

Uni-T UT205E Ψηφιακό Ζυγό

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INSTRUCTION MANUAL

UNI-T

Digital Clamp Meter

UT205E · UT206B · UT207B · UT208B

Foreword

Thank you for purchasing the new UNI-T clamp meter. To use this device safely and correctly, please read this manual carefully, paying special attention to the Safety Instructions section. After familiarizing yourself with the manual, we recommend storing it in an easily accessible place, preferably near the device, for future reference. Limited Warranty and Liability

Uni-Trend guarantees that the product is free from material and workmanship defects for a period of one year from the date of purchase. The warranty does not cover damages resulting from accident, neglect, misuse, modification, contamination, or improper handling of the device. The seller is not authorized to provide any other warranties on behalf of Uni-Trend. To take advantage of the warranty service during the warranty period, please contact the seller directly. Uni-Trend is not liable for any special, indirect, incidental, or consequential damages or losses arising from the use of this device. **WARNING** Before using the meter, please read the safety instructions contained in Chapter III carefully.

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I. Introduction

The UT205E / UT206B / UT207B / UT208B clamp meter is a handheld True RMS meter with a maximum reading of 6000 and automatic range selection. The device features full-scale overload protection and the following functions:

AC/DC Voltage, AC Current, Resistance, Diode, Continuity, Capacitance, Frequency, Duty Cycle, Data Hold, MAX/MIN, Relative Value

DC Current Measurement (UT207B / UT208B)

Temperature Measurement (UT206B / UT208B)

LPF (Low Pass Filter) and LoZ (Low Resistance) Voltage (UT206B / UT207B / UT208B)

Inrush Current Measurement (UT206B / UT207B / UT208B)

Analog Bar Graph (UT206B / UT207B / UT208B)

Flashlight, NCV, Low Battery Indicator, and Auto Power Off

Models UT206B / UT208B may also be equipped with a flexible current probe, which extends the AC current measurement range to 3000 A (optional accessory).

II. Accessories

Open the package and remove the meter. Check carefully to ensure that no components are missing and that none are damaged.

- a) Operating Manual 1 pc.
- b) Test Leads 1 pair
- c) Type K Thermocouple (UT206B / UT208B) 1 pc.
- d) Fabric Carrying Bag 1 pc.
- e) 1.5 V AAA Batteries 3 pcs.
- f) Flexible Current Probe (UT206B / UT208B) optional

If any of the above items are missing or damaged, please contact your supplier immediately.

III. Safety Instructions

The meter has been designed and manufactured in accordance with the safety standards IEC 61010-1, IEC 61010-2-032, and IEC 61010-2-033 and meets the requirements of CAT III 1000 V, CAT IV 600 V, double insulation, and pollution degree 2.

NOTE

Before each use, check the operation of the meter by measuring a known voltage. If the meter is used contrary to the manufacturer's recommendations, the protection provided by the device may be insufficient. Before use, check for any damage or malfunction. If any irregularities are found (e.g., exposed test lead, damaged casing, broken LCD display, etc.) or if the meter is deemed faulty, stop using it.

2. Do not use the meter if the back cover or battery cover is not completely closed — this

may pose a risk of electric shock!

3. During measurements, keep fingers behind the finger guards of the test leads and do not touch exposed wires, terminals, unused inputs, or measured circuits to prevent electric shock.

4. Set the function dial to the appropriate position before taking a measurement.

5. Do not apply voltage above 1000 V between any terminal of the meter and ground — otherwise, electric shock or damage to the meter may occur.

6. Exercise caution when working with voltages above AC 30 V RMS, 42 V peak, or DC 60 V. Such voltages pose a risk of electric shock.

7. Never allow voltage or current to exceed specified limits. If the range of the measured value is unknown, select the largest available range.

8.

Before measuring resistance, diodes, and continuity, disconnect the power supply from the circuit and fully discharge all capacitors to avoid incorrect readings. 9. When the low battery symbol appears on the LCD display, promptly replace the batteries. If the meter will not be used for an extended period, remove the batteries. Do not modify the internal circuitry of the meter — this protects the device from damage and the user from hazards. Do not use or store the meter in high temperature, high humidity, flammable, explosive environments, or strong magnetic fields. Clean the meter's housing with a soft cloth dampened with mild detergent. Do not use abrasive cleaners or solvents! IV. Electrical Symbols The following symbols may appear on the meter's housing or in this manual. Devices secured throughout with double insulation or reinforced insulation Ground (earth). Warning or caution.

