

Demonstration boards

MI 3298 Power Network Application Trainer set modules

AD1 MI 3298 – EARTH/TRANSFORMER/ INSULATION RESISTANCE TRAINER

Module includes the following equipment:

- MI 3298 P1 Earth/Ground trainer module, 2 pcs
- MI 3298 T Transformer/Insulation resistance trainer module
- MI 3295 Step Contact Voltage Measuring System
- MI 3205 TeraOhmXA 5kV
- MI 3280 Digital Transformer Analyser
- MI 3250 MicroOhm 10A
- MI 3290 GX 1 Earth Analyser



AD3 MI 3298 – EARTH TRAINER

Module includes the following equipment:

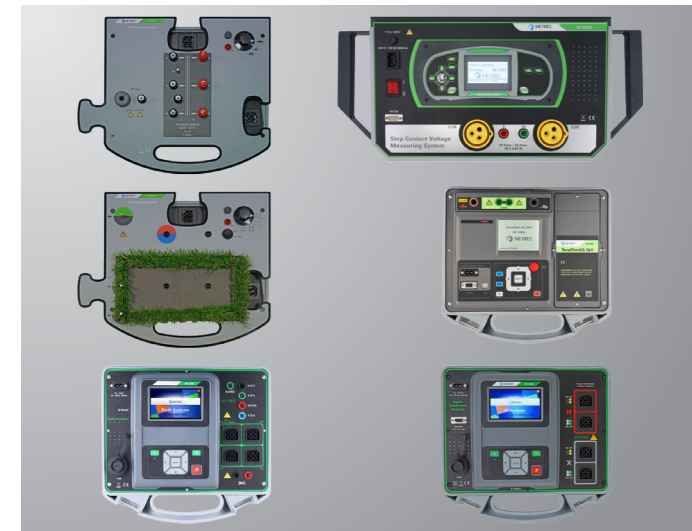
- MI 3298 P1 Earth/Ground trainer module
- MI 3295 Step Contact Voltage Measuring System
- MI 3290 GX 1 Earth Analyser



AD2 MI 3298 – EARTH/TRANSFORMER/ INSULATION RESISTANCE TRAINER

Module includes the following equipment:

- MI 3298 P1 Earth/Ground trainer module
- MI 3298 T Transformer/Insulation trainer module
- MI 3295 Step Contact Voltage Measuring System
- MI 3205 TeraOhmXA 5kV
- MI 3280 Digital Transformer Analyser
- MI 3290 GX 1 Earth Analyser



AD4 MI 3298 – TRANSFORMER/ INSULATION RESISTANCE TRAINER

Module includes the following equipment:

- MI 3298 T Transformer/Insulation trainer module
- MI 3205 TeraOhmXA5 kV
- MI 3280 Digital Transformer Analyser



METREL d.d.
Measuring and Regulation Equipment Manufacturer
Ljubljanska 77, SI-1354 Horjul, Slovenia
T +386 (0)1 75 58 200, F +386 (0)1 75 49 226
metrel@metrel.si, www.metrel.si



Demonstration
boards
MI 3298
Power Network
Application
Trainer

Demonstration boards

MI 3298 Power Network Application Trainer

The MI 3298 Power Network Application Trainer (MI 3298 P1 and MI 3298 T) based on "puzzle" concept for simulation and training of different measurement situations on the high voltage field. It could be used as stand-alone training module or any numbers of training modules connected together. Training modules are designed for demonstrations, trainings and educational purposes.

The "puzzle" concept is ideally suited for training and education of larger groups of people as well as for independent practice. Due to various integrated electrical elements the module enables complete testing, troubleshooting and practice on earth, insulation measurements as well as power transformer measurements.



KEY FEATURES

- Ground network impedance
- Earth surface potentials
- Fault simulated step & contact voltage
- Pylon Selective legs
- HF earth impedance
- Cable impedance, resistance and insulation
- HV insulation analysis
- Transformer resistance
- Winding resistance measurements
- Transformer turn ration analysis

Different modules can be evaluated separately as an independent system and / or connected together to demonstrate the interconnectivity problems and influences between them.

This approach could give trained personnel clear information about testing methods, measured values and results on known systems and an overview of situations where systems become more complex when connected together.

APPLICATION

- Trainings and seminars for gaining theoretical knowledge and demonstrating/performing practical exercises
- Conducting exams when upgrading the examined professional's competence level
- Education and practical training of electrical contractors about safety procedures, measuring methods and general knowledge
- Demonstration on how to use different measurement instruments and testers

STANDARDS

Safety:

- IEC 61010-1:2010

Functionality

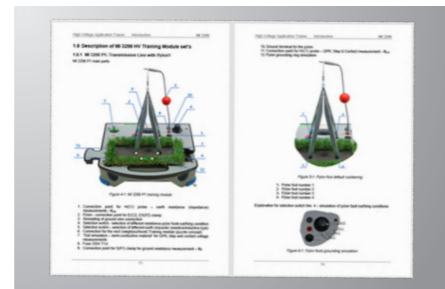
- IEC 61557-5
- IEEE Std 81-2012

MODULES

- **Earth/ground network impedance analysis**
- **Power generator, transformer and coils**
- **Insulating material analysis**

All modules are supported with handbooks, posters, charts, presentations, exercises, catalogue of knowledge and catalogue of exams. Approved certificates may be issued when localizing modules to meet the required country's regulation.

Both training modules offer simple error simulation, thus enabling trainees to practice troubleshooting procedures.



