Metrel MI 3280 DT

Metrel MI 3280 DT Digital Transformer Analyzer User Manual

Model: MI 3280 DT

1. Introduction

The Metrel MI 3280 Digital Transformer Analyzer is a portable, battery-powered test instrument designed for comprehensive diagnosis of single and three-phase transformers. It performs measurements of turn ratio, phase deviation, excitation current, and winding resistance. Its robust design with IP65 (case closed) and IP54 (case open) protection ensures reliable operation in various environments.

This manual provides essential information for the proper setup, operation, and maintenance of your MI 3280 DT instrument.



Figure 1: The MI 3280 DT Digital Transformer Analyzer in its protective case.

This image shows the Metrel MI 3280 DT Digital Transformer Analyzer, a grey and black device with a color touch screen, housed within its

open, rugged grey and blue protective case. The case features robust latches and a handle, indicating its portability and durability for field use.

2. Package Contents

Upon unpacking, verify that all items listed below are present and undamaged:

- Instrument MI 3280
- 4-wire test lead with Kelvin clips, 2.5 m (4 pieces)
- USB cable
- Mains cable
- Soft carrying bag for accessories
- Metrel ES Manager BASIC Software
- Instruction manual (this document)
- Calibration certificate



Figure 2: Standard set of the MI 3280 DT with accessories.

This image displays the Metrel MI 3280 DT unit alongside its complete set of accessories. These include multiple sets of color-coded test leads with Kelvin clips, a USB cable, a mains power cable, and a blue soft carrying bag, all essential for the instrument's operation and transport.

3. Setup and Initial Use

3.1 Charging the Battery

The MI 3280 DT is equipped with a built-in charger and rechargeable Li-ion batteries. Before first use, fully charge the instrument by connecting the supplied mains cable to the instrument's power input and a suitable power outlet. The charging indicator on the device will provide status.

3.2 Connecting Test Leads

Proper connection of test leads is crucial for accurate measurements and safety. Refer to the connection diagrams provided in the instrument's on-screen help or the detailed technical documentation for specific test configurations.



Figure 3: MI 3280 DT Control Panel and Connection Ports.

This image provides a detailed view of the MI 3280 DT's control panel. It highlights the 4.3-inch color touch screen, navigation buttons, and various input/output ports for connecting test leads, including clearly labeled H (High Voltage) and X (Low Voltage) terminals, and a USB port for PC communication.

3.3 Software Installation (Metrel ES Manager BASIC)

The Metrel ES Manager BASIC software is provided for PC communication, test structure creation, data transfer, and report generation. Install the software from the supplied media or download the latest version from the Metrel website. Connect the instrument to your PC using the USB cable for data transfer.

4. Operating the Instrument

4.1 User Interface Overview

The MI 3280 DT features a 4.3-inch high-resolution color touch screen for intuitive navigation. The main menu provides access to various functions including single tests, memory organizer, auto sequences, and general settings.



Figure 4: Main Menu Interface of the MI 3280 DT.

This image shows a close-up of the MI 3280 DT's color touch screen displaying the main menu. Options such as "Single Tests," "Memory Organizer," "Auto Sequences," and "General Settings" are visible, indicating the instrument's user-friendly interface for various testing functions.

4.2 Measurement Functions

The MI 3280 DT performs the following key measurements:

- **Turn Ratio Measurement:** For single and three-phase transformers.
- **Phase Deviation:** Measures deviation between high voltage and low voltage windings.
- **Excitation Current:** Measures the current required to magnetize the transformer core.
- **Winding Resistance Measurement:** For single and three-phase transformers (up to 1.6 MVA power transformers).

Detailed instructions for each measurement type, including connection diagrams and test parameters, are available within the instrument's built-in help screens.

4.3 Auto Sequences

For advanced users, the instrument offers pre-programmed auto sequences to streamline common testing procedures.

These sequences guide the user through a series of measurements, ensuring consistency and efficiency.

