the trigger to open transformer jaws and clamp onto one conductor only. Read the current directly on the display. It is recommended that the conductor be placed at the center of the closed jaws for maximum accuracy.
- 3. When the reading is lower than 400 counts, set the range switch to the next lower range position. For maximum accuracy, select the lower range possible without overranging the meter.

### **Resistance Measurements**

- 1. Set the Function/Range switch to the resistance range.
- 2. Remove power from the equipment under test.
- 3. Connect the red test lead to the "+" 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.

#### WARNING

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

## **Continuity Measurements**

- 2. Remove power from the equipment under test.
- 3. Connect the red test lead to the "+" jack and the black test lead to the "COM" jack.
- 4. Touch the probes to the test points. the beeper sounds continuously, if the resistance is less than 40W.

## **Diode Tests**

- 1. Connect the red test lead to the " + " jack and the black test lead to the "COM" jack.
- 2. Set the Function/Range switch to the "→" 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, "4000" is displayed. If the diode is shorted, ".000" or another number is displayed.
- 6. If the diode is open, "4000" is displayed in both directions.

#### **Frequency Measurements**

- 1. Set the Function/Range switch to the Hz position.
- 2. Connect the red test lead to the "+" 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.

#### **Capacitance Measurements**

- 1. Set the Function/Range switch to the " -+- " range.
- 2. Connect the test leads to the " + " jack and the black test lead to the "COM" jack.
- 3. Connect the red test lead to the capacitor and read the eapacitance dircetly from the display.

## MAINTENANCE

## WARNING

Remove test leads before changing battery 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 cover. Remove the battery from battery contacts.

#### Cleaning

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

#### 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 the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customers 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 medification. 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 trices.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

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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 <u>WARRANTY</u> 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
- Repair instructions and/or specific problems relative to the product.
- FOR <u>NON-WARRANTY</u> 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
- Repair instructions and/or specific problems relative to the product.

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