Alternating current Direct current Continuity check beeper Diode Capacitance Alternating current or direct current Caution, risk of electric shock Permitted for use near and removal from UNINSULATED, DANGEROUS live wires. Compliance with European Union standards Compliance with UL 61010-1, 61010-2-032, 61010-2-033; certification according to CSA C22.2 No. 61010-1, 61010-2-032, 61010-2-033. CAT III Suitable for testing and measuring circuits connected to the distribution part of the building's low voltage installation. CAT IV Suitable for testing and measuring circuits connected at the source of the building's low voltage installation. V. External Construction 8 1 2 3 10 4 9 5 11 6 7 Clamp jaws 12 7.

Function buttons 2. Hand guard 8. NCV sensor 3. LED indicator 9. FLIGHT button (flashlight) 4. Jaw opening trigger LED flashlight 5. Function dial Battery cover 6. LCD display Input jacks

VI. LCD Display UT205E 8 9 10 1 2 3 4 5 6 7 11 12 13 14 Low battery 8. Relative value 2.

Diode test 9. Continuity test 3. High voltage Unit 4. Auto power off Auto range 5. AC signal

Maximum measurement 6. DC signal Minimum measurement 7. Measurement hold (HOLD) NCV — non-contact voltage detection UT207B 9 10 11 12 13 14 1 2 3 4 5 6 7 8 15 16 17 18 19 Low battery level 2. Inrush current measurement NCV 3. High voltage Low impedance measurement (LoZ) 4. Auto power off Unit 5. Relative value Analog indicator 6. AC signal Auto range 7. DC signal Maximum measurement 8. Data hold (HOLD) Minimum measurement 9. DC current reset Low pass filter measurement (LPF) Diode test UT206B / UT208B 10 11 12 13 14 15 16 1 2 3 4 5 6 7 8 9 17 18 19 20 21 22 Low battery level 2. Continuity test 2. Inrush current measurement 3. NCV 3. High voltage 4. Low impedance measurement (LoZ) 4. Auto power off 5. Unit 5. Relative value 6. Flexible probe range indicator 6. AC signal 7. DC signal 7. Analog indicator 8. Flexible current probe 8. Auto range 9. Data hold Maximum measurement 0. DC current reset Minimum measurement . Diode test 2. Temperature measurement 22. Low pass filter measurement (LPF) NOTE 1 — FLEXIBLE CURRENT PROBE RANGE The analog bar is interpreted as follows: Range Description of segment 30.00 A One segment = 1.00 A 300.0 A One segment = 10.0 A 3000 A One segment = 100 A VII. Function dial and function buttons 1.

Function Dial

Position Description

A~ / A□ AC / DC Current Measurement

V~ / V□ AC / DC Voltage Measurement

Ω Resistance Measurement

▷|← Diode Test

?) Continuity Test

—|— Capacitance Measurement

Hz Frequency Measurement

% Duty Cycle Measurement

°C / °F Temperature Measurement

NCV Non-contact AC Voltage Detection

Measurement with Flexible Current Probe

LPF V~ AC Voltage Measurement with Low Pass Filter

LoZ V~ Low Impedance AC Voltage Measurement

OFF Power Off

2. Function Buttons

Note:

Short press: pressing the button for less than 2 seconds. Long press: pressing the button for

more than 2 seconds.

1) SELECT Button

Short press: switches between functions for each position of the dial. Long press: turns LPF function on/off in voltage mode.

2) HOLD Button

Short press: turns data hold on/off. Long press: turns backlight on/off.

3) MAX/MIN Button

Short press: enters maximum/minimum value measurement mode (in this mode, auto power off function does not work). Long press: exits maximum/minimum value measurement mode. Works only for ACV, LoZ V~, DCV, ACA, DCA, Q, CAP, °C/°F, and measurement with flexible current probe.

4) REL or REL ZERO Button

Short press: enters/exits relative measurement mode. The LCD will display " ". Displayed value = measured value - reference value.

Applies only to ACV, DCV, ACA, Q, and CAP (for CAP, the REL button is used to clear the baseline value). In DCA measurement mode, a short press of the REL ZERO button enters/exits zeroing mode.

5) RANGE Button

Short press: switches to manual range selection mode and changes the range. Long press: long press or rotation of the function dial exits manual range selection mode. Applies only to ACV, LPF ACV, LoZ V~, DCV, ACA, DCA, CAP (only UT205E), and Q.

6) Hz/INRUSH Button

Short press: enters/exits frequency measurement mode. Works only in ACV, LPF ACV, LoZ V~, ACA modes and during measurement with flexible current probe. Long press: the user can first select the appropriate range using the RANGE button or simply long press this button to enter inrush current measurement mode (measurement time ~100 ms). A subsequent long press of this button exits inrush current measurement mode. Inrush current can also be measured using the flexible current probe (UT206B/UT208B).

