

# CLTB Essential Electrics & Refrigeration Controls

5 Day - £695

## 1. Electrical Concepts

- 1.1 Magnetism
- 1.2 Electrical Terms
- 1.3 Conductors and Insulators
- 1.4 Relationships (Ohms Law)
- 1.5 Series and Parallel Circuits
- 1.6 Electrical Power
- 1.7 Inductors
- 1.8 Direct and Alternating Current
- 1.9 Rectifiers
- 1.10 Single Phase Motors
- 1.11 Three Phase Motors

## 2. Safe Isolation

- 2.1 Electric Shock
- 2.2 Body Resistance
- 2.3 Removing Persons from Live Conductors
- 2.4 First Aid
- 2.5 Electrical Isolation
- 2.6 Test Lamps and Proving Units

## 3. Instrumentation

- 3.1 Measurement of Voltage, Current and Resistance
- 3.2 Analogue and Digital Displays
- 3.3 Meter Calibration
- 3.4 Battery Condition and Continuity of Test Leads
- 3.5 Earth Continuity Testing
- 3.6 Insulation Resistance Testing

## 4. Electrical Regulations

- 4.1 Electricity at Work Regulations 1989
- 4.2 Electricity Supply Regulations 1988
- 4.3 The Low Voltage Electrical Equipment (Safety) Regulations 1989
- 4.4 Health and Safety at Work Act 1974

## 5. Supply Systems

- 5.1 The Distribution System
- 5.2 AC Supply
- 5.3 Electricity into the Building
- 5.4 Control and Protection Equipment
- 5.5 Identification Notices
- 5.6 BS 4343 Plugs and Sockets

## 6. Earthing and Bonding

- 6.1 Earthing Arrangements
- 6.2 Earthed Equipotential Bonding
- 6.3 Types of Circuit Protective Conductors
- 6.4 Supplementary Bonding Conductors
- 6.5 Temporary Continuity Bonding

## 7. Termination Skills

- 7.1 Stripping Insulated Cables
- 7.2 Types of Terminals
- 7.3 Identification of Conductors
- 7.4 Termination Tooling

## 8. Electrical Safety

- 8.1 Electrical Safety Checks
- 8.2 PAT Testing
- 8.3 RCD Protection
- 8.4 CPC Continuity
- 8.5 Insulation Resistance

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## 9. Circuit Protection

- 9.1 Fuses
- 9.2 Miniature Circuit Breakers (mcb)
- 9.3 Circuit & Equipment Overload
- 9.4 Safety Relays
- 9.5 Phase Loss
- 9.6 Compressor Klixons

## 10. Controls

- 10.1 Thermostats
- 10.2 Remote Sensing Equipment
- 10.3 Comfort Cooling
- 10.4 Central Plant

## 11. Detectors / Sensors

- 11.1 Temperature
- 11.2 Pressure HP / LP / Oil
- 11.3 Hot Gas
- 11.4 Defrost
- 11.5 Humidity

## 12. Motors

- 12.1 Single Phase Variants
- 12.2 Current Relays
- 12.3 Potential Relays
- 12.4 Capacitors
- 12.5 Three Phase Variants
- 12.6 D.O.L
- 12.7 Star Delta
- 12.8 P.W.S

## 13. Typical Electrical Circuits

- 13.1 Basic Principles
- 13.2 2 Golden Rules
- 13.3 Circuit Diagrams

## 14. Inspection and Testing

- 14.1 Reasons for Inspection and Testing
- 14.2 Test Instruments
- 14.3 Safety
- 14.4 Continuity of Protective Conductors
- 14.5 Polarity Testing
- 14.6 Monitoring Running Conditions