Order Code : 20213534.1
Name : Power System Trainer

Key Features: Simulates generation, transmission, transformation, distribution, utilization and protection in one self-contained unit
Includes prime mover and generator to simulate power generation
Twin distribution transformers for parallel transformer and load flow tests
Includes industrial-standard digital protection relays for realistic training
Key Specifications
Prime mover and generator
Eleven protection relays
Twin distribution transformers
Switched busbar with six feeders
Seven transmission lines
Two distribution loads
Two utilization loads
One dynamic load

Description
The Power System Trainer contains everything needed to teach students how electrical power systems work. It is a self-contained unit (only needs electrical power) with full safety features. It includes all the main parts of an electrical power system, from supply (generation) to demand (utilization). Each part includes dedicated industrial-standard protection relays that do specific jobs, from generator protection to distance protection on transmission lines, and distribution transformer protection.
Generator and grid supply
The Power system trainer has a motor (prime mover) and generator set to simulate power generation. This set has characteristics similar to industrial turbine and generator sets for realistic experiments. The output of the generator passes through a generator transformer to a 'generator bus'. Protection relays and circuit-breakers monitor and switch the generator field and output. The Power system trainer includes a fully monitored and protected grid supply transformer. This transformer simulates the larger grid transformers used in national grid supply systems. The grid transformer reduces the incoming mains supply to give the correct distribution voltage at the 'grid bus'. It also allows students to correctly synchronize the generator output to

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the grid supply. For realistic tests, students can use the grid supply or the generator as a power source for their experiments.

Transmission lines
A set of reactances simulate transmission lines of different lengths to model the characteristics of overhead or underground power cables. Each line includes test points to monitor the conditions along the lines. The user can simulate faults at different places along the transmission lines and discover the effects. A dedicated distance protection relay protects the lines and can indicate how far along the line the fault has occurred.

Transformation, distribution and utilization
As well as the grid supply and generator transformers, the Power System Trainer has two identical distribution transformers to simulate the distribution transformers fitted near to factories or houses. These transformers have variable tapping and feed a 'utilization bus'. Dedicated relays protect the transformers and can work in different ways, determined by student experiments. The utilization bus simulates electrical consumers (houses and factories). It includes variable resistive, capacitive and inductive loads, with an induction motor (dynamic) load. A switched busbar section includes a main bus and a standby or 'reserve bus'. These simulate a real bus switching system in a power plant or power distribution station. Protection relays and circuit-breakers monitor and switch the incoming and outgoing feeders of the busbar. One feeder of the busbar has a 'point-on-wave' circuit breaker for studies of switching transients.

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