7) Hz Button (only UT205E)

Short press: enters/exits frequency measurement mode.

8) FLIGHT Button

Short press: turns flashlight on/off.

VIII. Specifications

1. General Specifications

Maximum Indication 6000 readings

Polarity Display automatic

Overload Indicator "OL" or "-OL"

Low Battery Indicator battery symbol on LCD

Sampling Frequency 3 times/s

Sensor Type inductive coil (UT205E / UT206B); Hall sensor (UT207B / UT208B)

Measurement Position Error ± 1.0 % of reading, if the lead is not placed in the center of the jaws

Jaw Width 42 mm

Battery 3 $\times$ 1.5 V AAA

Auto Power Off 15 min (can be disabled)

Dimensions 272 $\times$ 81 $\times$ 43.5 mm

Weight (with batteries) approx. 492 g (UT205E / UT206B); 447 g (UT207B / UT208B)

2. Environmental Parameters

Operating Altitude up to 2000 m above sea level

Safety Standards IEC 61010-1, IEC 61010-2-032, IEC 61010-2-033; CAT III 1000 V, CAT IV 600 V

Pollution Degree 2

Operating Temperature and Humidity 0 °C – 30 °C (≤ 80 % RH)

30 °C – 40 °C (≤ 75 % RH)

40 °C – 50 °C (≤ 45 % RH)

Storage Temperature and Humidity –10 °C – 60 °C (≤ 80 % RH)

EMC Compatibility RF = 1 V/m: total accuracy = specified accuracy + 5 % of range; RF > 1 V/m: unspecified accuracy

3. Electrical Specifications

Accuracy: $\pm$ (a % of reading + b digits), 1-year calibration cycle. Ambient Temperature: 23 °C $\pm$ 5 °C; Humidity: ≤ 80 % RH. To ensure measurement accuracy, the operating temperature should be within the range of 18 – 28 °C, with fluctuations within ± 1 °C. When the temperature is < 18 °C or > 28 °C, add a temperature coefficient error of 0.1 $\times$ (specified accuracy) for each °C.

1) AC CURRENT (ACA)

Range Resolution Accuracy Overload Protection

60.00 A 0.01 A $\pm$ (2.0 % + 5) — UT205E / UT206B 1000 A AC/DC

$\pm$ (2.0 % + 9) — UT207B / UT208B

600.0 A 0.1 A $\pm (2.0 \% + 5)$

1000 A 1 A $\pm (2.0 \% + 5)$

Display: True RMS. Accuracy guarantee: 5 % - 100 % of range. In open circuit, the least significant digit is allowed to be ≤ 10 .

Frequency range: 50 - 60 Hz (UT205E / UT206B); 40 - 400 Hz (UT207B / UT208B). If the measured current exceeds 500 A, the continuous measurement time must not exceed 60 s (UT205E / UT206B). The AC peak factor reaches a value of 3.0 at 3000 readings, while ≤ 1.5 at 6000 readings. For a non-sinusoidal waveform, add: a) 4 % at a factor of 1 - 2; b) 5 % at 2 - 2.5; c) 7 % at 2.5 - 3. Monitoring the current frequency: resolution 0.1 Hz, accuracy $\pm (0.1 \% + 3)$; signal amplitude ≥ 10 % of the range. 2) INRUSH CURRENT (INRUSH) Function Range Res. Accuracy Protection Inrush current (ACA) 60.00 A 0.01 A $\pm (10 \% + 10)$ 1000 A 600.0 A 0.1 A 1000 A 1 A Inrush current 30.00 A 0.01 A $\pm (10 \% + 10)$ 3000 A (flexible current probe) 300.0 A 0.1 A 3000 A 1 A Measurement time: ~ 100 ms. 3) DC CURRENT (DCA) Range Res. Accuracy Protection 60.00 A 0.01 A $\pm (2.0 \% + 5)$ 1000 A 600.0 A 0.1 A 1000 A 1 A Accuracy warranty: 5 % - 100 % of the range. Press REL ZERO to remove the DC offset that may affect measurement accuracy. 4) AC VOLTAGE (ACV) Range Res. Accuracy Protection 6.000 V 0.001 V $\pm (1.2 \% + 3)$ 1000 V 60.00 V 0.01 V 600.0 V 0.1 V $\pm (1.0 \% + 8)$ 1000 V 1 V $\pm (1.0 \% + 8)$ Display: True RMS. Accuracy warranty: 5 % - 100 % of the range. A short circuit allows the least significant digit ≤ 5 . Input impedance: ≥ 10 M Ω . Frequency range: 40 - 400 Hz. AC peak factor: 3.0 at 3000 readings, ≤ 1.5 at 6000. Add: a) 4 % (1 - 2); b) 5 % (2 - 2.5); c) 7 % (2.5 - 3). Monitoring the voltage frequency: res. 0.1 Hz, acc. $\pm (0.1 \% + 3)$, amplitude ≥ 10 % of the range. 5) ACV LPF Range Res. Accuracy Protection 600.0 V 0.1 V $\pm (2.0 \% + 5)$ 1000 V 1000 V 1 V True RMS; input impedance ≥ 10 M Ω . Accuracy warranty: 5 % - 100 % of the range (short circuit ≤ 5). Passband: 40 - 200 Hz; LPF filter -3 dB frequency ≈ 2.5 kHz. Manual range setting only — use RANGE. Peak factor and frequency monitoring — as for ACV. 6) LOZ V~ Range Res. Accuracy Protection 600.0 V 0.1 V $\pm (2.0 \% + 5)$ 1000 V 1000 V 1 V True RMS; input impedance approx. 2 k Ω . Accuracy warranty: 5 % - 100 % of the range (short circuit ≤ 5). Bandwidth: 40 - 400 Hz. AC peak factor and corrections — as in ACV. When the measured voltage exceeds 220 V, the continuous measurement time ≤ 30 s, and the break > 30 s. Frequency monitoring — as in ACV. 7) DC VOLTAGE (DCV) Range Res. Accuracy Protection 600.0 mV 0.1 mV $\pm (0.5 \% + 5)$ 1000 V 6.000 V 0.001 V $\pm (0.8 \% + 3)$ 60.00 V 0.01 V 600.0 V 0.1 V 1000 V 1 V Input impedance: ≥ 10 M Ω . Accuracy warranty: 5 % - 100 % of the range; short circuit ≤ 5 . 8) RESISTANCE (Ω) Range Res. Accuracy Protection 600.0 Ω 0.1 Ω $\pm (1.0 \% + 3)$ 1000 V 6.000 k Ω 0.001 k Ω $\pm$

