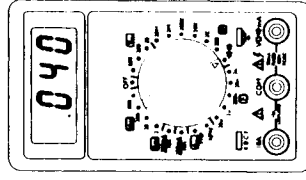


CE

User's Guide



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HHM90 Digital Multimeter



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CONTENTS

GENERAL SPECIFICATIONS	2
WARNING	3
DIGITAL DISPLAY	4
FRONT PANEL	5
DC/AC CURRENT MEASUREMENT	6
DC/AC V MEASUREMENT	8
MEASURING RESISTANCE AND TESTING CONTINUITY	10
DIODE TEST	12
CAPACITANCE MEASUREMENT.....	13
TRANSISTOR Hfe () MEASUREMENT	14
MAINTENANCE	16
SPECIFICATIONS.....	17
Q & A for the beginners	21

SYMBOLS

2

The following electrical symbols are used in this manual:

~ AC

≡ DC

▶ Diode

⊥ Capacitor

))) Beeper

⚡ EL button

Cx Capacitor plug

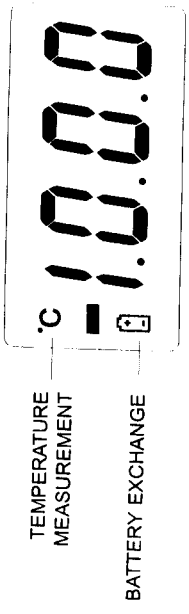
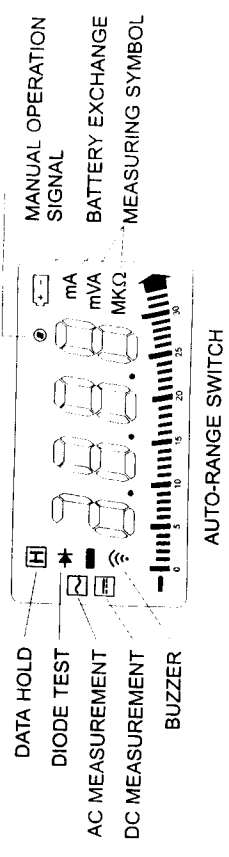
⚠ Important safety information

WARNING

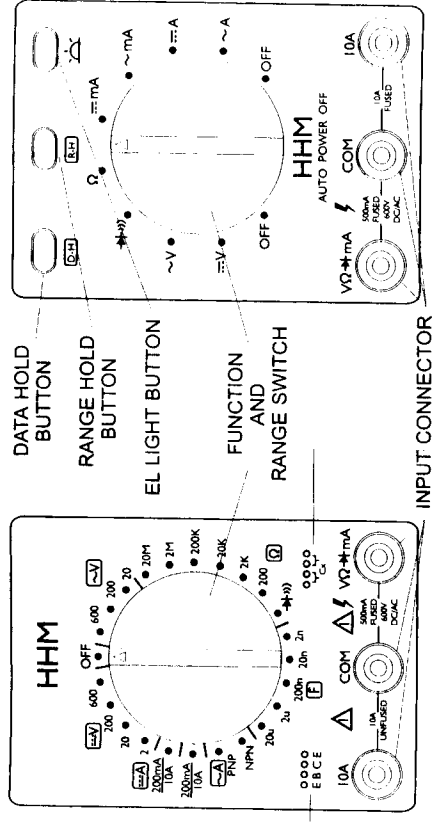
To ensure that the meter is used safely, follow all safety and operating instructions in this manual. If the meter is not used as described in this manual, the safety features of the meter might be impaired.

1. Don't touch the metal part of the test leads to prevent a electrical shock.
 2. Don't use the meter, if the rear cover is unrestored.
 3. Don't touch both poles of the test leads, during the measuring process.
 4. Ensure the range switch was set to the proper range of functional positions.
 5. Remove the battery, if the meter is not used for a long time.
-

