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Metrel MI 3210 TeraOhm XA 10kV

Metrel MI 3210 TeraOhm XA 10kV Insulation Tester Megohmmeter User Manual

Model: MI 3210 TeraOhm XA 10kV

Introduction

The Metrel MI 3210 TeraOhm XA 10kV is a portable, battery or mains powered test instrument designed for diagnosing insulation resistance using high DC test voltages up to 10 kV. Its robust design, including CAT IV protection and high immunity to radiated RF fields, makes it suitable for industrial environments. This manual provides essential information for the safe and effective use of your MI 3210 TeraOhm XA 10kV instrument.

Figure 1: Metrel MI 3210 TeraOhm XA 10kV Insulation Tester.

Setup

Unpacking and Contents Check

Carefully unpack the instrument and verify that all components listed below are present and undamaged. If any items are missing or damaged, contact your supplier immediately.

- Instrument MI 3210 TeraOhmXA 10 kV
- 10 kV shielded test lead with probe, 2 m
- Large HV Crocodile with cable, red, 2.5 m
- Large HV Crocodile with shielded cable, black, 2.5 m
- Guard test lead, green, 2.5 m
- Crocodile clip, green
- Mains cable
- PC SW HVLink PRO with USB and RS 232 cable
- Handbook “Guide to modern insulation testing” on CD
- Instruction manual on CD
- Calibration certificate

Figure 2: MI 3210 TeraOhm XA 10kV with standard accessories.

Power Supply

The MI 3210 can be powered by mains electricity or its internal rechargeable battery. Ensure the instrument is fully charged before initial use for optimal performance. Connect the provided mains cable to the instrument and a suitable power outlet for charging or direct operation.

Initial Connections

Before performing any measurements, ensure all test leads are securely connected to the appropriate terminals on the instrument and the object under test. Refer to the diagram below for terminal identification.

Figure 3: Top panel of the MI 3210 showing connection ports.

Important: Always disconnect all test leads and switch off the instrument before removing the top cover or performing any internal maintenance.

Operating Instructions

Measurement Functions

The MI 3210 TeraOhm XA 10kV offers a comprehensive suite of measurement functions:

- **Insulation Measurement:** Measures insulation resistance up to 20 TΩ. Test voltage is adjustable from 50 V to 10 kV in 50 V and 100 V steps.
- **Diagnostic Tests:** Includes Polarization Index (PI), Dielectric Absorption Ratio (DAR), and Dielectric Discharge (DD) tests.
- **Step Voltage Test:** Performs insulation resistance measurements at multiple voltage steps.
- **Withstanding Voltage Test (DC):** Conducts DC voltage tests up to 10 kV.
- **Voltage and Frequency Measurement:** Measures AC/DC voltage up to 550 V TRMS.
- **Capacitance Measurement:** Determines the capacitance of the tested object.

The instrument features a programmable timer for timed measurements and an automatic discharge function for the test object after measurement completion, ensuring safety.

Data Management and Communication

The MI 3210 stores measurement results in both numerical and graphical forms. For advanced analysis and report generation, use the included PC software HVLink PRO. The instrument supports isolated RS232 and USB communication ports, as well as a Bluetooth (BT) interface for data transfer.

Figure 4: Instrument display and control interface.

Maintenance

General Care and Cleaning

To ensure the longevity and accuracy of your MI 3210, keep it clean and free from dust and moisture. Use a soft, dry cloth for cleaning the exterior. Do not use abrasive cleaners or solvents. Store the instrument in its protective case when not in use.

Battery Maintenance

The instrument is powered by a rechargeable battery. For optimal battery life, avoid deep discharges and recharge the battery regularly. If the instrument will not be used for an extended period, charge the battery to approximately 50% before storage and recharge every few months.

Calibration

Regular calibration is essential to maintain the accuracy of the MI 3210. Refer to the calibration certificate provided with your instrument for recommended calibration intervals. Contact an authorized service center for calibration services.

Troubleshooting

This section provides solutions to common issues you might encounter with your MI 3210 TeraOhm XA 10kV. For problems not listed here, or if solutions do not resolve the issue, contact Metrel technical support.