(1.0 % + 2) 60.00 k Ω 0.01 k Ω 600.0 k Ω 0.1 k Ω 6.000 M Ω 0.001 M Ω 60.00 M Ω 0.01 M Ω $\pm$ (2.0 % + 8) Result = displayed value – resistance of shorted test leads. Open circuit voltage: approx. 1 V. Warranty: 5 % – 100 % of the range. 9) CONTINUITY Range Res. Indication Protection 600.0 Ω 0.1 Ω Open circuit: resistance $\geq$ 70 Ω , no signal. 1000 V Connected: resistance $\leq$ 30 Ω , continuous beep. Open circuit voltage $\approx$ 1 V. Between 30 Ω and 70 Ω , the buzzer may emit a signal. 10) DIODE TEST Range Res. Indication Protection 6.000 V 0.001 V Open circuit voltage approx. 3 V. 1000 V Measurable PN junction: forward voltage drop $\leq$ 3 V. Silicon PN junction: typically 0.5 – 0.8 V. 11) CAPACITANCE Range Res. Accuracy Protection 60.00 nF 0.01 nF $\pm$ (4.0 % + 25) 1000 V 600.0 nF 0.1 nF $\pm$ (4.0 % + 5) 6.000 μ F 0.001 μ F 60.00 μ F 0.01 μ F 600.0 μ F 0.1 μ F 6.000 mF 0.001 mF $\pm$ (10.0 % + 9) 60.00 mF 0.01 mF Result = displayed value – capacitance of the test leads in an open circuit. For capacitance $\leq$ 1 μ F, the "REL" mode is recommended. Accuracy warranty: 5 % – 100 % of the range. 12) TEMPERATURE ($^{\circ}$ C / $^{\circ}$ F) Range Res.

Accuracy Protection -40° C – 300° C 0.1 $^{\circ}$ C $\pm$ (1.0 % + 20) 1000 V

300° C – 1000° C 1 $^{\circ}$ C $\pm$ (1.0 % + 2)

-40° F – 572° F 0.2 $^{\circ}$ F $\pm$ (1.0 % + 40)

573° F – 1832° F 1 $^{\circ}$ F $\pm$ (1.0 % + 4)

Only type K thermocouples are allowed. If the ambient temperature of the meter changes by $\pm 5^{\circ}$ C, accuracy is guaranteed only after 1 hour of cooling. Open circuit indication: "OL". 13)

FREQUENCY / DUTY CYCLE (HZ / %)

Range Resolution Accuracy

10 Hz – 1 MHz 0.01 Hz – 1 kHz $\pm$ (0.1 % + 3)

10.0 % – 90.0 % 0.1 % $\pm$ (2.6 % + 7)

Input signal amplitude — frequency:

