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Metrel MD 9272

Metrel MD 9272 Leakage Clamp TRMS Meter with Power Functions User Manual

Model: MD 9272

1. INTRODUCTION

The Metrel MD 9272 is a sophisticated earth leakage clamp meter designed for accurate measurement of TRMS AC leakage current. This instrument is capable of detecting system loops and identifying potential causes for current loss. Its comprehensive measurement capabilities include voltage (AC/DC), frequency, power, harmonics, power factor (PF), total harmonic distortion (THD), and crest factor. The MD 9272 is an essential tool for electricians and engineers requiring detailed electrical analysis.



Figure 1: The Metrel MD 9272 Leakage Clamp Meter in use. This image shows the device being held by a hand, with its clamp jaw around a bundle of electrical wires. The display shows a reading of 27.89 mA, indicating current measurement. The

meter's blue clamp and black body are clearly visible.

2. SAFETY INFORMATION

Before operating the MD 9272, please read and understand all safety instructions. Failure to follow these instructions may result in electric shock, fire, or damage to the instrument.

- Always inspect the instrument and test leads for damage before use. Do not use if damaged.
- Do not apply more than the rated voltage, as marked on the instrument, between terminals or between any terminal and earth ground.
- Use caution when working with voltages above 30 V AC RMS, 42 V AC peak, or 60 V DC. These voltages pose a shock hazard.
- Always disconnect the test leads from the circuit before changing functions or ranges.
- Ensure the battery compartment is securely closed before operation.
- Adhere to local and national safety codes.

3. PRODUCT FEATURES

The MD 9272 offers a range of advanced features for precise electrical measurements:

- **TRMS Measurement:** Provides accurate readings for both sinusoidal and non-sinusoidal signals.
- **Jaw Size:** Features a 28 mm jaw for clamping around conductors.
- **Shielded Jaw:** Allows for reliable measurements even in electrically noisy environments.
- **High Accuracy:** Achieves AC current readings with 0.8% accuracy and 0.01 mA resolution; voltage readings with 0.5% accuracy and 0.01 V resolution.
- **Power Measurement:** Measures various power parameters including active, reactive, apparent power, THD, PF, and phase displacement.
- **Intelligent Loss Analysis:** Utilizes complex algorithms to detect current loss and identify potential causes.
- **Harmonics Measurement:** Measures current or voltage harmonic components up to the 25th harmonic.
- **THD and PF Display:** The LCD displays readings alongside Total Harmonic Distortion (THD) or Power Factor (PF).
- **Peak Value:** Displays the peak value of the waveform or crest factor.
- **MAX/MIN/HOLD Mode:** Allows display of maximum, minimum, or average measured values.

MD 9272 Leakage Clamp TRMS Meter With Power Functions

High accuracy leakage current and power measurements with all-in-one clamp-on meter.



MD 9272 is a unique earth leakage clamp meter. It not just has the ability to accurately read the TRMS AC leakage current of a system, it can also detect losses in the system and suggest possible reasons for the loss. The voltage (AC/DC), frequency, power, harmonic, power factor (PF), total harmonic distortion (THD) and crest factor measurements make this instrument suitable for any electrician and engineer.

MEASURING FUNCTIONS:

- TRMS AC, DC voltage measurement.
- TRMS AC current measurement.
- Frequency measurement.
- Power parameters measurement.

KEY FEATURES:

- **TRMS:** accurate measurements on sinusoidal and non-sinusoidal signals.
- **Jaw size:** 28 mm.
- **Shielded Jaw:** shielded jaw allows the clamp meter to be used in the noisiest environments.
- **Accurate:** readings of AC current with an accuracy of 0.8 % and a base resolution of 0.01 mA and voltage with an accuracy of 0.5 % and a base resolution of 0.01 V.
- **Power:** measures various power parameters (active, reactive, apparent power, THD, PF, phase displacement).
- **Intelligent loss analysis:** complex algorithms detect loss and allow determining possible reasons for current loss.
- **Harmonics:** measures current or voltage harmonic components and a percentage value of a harmonic up to the 19th.
- **THD and PF:** dual display allows readings to be displayed along with Total Harmonic Distortion (THD) or Power Factor (PF).
- **Peak value:** the peak value of the waveform or crest factor can be displayed.
- **MAX/MIN/HOLD mode:** displays maximum, minimum or average measured value.