Demonstration boards

MI 3298 P1 Earth/Ground trainer module

MI 3298 P1 Earth/Ground trainer module is designed as a stand-alone module for training different earth measuring methods. Due to the puzzle concept, other MI 3298 P1 Earth/Ground trainer modules and/or MI 3298 T Transformer/Insulation trainer modules can be joined together to simulate a complete transmission line with a switchyard at the end. The module also offers simulation of different errors and object states through the use of a selectable switch and ground wire.



TRAINING MODULE INCLUDES

- MI 3298 P1 Earth/Ground trainer module, code 20 919 237
- Step voltage probe, code 20 052 009, 2 pcs
- Pylon, code 20 052 006
- Ground wire connection, code 20 692 042
- Puzzle interconnection part, code 20 052 010
- Set of measuring cables
- Flex current clamps A 1612 (fi 14 cm), code 20 051 222
- Optional: Flex current clamps A 1612 (fi 14 cm), code 20 051 222, 3 pcs

KEY FEATURES

- Ground networks impedance
- Earth surface potentials
- Fault simulated step & contact voltage
- Pylon (selective legs)
- HF earth impedance

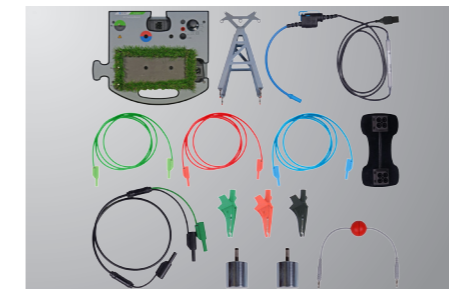


Different measuring procedures and methods can be demonstrated/trained on the MI 3298 P1 Earth/Ground trainer module:

- 3-pole measuring method
- 4-pole measuring method
- S-flex measuring method by using one or more flex clamps
- HF measuring method
- Impulse measuring method
- GPR measurement
- Step and contact voltage measurement
- Pylon ground wire (PCW) test

Different measuring procedures can be demonstrated/trained under various simulated errors and types of objects:

- Simulation of broken connection pylon foot resistance
- Pylon grounding ring simulation for GPR measurements
- Simulation of a ground wire connection
- Simulation of different earthing types



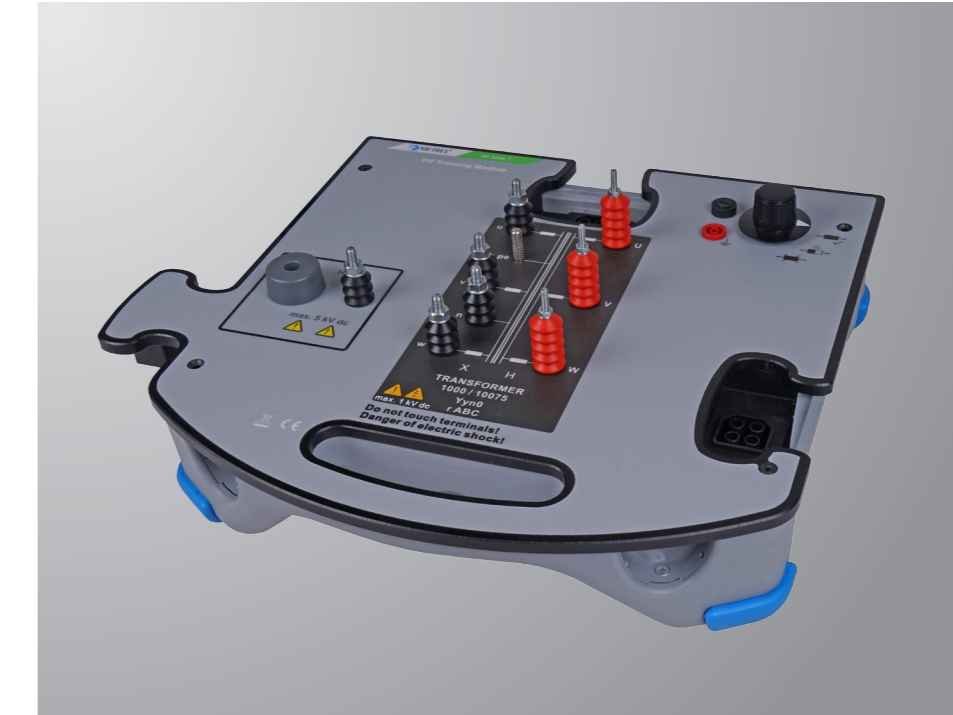
Demonstration boards

MI 3298 T Transformer/Insulation trainer module

The MI 3298 T Transformer/Insulation trainer module is designed as a stand-alone module for training of different insulation measuring methods as well as basic measuring procedures on voltage transformers. Due to the puzzle concept, other MI 3298 P1 Earth/Ground trainer modules and/or MI 3298 T Transformer/Insulation trainer modules can be joined together to simulate a complete transmission line with a switchyard at the end. It is possible to simulate different types of errors on the transformer.

KEY FEATURES

- Cable impedance, resistance and insulation
- HV insulation resistance
- Transformer impedance measurement
- Winding resistance measurement
- Transformer turn ration analysis



TRAINING MODULE INCLUDES

- MI 3298 T Transformer/Insulation trainer module, code 20 919 238
- Puzzle interconnection part, code 20 052 010

Different measuring procedures and methods can be demonstrated/trained on the MI 3298 T Transformer/Insulation trainer module:

- Insulation measurements:
- Insulation resistance test (spot test)
 - Diagnostic tests (DAR, PI, DD)
 - Step voltage test

- Transformer analysis:
- Transformer turn ratio measurement
 - Winding resistance measurement

Different measuring procedures can be demonstrated/trained under various simulated errors:

- Broken windings
- Short-circuit faults on windings