- 10 Hz – 100 kHz: 250 mVrms $\leq$ amplitude $\leq$ 20 Vrms
- 100 kHz – 1 MHz: 600 mVrms $\leq$ amplitude $\leq$ 20 Vrms

Duty cycle:

- 10 % – 90 %: square waves 10 Hz – 1 kHz
- 30 % – 70 %: square waves 1 kHz – 10 kHz

For $2 V_{pp} \leq$ amplitude $\leq 20 V_{pp}$. 14) NON-CONTACT AC VOLTAGE DETECTION (NCV)

Range Accuracy Overload protection

To start measuring, bring the NCV sensor (upper tip) close to the conductor. When no voltage is detected, the LCD displays the message "EF". As the detected voltage increases, more "—" signs appear, and the buzzer and flashing LED activate more frequently. IX. User

Manual

1. AC Current Measurement (ACA)

AC CURRENT MEASUREMENT

- Set the function dial to A~, , or
2. Press the trigger to open the jaws of the clamp and completely encircle one conductor (only one conductor can be measured at a time). For best results, place the conductor in the center of the jaws.

AC CURRENT FREQUENCY MEASUREMENT

- When the dial is in the AC position, briefly press Hz or Hz / INRUSH to enter frequency measurement mode.

2. Press again briefly to exit frequency measurement mode. STARTING CURRENT MEASUREMENT (AC)

- Select the appropriate range using the RANGE button or hold Hz / INRUSH to enter starting current measurement mode.
2. Start the device under test and measure the instantaneous starting current.
 3. Press and hold Hz / INRUSH again to exit the mode. Starting current is the highest AC current (True RMS) measured within 100 ms from the moment of startup. NOTE Measurements should be made at a temperature of 0 – 40 °C. Do not release the trigger suddenly — mechanical shock may temporarily change the reading. Place the wire in the center of the jaws; otherwise, an error of ± 1.0 % occurs. At high currents, the jaws may vibrate slightly — this is normal.

2. DC Current Measurement (DCA)

- Set the function dial to or
2. Briefly press SELECT to switch to DC current measurement. If the display does not show zero, briefly press REL ZERO to reset the readings.
 3. Press the trigger to open the jaws and completely encircle one conductor. For best results, place it in the center of the jaws. NOTE Perform measurements at 0 – 40 °C. With a positive reading, the direction of current is from top to bottom (from the panel to the cover). Do not release the trigger suddenly — a shock will cause a temporary change in the reading. To ensure accuracy, place the wire in the center of the jaws (otherwise, an additional error of ± 1.0 % occurs). After measuring DC current (especially large values), the jaws may remain magnetized. Perform an AC current test to eliminate any residual magnetic signal.

3. Measurement with a flexible current probe

AC CURRENT MEASUREMENT

- Set the function dial to or

2. Insert the probe plugs into the sockets

3. The meter will automatically switch to the flexible probe with an extended current range, displayed on the LCD. AC CURRENT FREQUENCY MEASUREMENT

- After connecting the probe, briefly press Hz / INRUSH to enter frequency measurement mode.

2. Briefly pressing Hz / INRUSH will exit the mode. STARTING CURRENT MEASUREMENT

- After connecting the probe, briefly press RANGE to select the appropriate range.

2. Press and hold Hz / INRUSH to enter starting current measurement mode.

3. Start the device under test and measure the instantaneous starting current.

4. Press and hold Hz / INRUSH to exit the mode. Starting current is the highest AC current (True RMS) measured within 100 ms from the moment of startup.

4. AC Voltage and LPF ACV Measurement

AC VOLTAGE MEASUREMENT

- Insert the red test lead into the socket , , or , and the black into the COM socket.

2. Turn the function dial to V~ or

3. If necessary, briefly press SELECT to switch to AC voltage measurement, then connect the test leads in parallel to the device or power source being measured. AC VOLTAGE

FREQUENCY MEASUREMENT

- In the AC voltage position, briefly press Hz or Hz / INRUSH to enter frequency measurement mode.

2. Briefly pressing again will exit the mode. LPF ACV MEASUREMENT

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In the AC voltage position, press and hold SELECT to activate the LPF ACV function. The LPF function allows for the measurement of signals that are combinations of sinusoidal waves — generated among others by inverters and frequency converters. 2. After activating LPF ACV, briefly press Hz / INRUSH to enter frequency measurement mode. 3. A short press of Hz / INRUSH will exit the mode. WARNING Do not apply voltage exceeding 1000 V — although measuring higher voltage is possible, it may damage the meter. Exercise caution to avoid electric shock when measuring high voltage. After completing the measurement, disconnect the test leads from the circuit. When the voltage exceeds 30 V, a high voltage alarm will appear on the LCD. 5. Measurement of direct current voltage (DCV). Insert the red test lead into the socket , or and the black into the COM socket. 2. Rotate the function dial to the position or . 3. If necessary, briefly press SELECT to switch to direct current voltage

measurement, and connect the leads in parallel to the load or power source being measured.

