

POWER TRANSMISSION LINE TRAINER (Model: TMS-PET/TL)



SALIENT FEATURES

- ◆ PET/PRT Series trainers facilitate characteristics study of transmission line, load regulation, efficiency, power circle diagram, VAR Compensation, per unit representation, symmetrical & unsymmetrical faults, power flow, study & effect of Peterson coil, Numerical methods, **string insulator** etc.
- ◆ Simulates 400 KV, 50 / 60Hz, 3 Phase 1MVA. Transmission Line by scaling it down by 1000:1. Optionally second TL may be supplied for 3 bus experiments.
- ◆ XPO-PET/TL Trainer need a few set of associated panels which are mounted in a light weight sturdy aluminum profile flat demo modular panel system.

Technical Specifications

◆ Input 3 phase DOL Starter panel (EMT1) (10 Shrouded Banana)

- 4 pole MCB of 415 V/4A.
- DOL 9A Contactor with 230V / 50 Hz / 11VACOIL
- Bimetallic thermal O/L relay with range 2.5A-6A
- Green SBS5 socket is provided for extend earth.

◆ FWD-OFF-REV, Switch Panel (EMT 4A) (6 Shrouded Banana)

- FWD/REV, 3 pole 3 way switch with center OFF, 6A/440V.

◆ Integrated AC 3 phase measurement panel (EMT 34) X 2 (9 Shrouded Banana)

- Bidirectional Multifunction Meter
- 3 Phase 3/4 wire, 415V, CT Input 5A
- LCD/LED display, Aux supply 230V, 45-65 Hz, 5W
- V.I., Hz, Pf, KVA, KW, KWH
- Modbus RTU RS 485 with VWB software (optional)
- Green SBS5 socket is provided for extend earth.

◆ VAR Compensation panel (dual panel) (EMT43) (12 Shrouded Banana)

- Consisting of VAR compensating capacitors of 2, 4, 6, 8, 10 & 15 μ F each of 3 nos with 3 pole 7 way switch for selection.

◆ Transmission line Panel (EMT38) (24 Shrouded Banana)

Table Top Panel consisting of:

- Simulate model for transmission line constructed using R(10ohm/600W), L(0.15H/5A) and C (2.2uF/630V) 6 No. each component.
- Can Simulate model for medium/long (125 km/250 km) length transmission line for π model.
- Can Simulate model for medium/long (125 km/250 km) length transmission line for T model.
- Fan cooled table top setup for long life.

◆ String insulator simulation panel (EMT89) x 2 nos. (optional) (23 Shrouded Banana)

- Can Simulate 4 insulators string using 2 uF/440Vac capacitors - 4 nos & 0.22uF/630Vac capacitors - 6 nos.

◆ RLC load panel EMT42A/B/C (42 Shrouded Banana)

Table Top Panel consisting of:

- ◆ Facilitates easy and safe wiring by students due to use of 4mm sturdy Shrouded banana patch cords and shrouded socket arrangements for high voltage circuits
- ◆ Each panel has ABS molded plastic sturdy enclosure, and colorful screwless overlays showing circuits diagrams & its connection tag numbers for easy understanding and connection.
- ◆ Optionally PC based SCADAviewer (VWB) software may be provided.
- ◆ Set of Instructor Guide & Student Workbook.

- 3 nos of 1KW resistors with switch selectable 1(off) + 6 nos. of taps at 100, 112, 150, 175, 200 & 225 ohm & SIL tap of 262 ohm.
- 3 nos. of inductor 1.5H/1A with switch selectable 1(off) + 6 nos. of taps at 0.3, 0.6, 0.75, 0.9, 1.2 & 1.5H.
- Capacitors 440VAC rating (3 nos, one per phase) with switch selectable 7 nos of value of 2, 5, 10, 15, 20, 30 & 50 μ F.
- Fan cooled table top setup.

◆ 3 phase dimmer panel (EMT20D) (8 Shrouded Banana)

Table Top Panel consisting of:

- 3 phase dimmer I/P : 415VAC, 50Hz, O/P : 0 - 470 V AC, 6A, 3 phase.

List of Experiments:

1. Working with bi-directional 3 AC measurement panel, observing flow of real & reactive power & optionally modbus communication with PC.
2. No load test & Ferranti effect.
3. Determination of transmission line constants (ABCD) by experimental measurement using 2-port method as well as by knowing components values and its verification.
4. Load Test & Calculation of Regulation, efficiency of Transmission Line by Laboratory measurement method.
5. Working with power circle diagram & to find steady state power limit of transmission line.
6. Capacitive VAR compensation
7. Per unit representation
8. Symmetrical & unsymmetrical faults in transmission line, LG fault with & without **Petersen Coil**.
9. Predicting Power Flow in Transmission Line (2 bus) by Numerical method [Newton Raphson / Gauss-Seidel Method/ Fast Decouple Method]
10. **Optional** : Study of string insulator voltage distribution & determination of efficiency for a string of 4 insulators (single panel) & 7 insulators (Double panel) with & without guard ring.

◆ Mechanical Dimension (mm) & Weight of Trainer:

1165(L) x 300(W) x 990 (H)

◆ Net Wt.: 45 kg. Gross Wt.: 55 kg.

◆ EMT20D : 53 kg. EMT 42 : 60 kg. EMT 38 : 103 kg.