JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Transformer, Switchgear and Motor Basics for New Technicians Training Course

15 – 19 November 2027
Milan

Transformer, Switchgear and Motor Basics for New Technicians Training Course

Ref: 3122_118547 **Date:** 15 – 19 November 2027 **Location:** Milan **Fees:** 7200 GBP

Transformer, Switchgear and Motor Basics for New Technicians is a 1-week training course for new electrical technicians and engineers from other disciplines who must recognise, read and talk about power equipment with confidence, and it ends with each participant building an Equipment Identification Pack for one real installation. Sites are adding electrical load faster than they can recruit experienced staff. Transformer, switchgear and motor basics are taught by Jupiter Prime Training.

Why Transformer, Switchgear and Motor Basics Matter Now

Three pressures shape this subject. Electrification of heating, transport and process drives is putting more transformers, switchboards and motors into sites that once had little electrical plant. Experienced electricians are retiring. An organisation whose newcomers can interpret a nameplate, follow a single-line diagram and name each device correctly avoids wrong orders, unsafe assumptions and long handovers. The course rests on the rating conventions printed on equipment and the symbols used on electrical drawings.

Who Gains Most from Transformer, Switchgear and Motor Basics

- Newly qualified technicians who will connect, inspect and report on low and medium voltage equipment
- Mechanical and process engineers who specify driven machinery and must match motors to loads
- Project and site engineers who check deliveries against drawings and datasheets
- Planners and stores staff who order spares from nameplate details
- Instrument and control technicians who work alongside motor starters and panels

A new maintenance crew or a graduate intake gains most when several members attend together.

Transformer, Switchgear and Motor Basics Capabilities

Participants learn to explain what sits inside each cabinet or motor and what its markings mean.

- Explain how a transformer changes voltage and current through its windings and core — supervisors approving connections
- Interpret motor nameplate data such as power, speed, duty and insulation class — engineers matching drives to loads
- Distinguish circuit breakers, contactors, fuses and isolators by purpose and rating — technicians preparing safe isolation
- Select cable sizes from current, length and installation method in simple cases — designers checking voltage drop
-

Trace a supply path on a single-line diagram and a schematic — teams planning shutdowns
- Describe how protection relays and fuses clear faults — staff reporting trips accurately

Key Transformer, Switchgear and Motor Basics Terms

- Turns ratio — the ratio of primary to secondary winding turns that sets how a transformer steps voltage up or down.
- Vector group — a code on a transformer nameplate showing how windings are connected and the phase shift between them.
- Short-circuit breaking capacity — the largest fault current a breaker can interrupt safely without damage.
- Service factor — the permitted continuous overload a motor can carry above its rated power without harm.
- Single-line diagram — a simplified drawing that shows a three-phase system as one line with its main devices.
- Ingress protection rating — a two-digit code describing how well an enclosure resists dust and water.

Transformer, Switchgear and Motor Basics Day by Day

Day 1: How Power Reaches the Load

- Voltage, Current, Power and Power Factor — Sizing Supplies for Real Loads
- Three-Phase Systems and Phase Rotation — Connecting Equipment Correctly
- Supply Chain from Incomer to Final Circuit — Locating Each Device
- Earthing Arrangements and Their Purpose — Choosing Safe Connection Points
- Electrical Symbols and Drawing Types — Reading Site Documents Quickly

Day 2: Transformers Inside and Out

- Core, Windings and Turns Ratio — Predicting Secondary Voltage
- Transformer Nameplate and Vector Group — Paralleling and Replacement Choices
- Tap Changers and Voltage Adjustment — Correcting Supply Levels at Site
- Oil-Filled and Dry-Type Construction — Matching Units to Locations
- Losses, Cooling Classes and Temperature Rise — Judging Loading Limits

Day 3: Switchgear, Cables and Protection Devices

- Breakers, Contactors, Fuses and Isolators — Assigning the Right Switching Duty
- Breaking Capacity and Rated Current — Confirming Devices Suit the Fault Level
- Cable Construction, Sizing and Voltage Drop — Selecting Conductors for Circuits
- Overcurrent and Earth Fault Relays — Explaining Why a Feeder Tripped
- Enclosure Ratings and Panel Layouts — Placing Gear in Harsh Areas

Day 4: Motors and Their Starters

- Induction Motor Principles and Slip — Relating Speed to Load
- Motor Nameplate, Duty Cycle and Insulation Class — Ordering Matching Spares
- Direct-On-Line, Star-Delta and Soft Starting — Limiting Starting Current
- Variable Speed Drives Basics — Saving Energy on Pumps and Fans
- Motor Overload and Thermal Protection — Setting Trips to Rated Current

Day 5: Practising the Equipment Identification Pack

- Site Walk-Down Against a Single-Line Diagram — Confirming Drawings Match Installed Plant
- Nameplate Capture for Transformers and Motors — Recording Ratings Accurately
- Protection Device Schedule — Linking Each Feeder to Its Breaker or Fuse
- Cable Route and Size Check — Spotting Undersized or Unlabelled Circuits
- Equipment Identification Pack — Handing a Clear Record to the Shift Team

Applying Transformer, Switchgear and Motor Basics After the Course

- Lead a walk-down of one switch room, comparing every breaker and transformer nameplate with the single-line diagram and marking differences.
- Build a motor register for one production line, recording power, speed, starter type and overload setting from each nameplate.

Transformer, Switchgear and Motor Basics Questions FAQ

What are transformer, switchgear and motor basics and why do they matter now?

They are the working principles, ratings and drawings behind the equipment that carries power to every load. They matter now because sites are adding electrical plant quickly while experienced staff retire, so newcomers must read them correctly.

Which roles gain most from transformer, switchgear and motor basics?

New electrical technicians gain most, followed by mechanical, process and project engineers who approve electrical items.

How does transformer, switchgear and motor basics differ from a course on equipment lifecycle or testing?

It explains how the equipment works and how to read it, rather than how to test, monitor or plan its replacement.

What do you bring back from transformer, switchgear and motor basics?

You bring back an identification record for one real installation, with nameplate data, protection devices and cable details tied to the single-line diagram.

Transformer, Switchgear and Motor Basics: The Way Forward

The Equipment Identification Pack first informs the decision on whether site drawings can be trusted for the next isolation or shutdown. Shift technicians, planners and supervising engineers use it as a shared reference. After its first use, revisit how ratings were recorded and whether the protection schedule still matches installed plant.