4. Read the voltage value on the display. **WARNING** Do not apply voltage exceeding 1000 V — although measuring higher voltage is possible, it may damage the meter. When measuring in the 600 mV range, use the “REL” mode. Short the test leads and briefly press REL / REL ZERO — the meter will automatically subtract the voltage of the shorted leads. Exercise caution when measuring high voltage. After completing the measurement, disconnect the test leads from the circuit. When the measured voltage exceeds 30 V, a high voltage alarm will appear on the LCD.

6. Measurement of LoZ ACV. Insert the red test lead into the socket or and the black into the COM socket. 2. Rotate the function dial to the LoZ V~ position and connect the leads in parallel to the load or power source being measured.

FREQUENCY MEASUREMENT LOZ ACV. In the LoZ ACV position, briefly press Hz / INRUSH to switch to frequency measurement mode. 2. A short press of Hz / INRUSH will exit the mode. **WARNING** Do not apply voltage exceeding 1000 V. Exercise caution when measuring high voltage. Before using the LoZ function, measure a known voltage to confirm the correct operation of the meter. After applying the LoZ function, wait 3 minutes before the next measurement. LoZ measurement eliminates ghost voltage, providing a more accurate result. When the measured voltage exceeds 30 V, a high voltage alarm will appear on the LCD.

7. Measurement of resistance. Insert the red test lead into the V/Ω/Hz socket, and the black into the COM socket. 2. Rotate the function dial to the Ω position. If necessary, briefly press SELECT to switch to resistance measurement, then connect the test leads in parallel to the terminals of the resistor being measured. **WARNING** If the measured resistor is open or the resistance exceeds the maximum range, the LCD will display “OL”. Before measuring resistance in a live circuit, turn off the power and fully discharge all capacitors. When measuring low resistances, the test leads introduce an error of 0.1 – 0.2 Ω. To obtain an accurate result, use the “REL” mode: short the leads and briefly press REL / REL ZERO. If the short circuit resistance of the leads is not less than 0.5 Ω, check for damage. For resistances above 1 MΩ, stabilization of the reading may take several seconds — this is normal. Exercise caution at voltages > 30 V RMS, 42 V peak, or DC 60 V. After completing the measurement, disconnect the test leads from the circuit.

8. Continuity test. Insert the red test lead into the V/Ω socket, and the black into the COM socket. 2. Rotate the function dial to the position . Briefly press SELECT to switch to continuity test and connect the leads in parallel to the terminals of the load being measured. 3. When the measured resistance $\leq 30 \Omega$ — the circuit is in good conductive condition, the buzzer emits a continuous signal. For resistance $\geq 70 \Omega$ the buzzer is silent. **WARNING** Before measuring continuity in a live circuit, turn off the power and discharge the capacitors. Exercise caution at voltages > AC 30 V RMS, 42 V peak, or DC

60 V. After the measurement, disconnect the leads. 9. Diode test. Insert the red test lead into the V/ Ω socket; black into COM. Polarity: red "+", black "-". 2. Rotate the dial to the Ω / $\triangleright$ position and briefly press SELECT to switch to diode test. 3. Connect the red lead to the anode, black to the cathode. 4. Read the approximate forward voltage on the display. For a silicon PN junction, it is typically 0.5 – 0.8 V. WARNING If the diode is open or its polarity is reversed, the LCD will show "OL". Before measuring diodes in a live circuit, turn off the power and discharge the capacitors. Exercise caution at voltages > AC 30 V RMS, 42 V peak, or DC 60 V. After the measurement, disconnect the leads. 10. Measurement of capacitance. Insert the red test lead into the V/ Ω /CAP socket, and the black into COM. 2.