DIGITAL DISPLAY



FRONT PANEL



DATA HOLD
BUTTON

RANGE HOLD
BUTTON

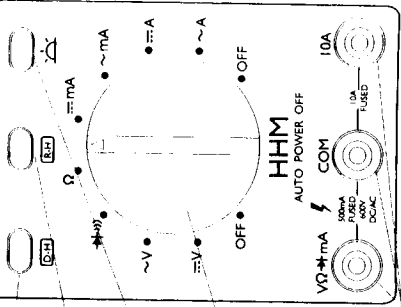
EL LIGHT BUTTON

FUNCTION
AND
RANGE SWITCH

INPUT CONNECTOR

TRANSISTOR
TEST SOCKET

CAPACITOR
TEST SOCKET



DATA HOLD
BUTTON

RANGE HOLD
BUTTON

EL LIGHT BUTTON

FUNCTION
AND
RANGE SWITCH

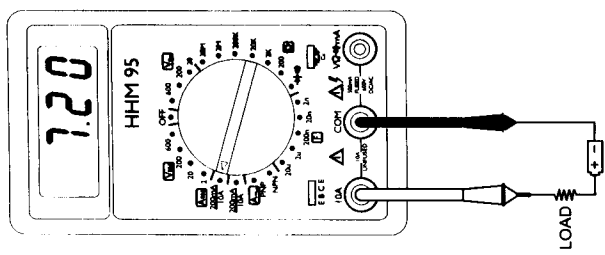
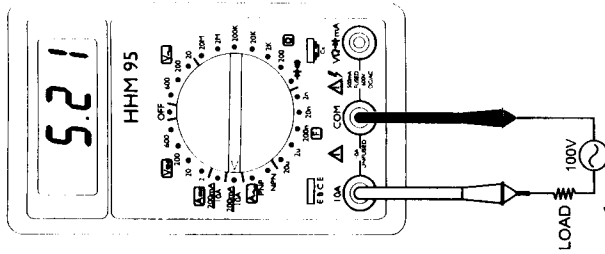
INPUT CONNECTOR

TRANSISTOR
TEST SOCKET

CAPACITOR
TEST SOCKET

DC/AC CURRENT MEASUREMENT

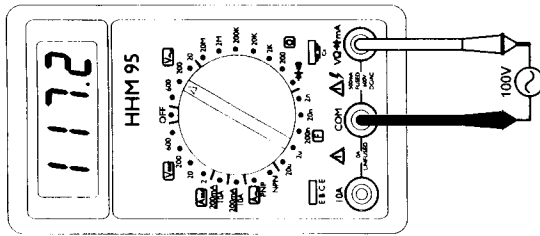
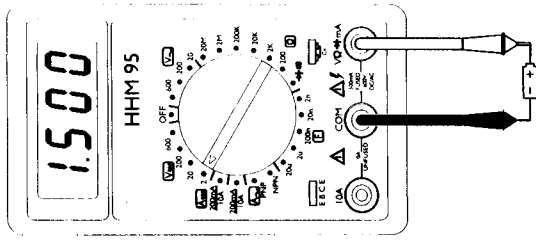
1. Set the range switch to the desired μmA position. (Set to μmA or mA in case of HHM 95).
 2. Insert the red test lead into "mA" input connector and the black test lead into "COM" input connector (into "10A" input connector in case of higher than 200 mA measurement).
 3. Connect the leads to the device or circuit to be measured, and read the data on the display.
-



DC/AC V MEASUREMENT

8

1. Set the range switch to the desired DCV or ACV position.
 2. If you can't determine the correct position, set the range switch to the highest range within Voltage range, and reduce it gradually until the satisfactory reading is obtained.
 3. Insert the red test lead into "V" input connector and the black test lead into "COM" input connector.
 4. Connect the test leads to the device or circuit to be measured, and read the data on the LCD display.
 5. Autorange can be changed into manual operation by pushing the R-H button in autorange multimeters. (HHM 97, HHM 97EL)
-



MEASURING RESISTANCE AND TESTING CONTINUITY

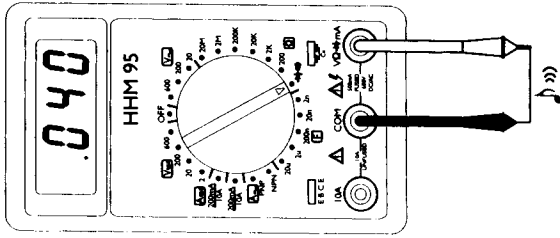
1. Insert the black test lead into "COM" input connector, and the red test lead into the input connector marked " Ω ". Turn off power to the circuit under test.
2. Set the range switch to the range marked " Ω " in measuring resistance, to "→∞" in testing continuity.
3. Touch the probes to the test points.

In ohms, read the resistance on the display.