APPLICATION:

- Load and leakage current measurement.
- System maintenance.
- Power system checking.
- RCD fault finding.
- Process engineering.



Figure 2: Overview of the Metrel MD 9272. This image highlights the high accuracy leakage current and power measurement capabilities. It displays the device itself, along with text detailing its unique features, measuring functions, and applications.

4. SETUP

4.1 Battery Installation

1. Ensure the MD 9272 is powered off.
2. Locate the battery compartment cover on the rear of the instrument.
3. Use a suitable screwdriver to open the battery compartment.
4. Insert two (2) 1.5 V AA type batteries, observing the correct polarity markings.
5. Replace the battery compartment cover and secure it with the screw.

4.2 Initial Checks

Before first use, verify that the instrument and all accessories are free from visible damage. Ensure test leads are properly connected when required for voltage or resistance measurements.

5. OPERATING INSTRUCTIONS

5.1 Powering On/Off

Rotate the central rotary switch from the 'OFF' position to the desired measurement function to power on the device. To power off, rotate the switch back to 'OFF'.

5.2 Function Selection

The rotary switch allows selection of various measurement functions:

- **A (Amperes):** For AC current measurements, including leakage current.
- **V (Volts):** For AC/DC voltage measurements.
- **Ω (Ohms):** For resistance measurements.
- **CAP (Capacitance):** For capacitance measurements.
- **TEMP (Temperature):** For temperature measurements (requires optional probe).
- **NCV (Non-Contact Voltage):** For detecting live voltage without contact.

5.3 Button Functions

Additional buttons provide enhanced functionality:

- **H (Hold):** Freezes the current display reading. Press again to release.
- **F/Hz:** Toggles between frequency and other related measurements.
- **mA:** Selects milliamperere range for precise leakage current measurements.
- **AC/DC:** Toggles between AC and DC measurement modes for voltage and current.

6. MEASUREMENT FUNCTIONS

The MD 9272 is suitable for a variety of applications:

- **Load and Leakage Current Measurement:** Accurately measure both operational load currents and critical leakage currents.
- **System Maintenance:** Ideal for routine checks and preventative maintenance of electrical systems.
- **Power Quality Checking:** Evaluate power parameters to ensure stable and efficient electrical supply.
- **RCD Fault Finding:** Assist in diagnosing faults in Residual Current Devices.
- **Process Engineering:** Useful for monitoring electrical parameters in industrial processes.

7. MAINTENANCE

7.1 Cleaning

Wipe the instrument with a damp cloth and mild detergent. Do not use abrasive cleaners or solvents. Ensure the instrument is dry before storage or use.

7.2 Battery Replacement

Replace batteries when the low battery indicator appears on the display. Refer to Section 4.1 for battery installation instructions. Always use fresh 1.5 V AA type batteries.

7.3 Storage

When not in use for extended periods, remove the batteries to prevent leakage. Store the instrument in a cool, dry place, away from direct sunlight and extreme temperatures.

8. TROUBLESHOOTING

If you encounter issues with your MD 9272, refer to the following common troubleshooting steps:

- **No Display/Power:** Check battery installation and ensure batteries are fresh. Verify the rotary switch is not in the 'OFF' position.
- **Inaccurate Readings:** Ensure proper function selection for the measurement type. Check test lead connections. Verify the jaw is fully closed around a single conductor for current measurements.
- **Display Shows 'OL' (Overload):** The measured value exceeds the selected range. Switch to a higher range if available, or ensure the input is within the instrument's specifications.
- **Intermittent Readings:** Check for loose connections in test leads or dirty terminals. Ensure stable contact with the circuit under test.

For persistent issues, contact Metrel customer support.