4.4 Data Storage and Transfer

Test results can be stored directly on the instrument's internal memory. For analysis, reporting, or long-term archiving, transfer the stored data to a PC using the Metrel ES Manager software via USB or Bluetooth communication.

5. Maintenance and Care

5.1 Cleaning

Clean the instrument's exterior with a soft, damp cloth. Do not use abrasive cleaners or solvents. Ensure the instrument is powered off and disconnected from all test leads and power sources before cleaning.

5.2 Storage

When not in use, store the MI 3280 DT in its protective case in a dry, cool environment, away from direct sunlight and extreme temperatures. Ensure the case is closed to maintain its IP65 protection rating.

5.3 Calibration

To ensure continued accuracy and reliability, regular calibration by an authorized service center is recommended. Refer to the calibration certificate for the recommended calibration interval.

6. Troubleshooting

This section provides solutions to common issues. For problems not listed here, contact Metrel technical support.

Problem	Possible Cause	Solution
Instrument does not power on.	Battery discharged; Power cable not connected properly.	Charge the battery; Check power cable connection.
Inaccurate measurement readings.	Incorrect test lead connection; Instrument out of calibration; Environmental interference.	Verify lead connections; Arrange for calibration; Minimize external interference.
Cannot connect to PC via USB/Bluetooth.	Driver issues; Bluetooth not enabled; Incorrect software settings.	Reinstall Metrel ES Manager software and drivers; Ensure Bluetooth is active on both devices; Check software connection settings.

7. Technical Specifications

Key technical specifications for the Metrel MI 3280 DT Digital Transformer Analyzer:

- **Model:** MI 3280 DT
- **Power Source:** Battery Powered (Li-ion)
- **Display:** 4.3" TFT High Resolution Colour Touch Screen
- **Protection Degree:** IP65 (case closed), IP54 (case open)
- **Communication:** USB, Bluetooth (BT)
- **Measurement Functions:** Turn Ratio, Phase Deviation, Excitation Current, Winding Resistance
- **Winding Resistance Range:** Up to 1.6 MVA Power Transformers

- **Software:** Metrel ES Manager BASIC
- **Dimensions:** (Refer to detailed technical sheet for exact dimensions)
- **Weight:** (Refer to detailed technical sheet for exact weight)