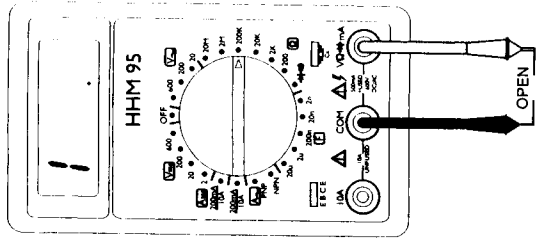
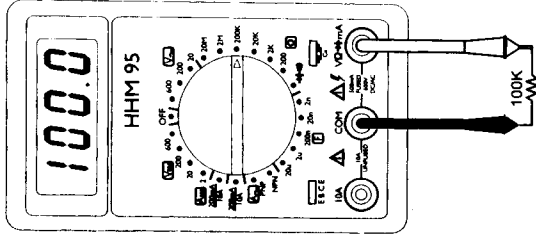
In testing continuity, beeper sounds continuously if continuity exists (resistance < 100 Ω)



CONTINUITY TEST



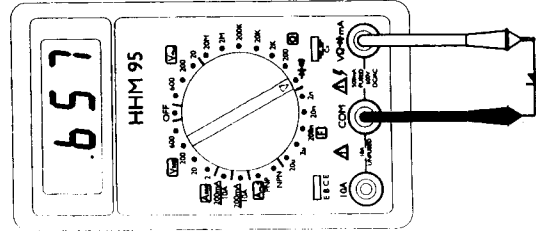
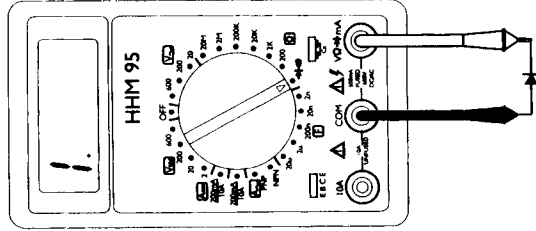
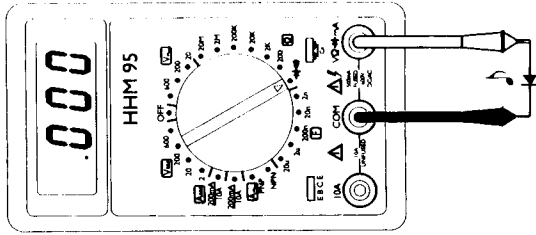
RESISTANCE



DIODE TEST

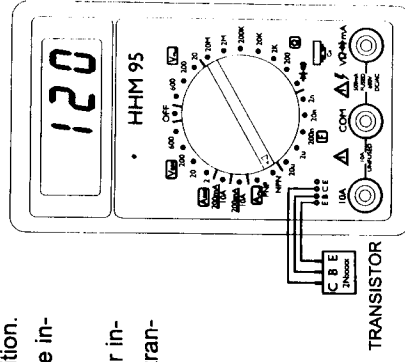
1. Set the range switch to Ω position.
2. Insert the red test lead into Ω input connector, and the black test lead into "COM" input connector.
3. Touch the red test lead to the anode of the diode, and the black test lead to the cathode of the diode.
4. Read forward voltage on digital display.
5. Reverse the test lead if the display shows "1" or "OL".
6. If it still shows "1" or "OL" or "000" on the display, that means the diode is damaged.

* Transistor junctions E,B,C, may also be determined by a similar method described above, as the emitter-base and base-collector junctions are also P-N junction diodes.



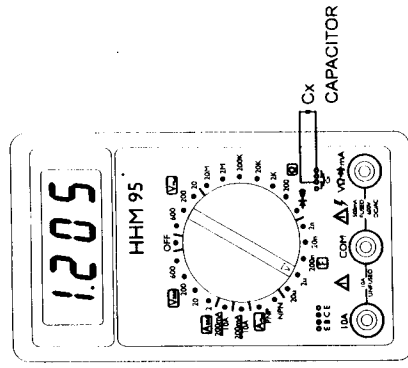
TRANSISTOR H_{fe} (β) MEASUREMENT

1. Set the switch to "NPN" or "PNP" position.
(it depends on the specification of the individual transistor.)
2. Plug the leads of the tested transistor into the correct E, B, C, holes in the transistor test socket.
3. Read the H_{fe} value on the display.



CAPACITANCE MEASUREMENT


1. Set the range switch to "F" position.
2. Discharge any capacitors before testing.
3. Insert the capacitor leads into the capacitor test socket. Because there are two groups of holes, one lead must be inserted into the hole of one of the two groups, and the other lead into the hole of the other group.
4. Read the capacitance value on the display.