Rotate the function knob to the position $\dashv$ (or Ω /CAP) and briefly press SELECT to switch to capacitance measurement. Connect the test leads to the terminals of the capacitor being measured in parallel. WARNING If the capacitor is shorted or the capacitance exceeds the maximum range, "OL" will appear on the LCD. The analog indicator is inactive in capacitance measurement mode. For capacitances > 600 μ F, stabilization of the reading may take a moment. Before measuring, fully discharge all capacitors (especially high-voltage ones) to prevent damage to the meter and hazards. After completing the measurement, disconnect the test leads from the circuit. 11. Frequency / Duty Cycle Measurement. Insert the red test lead into the V/ Ω /Hz socket and the black one into COM. 2. Set the function knob to Hz%, then connect the test leads in parallel to the terminals of the signal being measured. 3. Briefly press SELECT to switch the measurement mode to frequency or duty cycle. WARNING Do not apply a voltage greater than 30 Vrms — there is a risk of injury. After completing the measurement, disconnect the test leads from the circuit. 12. Temperature Measurement. Set the function knob to $^{\circ}$ C / $^{\circ}$ F — the LCD will display "OL". After shorting the test leads, the ambient temperature will be displayed. 2. Insert the type K thermocouple into the meter as illustrated. 3. Use the temperature sensor to measure the surface of the object and after a few seconds read the temperature in degrees Celsius. 4. By briefly pressing SELECT, you can switch the unit to degrees Fahrenheit. WARNING The ambient temperature of the meter should be within the range of 18 – 28 $^{\circ}$ C — otherwise, measurement errors may occur, especially in low-temperature environments. Exercise caution with voltages > AC 30 V RMS, 42 V peak, or DC 60 V. After completing the measurement, remove the thermocouple. 13. Non-Contact AC Voltage Detection (NCV). Set the function knob to NCV and bring the NCV sensor close to the wire being tested. 2. If there is AC voltage or an electromagnetic field present, the LCD will display the signal strength — from weak to strong — with symbols "—". The buzzer will emit an intermittent signal, and the LED will light up. When no voltage is

detected, "EF" will appear on the LCD. Bring the NCV sensor (top tip) close to the wire to start detection. As the intensity of the detected voltage increases, more segments "—" will appear on the display, and the buzzer and flashing LED will signal an increase in signal frequency.

14. Automatic Power Off. If no operation is performed with the knob or buttons for 15 minutes, the meter will automatically turn off to save energy. To wake the meter, press any button (except FLIGHT). To disable the auto-off function, press and hold SELECT while in the off state and simultaneously turn on the meter.

15. Guidelines for Using Test Leads.

Measurement in CAT III / CAT IV measurement locations: ensure that the test lead shields are securely fitted. Lack of CAT III / CAT IV shields increases the risk of electric arc.

2. Measurement in CAT II measurement locations: CAT III / CAT IV shields may be removed. This allows for the measurement of recessed wires — e.g., standard wall sockets. Be careful not to lose the shields.

X. Maintenance WARNING Before opening the rear cover of the meter, remove the test leads to avoid electric shock.

1. General Maintenance. Maintenance and servicing should be performed by qualified personnel or designated departments.

2. Clean the meter casing with a soft cloth and mild detergent. Do not use abrasive materials or solvents.

2. Battery Replacement

1 2 3. Turn off the meter and disconnect the test leads from the input jacks.

2. Unscrew the screw and remove the battery cover.

3. Replace the batteries with 3 standard AAA batteries, observing the polarity markings.

4. Replace the battery cover and tighten the screw.

3. Replacement of Test Leads. If the insulation of the test lead is damaged, it must be replaced.

WARNING Test leads used for measurements in the power network must comply with EN 61010-031 and have a CAT III 1000 V, 10 A or higher rating.

Warnings and Safety Information All information regarding operation and usage can be found in the user manual or on the product label. Before using the products, familiarize yourself with its contents and follow the guidelines contained within. Also, review the following information before use:

User Safety

1. Use measuring tools according to their intended purpose. Do not use measuring tools for tasks for which they were not designed to avoid damage or incorrect measurement results.

2. Always ensure that the tool is in good working condition before use.

Damaged tools, such as cracked housings or damaged displays, can lead to incorrect measurements or the risk of accidents.

3. Regularly calibrate measuring tools to ensure their accuracy and reliability of measurements. Incorrectly calibrated devices can lead to erroneous results.

Precautions

1. Use appropriate eye protection, especially when working with measuring tools that may emit radiation.

2. Keep measuring tools away from children and untrained individuals to prevent accidental damage or improper use.

3. Avoid using

measuring tools in extreme temperature, humidity conditions, or in an atmosphere with a high concentration of dust that may affect their accuracy and functionality. 4. When working with measuring tools, exercise caution to avoid damaging delicate measuring elements (e.g., sensors, probes).

Safe Use

1. Always ensure that the measuring tool is properly set up and secured to avoid measurement errors or damage.
2. Use measuring tools only in designated areas that provide adequate stability and minimize the risk of accidents, such as slippery or uneven surfaces.
3. Never take measurements on live components or in conditions that may pose a safety hazard.

Operating Guidelines in Appropriate Conditions

1. Store measuring tools in a dry, cool place, away from moisture and direct sunlight, which may damage the devices or affect their accuracy.
2. When using measuring tools, ensure they are well seated and not exposed to shocks or impacts that may lead to damage.
3. Avoid using measuring tools in areas with extreme conditions, such as heavy vibrations, hot surfaces, dust, or moisture, unless the tool is designed for such use by the manufacturer.

