Unit 306E: Understand how to inspect and test de-energised electrical circuits

# Delivery guide

Unit information

This unit covers the knowledge and understanding of the fundamental inspections and de-energised tests required for single-phase circuits.

Learners will be able to comply with the processes and procedures for fundamental inspections and de-energised tests in accordance with the current versions of the appropriate industry standards and regulations, the specification and industry-recognised working practices.

Learners may be introduced to this unit by asking themselves questions such as:

* Why is electrical work inspected and tested?
* Why is safe isolation essential?

Guidance: the emphasis in this unit is on learners correctly carrying out fundamental inspections and de-energised tests on typical common circuits to include ring and radial final circuits and lighting circuits. Learners will be able to utilise test equipment, evaluate test results and record outcomes accurately.

Learning outcomes

1. Understand how to select the instruments to be used for carrying out relevant tests
2. Understand the methods and procedures for conducting a visual inspection on the enclosures cables, conductors and wiring systems
3. Understand the correct procedure for safe isolation
4. Understand the methods and processes to carry out correctly the tests that ensure safe and efficient operation of the electrical system
5. Understand the methods for providing clear and accurate information to relevant people

Suggested resources

Textbooks

* *IET Guidance Note 3 Inspection and Testing* (2018) 18th edition. London: Institution of Engineering and Technology.

ISBN 978-1-7856-1452-1

* *IET On-Site Guide (BS 7671:2018) (Electrical Regulations)*, 7th edition. London: Institution of Engineering and Technology.

ISBN 978-1-7856-1442-2

Websites

* [Electrical Apprentice | Testing](https://electricalapprentice.co.uk/tag/testing/)
* [Electrical Safety First | Best Practice Guide 2](https://www.electricalsafetyfirst.org.uk/media/1201/best-practice-guide-2-issue-3.pdf)
* [Electrical Training | Video Tutorials](https://www.djtelectricaltraining.co.uk/electricians-help-guides/video-tutorials.html)
* [YouTube | Chris Kitcher](https://www.youtube.com/user/chriskitcher)

British Standards

* BS EN 61557-2:2007. *Electrical safety in low-voltage distribution systems up to 1000 V a.c. and 1500 V d.c. Equipment for testing, measuring or monitoring of protective measures – insulation resistance.*
* BS EN 61557-6:2007. *Electrical safety in low-voltage distribution systems up to 1000 V a.c. and 1500 V d.c. Equipment for testing, measuring or monitoring of protective measures. Effectiveness of residual current devices (RCD) in TT, TN and IT systems.*

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
| --- | --- | --- |
| 1. Understand how to select the instruments to be used for carrying out relevant tests | * 1. The test instruments required for de-energised tests on standard single-phase circuits | * Learners to select the test instruments for testing de-energised single-phase circuits, including: * continuity tester (low resistance ohm meter) * insulation resistance tester * the leads and accessories for the instruments. |
| * 1. How to confirm that the test instruments are fit for purpose and have a current calibration certificate | * Learners to check workshop testing instruments by inspecting that a valid calibration sticker (and certificate) is attached. * Learners to check that there is no physical damage before and after use. * Learners to check that instruments comply with the information given in *IET Guidance Note 3*, section 4. * Learners to understand that the basic instrument standard is BS EN 61557-2:2007 (see *IET Guidance Note 3*, section 4). * Learners to understand that test instruments require a current calibration certificate for their continued use. |
| 1. Understand the methods and procedures for conducting a visual inspection on the enclosures cables, conductors and wiring systems | * 1. How to confirm the installed electrical equipment is located and secured correctly and is electrically and mechanically sound | * Learners to understand: * how to confirm that electrical equipment is located and secured correctly and is electrically and mechanically sound * how to confirm that conductors are both electrically and mechanically sound * how to confirm electrical soundness by completing low-resistance tests * how to confirm mechanical soundness by completing tug tests and torque tightness * the key requirements of the *IET On-Site Guide* and *IET Guidance Note 3* when confirming that electrical equipment is located and secured correctly. * Learners to conduct a visual inspection of a fully isolated simple electrical installation within a supervised workshop environment which can be checked against the Schedule of inspections document given in *IET Guidance Note 3*, section 5. |
| * 1. How to carry out a visual inspection of the main/key aspects of standard single-phase circuits | * Learners to understand: * the main/key aspects of carrying out a visual inspection on standard single-phase circuits * that the inspection process involves the application of human senses such as sight, touch, hearing and smell * that inspections are conducted during construction and on completion for new work * that any non-compliances must be rectified before any certification can be issued for new work. |
| 1. Understand the correct procedure for safe isolation | * 1. The safe isolation procedure | * Learners to understand how to carry out the safe isolation procedure, including: * the reasons for safe isolation * the pre-isolation considerations to others and equipment/circuits * the correct procedure for safe isolation (see Electrical Safety First website in Suggested resources). * Learners to be shown the safe isolation procedure via demonstration as this is an electrically live procedure. |
| 1. Understand the methods and processes to carry out correctly the tests that ensure safe and efficient operation of the electrical system | * 1. How to carry out de-energised tests on standard single-phase circuits | * Learners to understand: * why test instruments, leads and accessories should be handled with care * how to carry out de-energised tests on standard single-phase circuits * how to carry out tests for continuity of protective bonding conductors * how to carry out tests for continuity of circuit protective conductors * how to carry out tests for insulation resistance * how to carry out tests for polarity. * Learners to carry out dead testing on all their constructed circuits by following the procedures shown in *IET Guidance Note 3*, section 2. |
| 1. Understand the methods for providing clear and accurate information to relevant people | * 1. How to record outcomes from basic inspections and dead tests clearly and accurately | * Learners to understand: * how to record outcomes from inspections and dead testing clearly and accurately * how to complete the relevant sections of the schedule of inspections (see the *IET On-Site Guide* and *IET Guidance Note 3*) * how to complete the relevant sections of the schedule of test results (see the *IET On-Site Guide* and *IET Guidance Note 3*) * that a full set of documentation for new work includes an Electrical Installation Certificate in addition to the schedule of inspections and schedule of test results. * Learners to record their test results on the Generic Schedule of Test Results document which is available as a free download from the IET website. |