9. SPECIFICATIONS

9.1 Technical Specifications

Function	Range	Accuracy
AC current	40.0 mA, 400.0 mA, 4000 mA, 40.0 A, 100.0 A	$\pm(1.0\% \text{ of reading} + 3 \text{ digits})$
AC/DC voltage	40.0 V, 400.0 V, 600.0 V	$\pm(0.5\% \text{ of reading} + 4 \text{ digits})$
THD	0 ... 99.9 %	$\pm(2.0\% \text{ of reading} + 3 \text{ digits})$
Frequency	45.0 - 600.0 Hz	$\pm 0.5\% \pm 1 \text{ digit}$
Crest Factor	1.00 ... 9.99	$\pm(5.0\% \text{ of reading} + 5 \text{ digits})$
Peak value	40.00 ... 100.0 A	$\pm(3.0\% \text{ of reading} + 3 \text{ digits})$
Power Factor (PF)	0.00 ... 1.00	$\pm 5 \text{ digits}$
Phase	$\pm 180.0^\circ \dots +180.0^\circ$	$\pm 10 \text{ digits}$
Power (W, VA, VAR)	0.000 ... 9999	$\pm(1\% \text{ of reading} \pm 30 \text{ digits})$

Function	Range	Accuracy
Power (kW, kVA, kVAr)	10.00 ... 99.99	$\pm(2\%$ of reading ± 30 digits)

9.2 General Data

- **Power supply:** 2 x 1.5 V batteries, type AA
- **Overvoltage category:** CAT II/600 V, CAT IV/300 V
- **Dimensions:** 190 x 60 x 43 mm
- **Weight:** 255 g

9.3 Standard Set Includes

- Current clamp: MD 9272
- Test lead with probe: 2 pcs
- Battery: 2 x 1.5 V, type AA, 2 pcs
- Pouch
- Instruction manual
- Warranty

Technical specifications

Function	Range	Accuracy
AC current	40.00 mA, 400.0 mA, 4000 mA 40.00 A 100.0 A	$\pm(0.8\% \text{ of reading} + 3 \text{ digits})$ $\pm(1.0\% \text{ of reading} + 3 \text{ digits})$ $\pm(1.2\% \text{ of reading} + 3 \text{ digits})$
AC/DC voltage	40.0 V 400.0, 600.0V V	$\pm(0.5\% \text{ of reading} + 4 \text{ digits})$ $\pm(0.5\% \text{ of reading} + 2 \text{ digits})$
THD	0 ... 99.9 % 100 ... 999 %	$\pm(2.0\% \text{ of reading} + 3 \text{ digits})$ $\pm(2.0\% \text{ of reading} + 3 \text{ digits})$
Frequency	45.0 - 500.0 Hz	$\pm 0.5\% \pm 1 \text{ digit}$
Crest Factor	1.00 ... 2.99 3.00 ... 9.99	$\pm(2.0\% \text{ of reading} + 2 \text{ digits})$ $\pm(3.0\% \text{ of reading} + 5 \text{ digits})$
Peak value	40.00 ... 100.0 A 40.00 V ... 600.0 V	$\pm(3.0\% \text{ of reading} + 3 \text{ digits})$ $\pm(3.0\% \text{ of reading} + 3 \text{ digits})$
Power factor (PF)	0.00 ... 1.00	$\pm 5 \text{ digits}$
Phase	-180.0° ... +180.0°	$\pm 10 \text{ digits}$
Power (W,Var,VA)	0.000 ... 9999	$\pm(1\% \text{ of reading} \pm 30 \text{ digits})$
Power (kW,kVar,kVA)	10.00 ... 99.99	$\pm(2\% \text{ of reading} \pm 30 \text{ digits})$
General data		
Power supply	2 x 1.5 V batteries, type AA	
Overvoltage category	CAT III / 600 V, CAT IV / 300 V	
Dimensions	190 x 60 x 43	
Weight	255 g	

Ordering information

Standard set MD 9272



- Current clamp MD 9272
- Test lead with probe, 2 pcs
- 1.5 V battery, type AA, 2 pcs
- Pouch
- Instruction manual
- Warranty



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Note! Photographs in this catalogue may slightly differ from the instruments at the time of delivery. Subject to technical change without notice.

Figure 3: Technical specifications and ordering information for the Metrel MD 9272. This image includes a detailed table outlining various functions, ranges, and accuracies, as well as general data like power supply, dimensions, and weight. The 'Ordering information' section lists the standard set of accessories included with the MD 9272.

10. WARRANTY AND SUPPORT

The Metrel MD 9272 comes with a standard warranty as detailed in the ordering information. For warranty

claims or technical support, please contact Metrel directly.

Manufacturer Contact Information:

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