MAINTENANCE

16

1. BATTERY REPLACEMENT,

- (1) Replace the battery as the low battery indication "  " appears on the display.
- (2) Remove two screws located near the bottom of the rear cover. Remove the rear cover.
- (3) Remove the battery from the meter and replace it with a new one.
- (4) Restore the rear cover and tighten the screws.

2. FUSE REPLACEMENT,

- (1) Remove test leads from the meter.
 - (2) Remove two screws located near the bottom of the rear cover. Remove the rear cover.
 - (3) Remove the fuse and replace it with a new fuse of the same rating.
 - (4) Restore the rear cover and tighten the screws.
-

SPECIFICATIONS

GENERAL:

OPERATION ENVIRONMENT: 23±5°C, relative humidity: above 75%RH

DC voltage:

RANGE: 200mV/2/20/200/600V

320mV/3.2/32/320/600V (HHM 97, HHM 97EL)

ACCURACY: ±(2.0%RDG+2DGTS)

INPUT IMPEDENCE: 10MΩ

OL. PROTECTION: AC/DC 600V

AC voltage:

RANGE: 20/200/600V

3.2/32/320/600V (HHM 97, HHM 97EL)

ACCURACY: ±(2.5%RDG+5DGTS)

INPUT IMPEDENCE: 4.5MΩ (HHM 93/10M (HHM 95, HHM 97, HHM 97EL)

OL. PROTECTION: AC/DC 600V

DCA:

RANGE: 2m/20m/200m/2000m A; 10A
32m/320mA; 10A(HHM 97, HHM 97EL)
ACCURACY: $\pm(2.0\%RDG+3DGTS)$ for mA
 $\pm(3.0\%RDG+4DGTS)$ for 10A
OL. PROTECTION: 500mA/250V(HHM 93, HHM 95, HHM 97)fuse
10A/600V(HHM 97, HHM 97EL) fuse

ACA:

RANGE: 20mA ; 10A(HHM 95); 32m/320mA; 10A(HHM 97, HHM 97EL)
ACCURACY: $\pm(2.5\%RDG+5DGTS)$ for mA
 $\pm(3.5\%RDG+5DGTS)$ for 10A fuse
OL. PROTECTION: 500mA/250V(HHM 95) fuse
10A/600V(HHM 97, HHM-97EL) fuse

RESISTANCE:

RANGE: 200/2K/20K/200K/2M/20M Ω
320/3.2K/32K/320K/3.2M/32M Ω (HHM 97, HHM 97EL)

ACCURACY: \pm (3.0%RDG+5DGTS)for 20M Ω
 \pm (5.0%RDG+7DGTS)for 32M Ω

\pm (1.5%RDG+3DGTS)for other range
OL. PROTECTION: AC/DC 500 V PTC

CAPACITANCE:

RANGE: 2n/20n/200n/2 μ /20 μ F

ACCURACY: \pm (3.0%RDG+10DGTS)

TEST VOLTAGE: \sim 50mV

TEST FREQUENCY: \sim 400Hz

HFE: RANGE: NPN;PNP

Ib: \sim 10 μ A

DISPLAY: 000-1999



DIODE TEST:

TEST CURRENT: (1.0±0.6)mA

TEST VOLTAGE: Max 3.2V

OL. PROTECTION: AC/DC 500V PTC

CONTINUITY BEEPER:

THRESHOLD RESISTANCE:<100Ω

RESPONSE TIME:<10ms

OL. PROTECTION:AC/DC 500V PTC

* The (model number)s following the data indicate the specifications for some specified models. Those without (model number) indication mean that they are general specifications for all models.

Model	Function	DCV	ACV	DCA	ACA	Ohm	Hfe	Buzzer	Capacitance
HMM 93		+	+	+		+	+		
HMM 93B		+	+	+		+	+	+	
HMM 95		+	+	+	+	+	+	+	-
HMM 97 Autorange*		+	+	+	+	+		+	
HMM 97EL Autorange*		+	+	+	+	+	+	+	

*HMM 97;HMM 97EL are both auto/menu operation modes.
HMM 97EL has backlight for use in the dark.

WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service 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. However, 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, oil, resistance, vibration, improper specification, misapplication, misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. This includes contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit. **FOR NON-WARRANTY REPAIRS,** consult OMEGA for current repair charges. Have the following information available **BEFORE** contacting OMEGA:

- 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.

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