TECHNICAL SPECIFICATION

Function		Measuring range	Resolution	Accuracy
TURN RATIO r, rA, rB, rC	Excitation voltage 80 V	0.8000 ... 9.9999	0.0001	±(0.2% of reading + 2 digits)
		10.000 ... 99.999	0.001	±(0.2% of reading + 2 digits)
		100.00 ... 999.99	0.01	±(0.2% of reading + 2 digits)
		1000.0 ... 1999.9	0.1	±(0.5% of reading + 2 digits)
		2000.0 ... 3999.9	0.1	±(0.5% of reading + 2 digits)
		4000.0 ... 8000.0	0.1	±(1.0% of reading + 2 digits)
	Excitation voltage 40 V	0.8000 ... 9.9999	0.0001	±(0.2% of reading + 2 digits)
		10.000 ... 99.999	0.001	±(0.2% of reading + 2 digits)
		100.00 ... 999.99	0.01	±(0.2% of reading + 2 digits)
		1000.0 ... 1999.9	0.01	±(0.5% of reading + 2 digits)
		2000.0 ... 3999.9	0.1	±(0.5% of reading + 2 digits)
		4000.0 ... 8000.0	0.1	n/a
	Excitation voltage 10 V	0.8000 ... 9.9999	0.0001	±(0.2% of reading + 2 digits)
		10.000 ... 99.999	0.001	±(0.2% of reading + 2 digits)
		100.00 ... 999.99	0.01	±(0.5% of reading + 2 digits)
		1000.0 ... 8000.0	0.1	n/a
	Excitation voltage 5 V	0.8000 ... 9.9999	0.0001	±(0.2% of reading + 2 digits)
		10.000 ... 99.999	0.001	±(0.2% of reading + 2 digits)
		100.00 ... 999.99	0.01	±(0.5% of reading + 2 digits)
		1000.0 ... 8000.0	0.1	n/a
	Excitation voltage 1 V	0.8000 ... 9.9999	0.0001	±(0.2% of reading + 2 digits)
		10.000 ... 99.999	0.001	±(0.5% of reading + 2 digits)
		100.00 ... 999.99	0.01	n/a
		1000.0 ... 8000.0	0.1	n/a
EXCITATION CURRENT i, iA, iB, iC	Test frequency 55, 65 or 70 Hz	0.10 mA ... 9.99 mA	0.01 mA	±(2 % of reading + 0.20 mA)
		10.0 mA ... 99.9 mA	0.1 mA	±(2 % of reading + 2 digits)
		100 mA ... 999 mA	1 mA	±(2 % of reading + 2 digits)
		1.00 A ... 1.10 A	0.01 A	±(2 % of reading + 2 digits)
PHASE DEVIATION fi, jA, jB, jC	Test frequency 55, 65 or 70 Hz	-180.00 ... 180.00 °	0.01°	±(0.05°)
WINDING RESISTANCE R, RA, RB, RC	Test current 10 mA ... 1000 mA	1.0 mΩ ... 999.0 mΩ	0.1 mΩ	±(2 % of reading + 3 digits)
		1.000 Ω ... 9.999 Ω	0.001 Ω	±(2 % of reading + 2 digits)
		10.00 Ω ... 99.99 Ω	0.01 Ω	±(2 % of reading + 2 digits)
		100.0 Ω ... 999.9 Ω	0.1 Ω	±(2 % of reading + 2 digits)
GENERAL	Battery power supply	14.4 V DC (4.4Ah Li-ion)		
	Battery charging time	typical 4.5 h (deep discharge)		
	Mains power supply	90-260 VAC, 45-65 Hz, 100 VA (300 V CAT II)		
	Protection classification	reinforced insulation		
	Measuring category	50 V CAT IV		
	Pollution degree	2		
	Degree of protection	IP 65 (case closed), IP 54 (case open)		
	Dimensions (w x h x d)	360 x 160 x 330 mm		
	Weight	8.8 kg, (with battery and accessories)		

ORDERING INFORMATION



- Instrument MI 3280
- 4 wire test lead with Kelvin clips, 2.5 m 4 pcs
- USB cable
- Mains cable
- Soft carrying bag
- Metrel ES Manager BASIC license*
- Instruction manual
- Calibration certificate

*Metrel ES Manager can be downloaded free of charge from Metrel Web server.

OPTIONAL ACCESSORIES

Photo	Order No.	Acc. decription
	A 1615 2M5	Kelvin test lead H0-H1, 2.5 m
	A 1615 5M	Kelvin test lead H0-H1, 5 m
	A 1618 2M5	Kelvin test lead X2-X3, 2.5 m
	A 1618 5M	Kelvin test lead X2-X3, 5 m
	A 1616 2M5	Kelvin test lead H2-H3, 2.5 m
	A 1616 5M	Kelvin test lead H2-H3, 5 m
	A 1617 2M5	Kelvin test lead X0-X1, 2.5 m
	A 1617 5M	Kelvin test lead X0-X1, 5 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: Detailed Technical Specifications.

This image displays a page from the product brochure detailing the technical specifications of the MI 3280 DT. It includes precise measurement ranges, resolutions, and accuracies for functions like excitation voltage, turn ratio, excitation current, phase deviation, and

winding resistance, along with general specifications like power supply, protection degree, and dimensions.

8. Warranty and Support

8.1 Warranty Information

The Metrel MI 3280 DT Digital Transformer Analyzer comes with a**2-year (24-month) warranty** from the manufacturer. This warranty covers defects in materials and workmanship under normal use. Please retain your proof of purchase for warranty claims.

8.2 Technical Support

For technical assistance, service, or warranty inquiries, please contact Metrel customer support. Contact information can typically be found on the Metrel official website or on the product packaging.
For more information, visit the official Metrel website:www.metrel.si

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Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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