MV1434-1 Distance Protection Trainer

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This unit is intended for advanced training in modern line distance protection technology. The Distance Protection Trainer is equipped with the fully IEC61850 compliant ABB line distance protection REL650 which is one of the most modern and sophisticated protection units in the product family of IEDs (Intelligent Electronic Devices). The use of an highly advanced IED enables great possibilities to perform a wide range of laboratory experiments.

The unit is equipped with a large graphical HMI (Human Machine Interface) with a single line diagram. Control, monitoring and parameter setting can be performed either from the HMI or from a PC by means of the standardized ethernet interface.

General features

- Power bus Circuit Breaker Control and trip supervision/disconnection
- Control, monitoring and protection integrated in one IED (Intelligent Electronic Device)
- Fully IEC 61850 Compliant
- Four independent parameter setting groups
- Large HMI with single line diagram
- Ethernet interface for fast and easy communication with PC
- Protection and Control IED Manager PCM600: Advanced software for configuration and parameter setting

Most important protection functions

- 5 Zone full-scheme high-speed line distance protection, quadrilateral
- Instantaneous phase- and residual over-current protection
- Four-step phase- and residual directional over-current protection with definite and inverse time characteristics
- Directional residual over-current protection with scheme communication logic
- Two step phase- and residual over-voltage protection with definite and inverse time characteristics
- Two step phase- and residual under-voltage protection with definite and inverse time characteristics

Monitoring

- Disturbance recorder
- Disturbance report
- Event and trip value recorders
- Fault locator

Monitoring (LEDs)

15 pre-configured LED indications for:

- Trip impedance protection Zone 1-5 (five LEDs)
- Start trip phase 1-3 (three LEDs)
- Start trip neutral line
- Over Current trip phase-phase
- Over Current trip phase-neutral
- Start Over Current protection
- Over Voltage protection
- Under Voltage protection
- Start Voltage protection

Metering

U, I, P, Q, S, f and cos phi

Manual including experiments

Comprising full descriptions of the unit and necessary theory including examples to get started with essential experiments. Examples of some of the topics:

- Electrical diagrams and identifying components
- Basic theory
- Configuration and parameter setting
- Calculations of line model parameters
- Setting parameters for impedance zones (ZM1-ZM5, illustration figure below)
- Overcurrent protection settings
- Over-/under voltage protection settings
- Fault simulations Ph-Ph and Ph-E (<Z, >I, >U, <U) on medium voltage line (MV2222)
- Fault simulations Ph-Ph and Ph-E (<Z, >I, >U, <U) on high voltage line (MV2221)

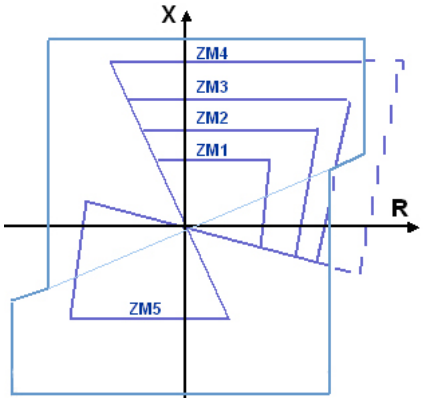

Illustration impedance zones ZM1-ZM5

Recommended external laboratory equipment

2 pc	Multimeter	
1 pc	Current clamp meter	DT2330
1 pcs	Voltmeter 50-250-500 V	MV1926
1 pc	A-meter 0-1-2 A	MV1922
1 pc	Power pack	MV1300
1 pc	Terminal board	MV1429
1 pc	3-ph power supply 0-230 V	MV1103
2 pc	Line model OH line 11kV, 5km	MV2222-ZN
2 pc	Line model OH line 230kV, 100km	MV2221-ZN
1 pc	Rheostat, 50ohm, 200W, 2A	MV1959
1 pc	3-ph load resistor 230V, 5A	MV1100-235
1 pc	Load reactor	MV1101
2 pc	Load switch	MV1500
1 set	Laboratory leads	MV1830-HF
1 pc	Stand for lab. Leads	MV1904
1 pc	PC	

Common specifications

Internal auxiliary and IED supply voltage	230 VAC, 50/60 Hz
Fuse internal auxiliary and IED supply	1A / 250VAC, Slow blow, Cartridge fuse, Glass 5x20mm
Mains control	Front panel switch
Power Bus	Nominal 400VAC, 2A
Power Bus Circuit Breaker Control with trip supervision/disconnection	
LED lamp indication of Power Bus Circuit Breaker status	
Current Transformers (CTs) Power Bus	Nom. Prim. 2A / Sec. 1A Tolerance Class 3: +/- 3%
Voltage Transformers (VTs) Power Bus	Nom. Prim. 230V / Sec. 110V Tolerance +/- 3% (idling voltage app. 117V)
Dimension: 51 x 56 x 28 (W x H x D) cm	
Weight: 29 kg	

Terco Headoffice

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