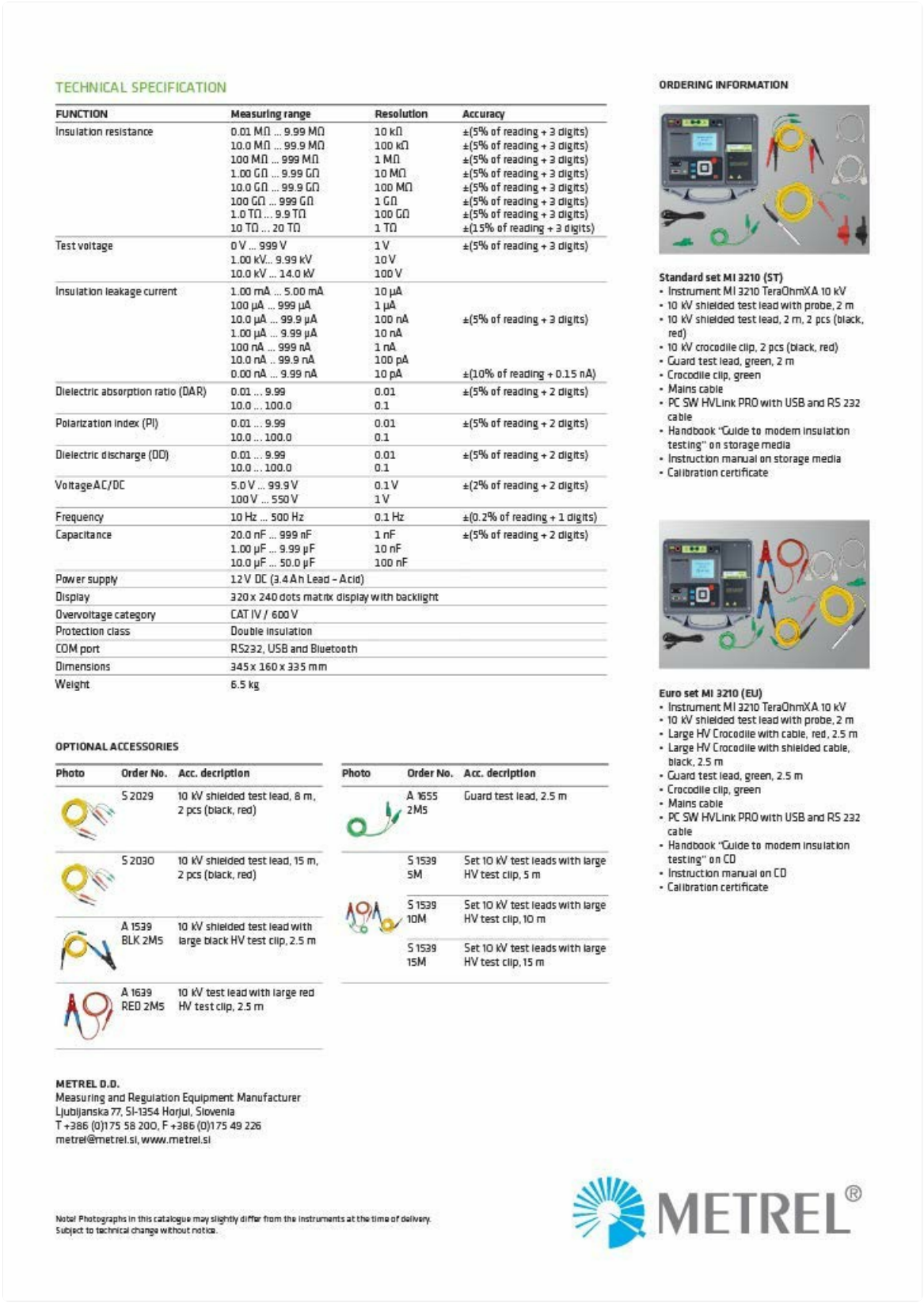
Problem	Possible Cause	Solution
Instrument does not power on.	Low battery or no mains power.	Connect to mains power and allow battery to charge. Check mains cable connection.
Inaccurate measurement readings.	Poor test lead connection, high EM interference, or instrument out of calibration.	Ensure all test leads are securely connected. Move away from strong electromagnetic fields. Consider professional calibration.
High voltage breakdown detected.	Fault in the object under test or improper connection.	Verify the integrity of the object under test. Recheck all connections and ensure proper insulation.

Problem	Possible Cause	Solution
Data transfer issues with PC.	Incorrect cable, driver issues, or software configuration.	Ensure correct USB/RS232 cable is used. Install necessary drivers. Check HVLink PRO software settings.

Specifications

Below are the key technical specifications for the Metrel MI 3210 TeraOhm XA 10kV Insulation Tester.

Parameter	Value
Insulation Resistance Range	Up to 20 TΩ
Test Voltage	50 V to 10 kV (adjustable in 50 V / 100 V steps)
Min. Operating Voltage	50 Volts (DC)
Voltage Measurement	Up to 550 V TRMS
Power Source	Mains and Rechargeable Battery
Communication Ports	Isolated RS232, USB, Bluetooth (BT)
Safety Standard	IEC 61010-1:2000-1, CAT IV / 600 V
Dimensions	345 x 160 x 325 mm (approximate, based on image)
Weight	8.5 kg (approximate, based on image)