Maintenance Instructions

1. Regularly check the condition of measuring tools, especially measuring elements (e.g., sensors, probes, displays) and batteries.
2. Follow the cleaning instructions provided by the manufacturer. Use appropriate cleaning materials (e.g., soft cloths) to avoid damaging delicate elements.
3. Regularly perform calibration of measuring tools, according to the manufacturer's recommendations, to maintain measurement accuracy.

Safe Disposal

1. Worn or damaged measuring tools should be disposed of in accordance with applicable environmental protection and electronic recycling regulations.
2. Do not throw measuring tools into regular waste containers, as they may contain environmentally harmful components.
3. Contact local authorities or recycling companies for information on proper disposal of worn measuring tools.

Compliance Statement

Products have been designed in accordance with the safety requirements specified in Regulation (EU) 2023/988 on general product safety, ensuring compliance with applicable safety and health standards for users.

Environmental Protection

Worn electronic equipment marked in accordance with the European Union directive must not be placed together with other municipal waste. It is subject to selective collection and recycling at designated points. By ensuring its proper disposal, you prevent potential negative consequences for the natural environment and human health. The system for collecting worn equipment complies with locally applicable environmental protection regulations regarding waste disposal. Detailed information on this can be obtained from the municipal office, waste management facility, or the store where the product was purchased. The product meets the requirements of the so-called New Approach directives of the European Union (EU) concerning issues related to user safety, health protection, and environmental protection, identifying hazards that should be detected

and eliminated. This document is a translation of the original user manual created by the manufacturer. Detailed information about the distributor/manufacturer warranty conditions is available on the website <https://serwis.innpro.pl/gwarancja>. The product should be regularly maintained (cleaned) by the user or through specialized service points at the user's cost and responsibility. In the absence of information about necessary periodic or service maintenance actions in the user manual, the user should regularly, at least once a week, assess the deviation of the physical condition of the product from that of a physically new product.

In the event of detecting or identifying any irregularity, urgent maintenance (cleaning) or service steps must be taken. Failure to perform proper maintenance (cleaning) and to react promptly upon detecting an irregular condition may lead to permanent damage to the product. The warranty does not cover damages resulting from negligence. Importer:

INNPRO Robert Błędowski sp. z o.o. Representative

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Safety precautions

Before charging, check if the device contacts are clean. Never leave the device unattended while in use and charging. Ensure that you can quickly disconnect the device from the power source in an emergency. Never expose the device to high temperatures. Charge the device in a dry and well-ventilated place away from flammable materials, maintaining a minimum distance of 1m from other objects. Never cover the device while charging. Never use the power supply, charging station, cables, etc., without the manufacturer's recommendation and certification. Take care of your property; the device is equipped with cells that are difficult to extinguish, so have a fire blanket on hand.

LI-ION Battery

The device is equipped with a LI-ION (lithium-ion) battery, which, due to its physical and chemical structure, ages over time and with use. The manufacturer specifies the maximum

operating time of the device under laboratory conditions, where optimal working conditions for the device exist, and the battery itself is new and fully charged. Actual operating time may differ from the declared offer and this is not a defect of the device but a feature of the product. To maintain maximum battery life, it is not recommended to discharge it below 3.18V or 15% of total capacity. Lower values, such as 2.5V for the cell, permanently damage it and this is not covered by the warranty. If the battery or the entire device is not used for more than one month, the battery should be charged to 50% and its charge level should be checked periodically every two months. Store the battery and device in a dry place, away from sunlight and negative temperatures.

LI-PO Battery

The device is equipped with a LI-PO (lithium-polymer) battery, which, due to its physical and chemical structure, ages over time and with use. The manufacturer specifies the maximum operating time of the device under laboratory conditions, where optimal working conditions for the device exist, and the battery itself is new and fully charged. Actual operating time may differ from the declared offer and this is not a defect of the device but a feature of the product. To maintain maximum battery life, it is not recommended to discharge it below 3.5V or 5% of total capacity. Lower values, such as 3.2V for the cell, permanently damage it and this is not covered by the warranty. If the battery or the entire device is not used for more than one month, the battery should be charged to 50% and its charge level should be checked periodically every two months. Store the battery and device in a dry place, away from sunlight and negative temperatures.

Product battery specifications

Feature Value

EAN Code 6935750520536

Battery Category General-purpose portable battery

Battery Type Portable alkaline batteries

(manganese zinc) (LR)

Contains Cadmium/Lead (>0.002% Cd, Not
>0.004% Pb)

Net Weight (kg) -

Capacity (mAh) -