TECHNICAL SPECIFICATION

FUNCTION	Measuring range	Resolution	Accuracy
Insulation resistance	0.01 MΩ ... 9.99 MΩ 10.0 MΩ ... 99.9 MΩ 100 MΩ ... 999 MΩ 1.00 GΩ ... 9.99 GΩ 10.0 GΩ ... 99.9 GΩ 100 GΩ ... 999 GΩ 1.0 TΩ ... 9.9 TΩ 10 TΩ ... 20 TΩ	10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ 100 GΩ 1 TΩ	±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(5% of reading + 3 digits) ±(15% of reading + 3 digits)
Test voltage	0 V ... 999 V 1.00 kV... 9.99 kV 10.0 kV ... 14.0 kV	1 V 10 V 100 V	±(5% of reading + 3 digits)
Insulation leakage current	1.00 mA ... 5.00 mA 100 µA ... 999 µA 10.0 µA ... 99.9 µA 1.00 µA ... 9.99 µA 100 nA ... 999 nA 10.0 nA ... 99.9 nA 0.00 nA ... 9.99 nA	10 µA 1 µA 100 nA 10 nA 1 nA 100 pA 10 pA	±(5% of reading + 3 digits) ±(10% of reading + 0.15 nA)
Dielectric absorption ratio (DAR)	0.01 ... 9.99 10.0 ... 100.0	0.01 0.1	±(5% of reading + 2 digits)
Polarization index (PI)	0.01 ... 9.99 10.0 ... 100.0	0.01 0.1	±(5% of reading + 2 digits)
Dielectric discharge (DD)	0.01 ... 9.99 10.0 ... 100.0	0.01 0.1	±(5% of reading + 2 digits)
Voltage AC/DC	5.0 V ... 99.9 V 100 V ... 550 V	0.1 V 1 V	±(2% of reading + 2 digits)
Frequency	10 Hz ... 500 Hz	0.1 Hz	±(0.2% of reading + 1 digits)
Capacitance	20.0 nF ... 999 nF 1.00 µF ... 9.99 µF 10.0 µF ... 50.0 µF	1 nF 10 nF 100 nF	±(5% of reading + 2 digits)
Power supply	12 V DC (3.4 Ah Lead – Acid)		
Display	320 x 240 dots matrix display with backlight		
Overvoltage category	CAT IV / 600 V		
Protection class	Double insulation		
COM port	RS232, USB and Bluetooth		
Dimensions	345 x 160 x 335 mm		
Weight	6.5 kg		

ORDERING INFORMATION

Standard set MI 3210 (ST)
- Instrument MI 3210 TeraOhmXA 10 kV
- 10 kV shielded test lead with probe, 2 m
- 10 kV shielded test lead, 2 m, 2 pcs (black, red)
- 10 kV crocodile clip, 2 pcs (black, red)
- Guard test lead, green, 2 m
- Crocodile clip, green
- Mains cable
- PC SW HVLink PRO with USB and RS 232 cable
- Handbook "Guide to modern insulation testing" on storage media
- Instruction manual on storage media
- Calibration certificate

Euro set MI 3210 (EU)
- Instrument MI 3210 TeraOhmXA 10 kV
- 10 kV shielded test lead with probe, 2 m
- Large HV Crocodile with cable, red, 2.5 m
- Large HV Crocodile with shielded cable, black, 2.5 m
- Guard test lead, green, 2.5 m
- Crocodile clip, green
- Mains cable
- PC SW HVLink PRO with USB and RS 232 cable
- Handbook "Guide to modern insulation testing" on CD
- Instruction manual on CD
- Calibration certificate

OPTIONAL ACCESSORIES

Photo	Order No.	Acc. decription
	S 2029	10 kV shielded test lead, 8 m, 2 pcs (black, red)
	S 2030	10 kV shielded test lead, 15 m, 2 pcs (black, red)
	A 1539 BLK 2M5	10 kV shielded test lead with large black HV test clip, 2.5 m
	A 1639 RED 2M5	10 kV test lead with large red HV test clip, 2.5 m

Photo	Order No.	Acc. decription
	A 1655 2M5	Guard test lead, 2.5 m
	S 1539 5M	Set 10 kV test leads with large HV test clip, 5 m
	S 1539 10M	Set 10 kV test leads with large HV test clip, 10 m
	S 1539 15M	Set 10 kV test leads with large HV test clip, 15 m

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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.

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Figure 5: Excerpt from the technical specification sheet.

Warranty and Support

Warranty Information

The Metrel MI 3210 TeraOhm XA 10kV comes with a two-year warranty from the manufacturer. This warranty covers defects in materials and workmanship under normal use. Please retain your proof of purchase for warranty claims.

Technical Support

For technical assistance, troubleshooting, or service inquiries, please contact Metrel customer support or your authorized distributor. Refer to the contact information provided in the original product packaging or on the official Metrel website.
You can find more information and support resources atwww.metrel.si.

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