



Code of Practice for In-service Inspection and Testing of Electrical Equipment

4th Edition

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Contents

Cooperating organizations	9
Acknowledgements	10
Preface	11
Introduction	13
Part 1 Administration of Inspection and Testing	17
1 Scope	19
1.1 Users of electrical equipment, persons managing a maintenance scheme, persons performing inspections and tests, and other duty-holders	19
1.1.1 Users of electrical equipment	19
1.1.2 Persons managing a maintenance scheme (duty-holders)	19
1.1.3 Persons undertaking the practical inspection and testing of electrical equipment	19
1.1.4 Other duty-holders such as landlords, company directors, managers and building services managers etc.	20
1.2 Equipment	20
1.2.1 Medical electrical equipment	20
1.3 Premises	20
1.4 Voltages and phases	20
1.5 Summary of the objectives of this Code of Practice	21
2 Definitions	23
3 The law	33
3.1 The legislation	33
3.1.1 The Health and Safety at Work etc. Act 1974	33
3.1.2 The Management of Health and Safety at Work Regulations 1999	33
3.1.3 The Provision and Use of Work Equipment Regulations 1998	34
3.1.4 The Electricity at Work Regulations 1989	34
3.1.5 Workplace (Health, Safety and Welfare) Regulations 1992	35
3.1.6 The Housing Act 2004 (England and Wales)	35
3.1.7 The Housing (Scotland) Act 2006	36
3.1.8 The Electrical Equipment (Safety) Regulations 1994	36
3.1.9 Waste Electronic and Electrical Equipment Regulations 2006 (WEEE directive)	36
3.2 Scope of the legislation	37

3.3	Who is responsible?	37
3.4	Maintenance	38
4	Fixed electrical installation	39
4.1	Means of earthing	39
4.2	RCD protection	39
4.3	Sufficient socket-outlets should be provided	40
4.4	Damaged accessories	40
4.5	Specialized installations	41
5	Types of electrical equipment	43
5.1	Portable appliances or equipment	43
5.2	Movable appliances or equipment (sometimes called transportable)	43
5.3	Hand-held appliances or equipment	44
5.4	Stationary appliances or equipment	44
5.5	Fixed equipment or appliances	45
5.5.1	Inspection and testing of fixed equipment or appliances	45
5.6	Appliances or equipment for building-in	46
5.7	Information technology equipment	46
5.8	Extension leads and RCD extension leads	46
5.9	Multiway adaptors and RCD adaptors	46
5.10	Surge protective devices	46
6	The electrical tests	47
6.1	Testing throughout the life of equipment	47
6.2	Manufacturer's type testing	47
6.3	Manufacturer's production testing	47
6.4	In-service inspection and testing	47
6.5	Testing after repair	48
7	In-service inspection and testing	49
7.1	Inspection	49
7.1.1	Risk-based assessments	49
7.2	Categories of inspection and testing	50
7.3	Frequency of inspection and testing through risk-based assessments	50
7.4	Review of frequency of inspection and testing	53
8	Procedures for in-service inspection and testing	55
8.1	The basic requirement	55
8.2	Test equipment	55
8.3	Documentation	56
8.4	Labelling	56
8.5	Damaged or faulty equipment	57
8.6	User responsibilities	57
8.7	Availability of records	57

9	Training	59
9.1	Requirements and responsibilities	59
9.2	The user	59
9.3	The duty-holder or manager	60
9.4	The inspector	60
9.5	The test operative	60
	9.5.1 Training	60
	9.5.2 Experience	61
9.6	The person repairing faulty equipment	61
10	Test instruments	63
10.1	Safety of test equipment	63
	10.1.1 Test instruments	63
	10.1.2 Test probes and leads	63
	10.1.3 Test probes and leads for use in conjunction with a voltmeter, multimeter, electrician's test lamp or voltage indicator	63
10.2	Portable appliance test instruments	63
	10.2.1 Three-phase equipment	65
10.3	Low resistance ohmmeters (for earth continuity testing)	65
10.4	Insulation resistance ohmmeters (applied voltage method)	66
10.5	Instrument accuracy	67
	Part 2 Inspection and Testing (including user checks)	69
11	Equipment construction types	71
11.1	Class I	72
	11.1.1 Class I typical construction showing basic insulation and earthed metal	72
	11.1.2 Class I construction showing the use of air as a basic insulation medium	73
	11.1.3 Class I construction incorporating unearthed metal separated from live parts by basic and supplementary insulation	73
	11.1.4 Class I construction incorporating unearthed metal separated from live parts by basic insulation and earthed metal	74
11.2	Class II	74
	11.2.1 Class II equipment with a substantial enclosure of insulating material comprising basic and supplementary insulation	75
	11.2.2 Class II equipment with a substantial enclosure of reinforced insulating material	75
	11.2.3 Class II equipment with a substantial enclosure of insulating material – the insulation construction includes air	76
	11.2.4 Class II equipment with unearthed metal in the enclosure, separated from live parts by basic and supplementary insulation	76
	11.2.5 Class II equipment with unearthed metal separated from live parts by reinforced insulation	77
	11.2.6 Class II equipment with unearthed metal separated from live parts by basic and supplementary insulation including air gaps	77
	11.2.7 Metal-encased Class II equipment	78

11.3	Class III	78
11.4	Class 0 and 0I	79
11.4.1	Class 0 equipment	79
11.4.2	Class 0I equipment	79
12	Types of inspection and testing	80
13	The user check	81
14	The formal visual inspection	85
14.1	Manufacturer's instructions	85
14.2	Suitability of the equipment for the environment	85
14.3	Switching of equipment	86
14.3.1	Functional switching	86
14.3.2	Isolation and switching off for mechanical maintenance	86
14.3.3	Emergency switching	87
14.4	User feedback	87
14.5	The equipment	88
14.6	Equipment failing the formal visual inspection	88
14.7	Recording the formal visual inspection	88
15	Combined inspection and testing	89
15.1	Preliminary inspection	90
15.2	Test procedures	90
15.3	In-service tests	91
15.4	The earth continuity test	91
15.5	The insulation resistance test	93
15.6	Protective conductor/touch current measurement	95
15.7	Functional checks	96
15.8	Damaged or faulty equipment	96
15.9	Appliance lead sets	97
15.10	Extension leads, multiway adaptors and RCD adaptors	97
15.10.1	Extension leads	97
15.10.2	RCD extension leads	98
15.10.3	Multiway adaptors and RCD adaptors	99
15.11	High protective conductor currents	100
15.12	Replacement of appliance flexes	101
15.13	Plug fuses	101
15.14	Equipment that cannot be located	102
16	New and third party equipment	103
16.1	New equipment and appliances	103
16.2	Second-hand equipment and appliances	103
16.3	Hired equipment	103

Part 3	Appendices	105
I	British Standards	107
II	Legal references and notes	109
II.1	Health and Safety at Work etc. Act 1974	110
II.2	The Electricity at Work Regulations 1989	110
II.3	Management of Health and Safety at Work Regulations 1999	111
II.4	Provision and Use of Work Equipment Regulations 1998	112
II.4.1	General	112
II.4.2	Maintenance	112
II.4.3	Inspection of work equipment that poses electrical risks	112
II.4.4	Specific risks	113
II.4.5	Information and instructions	113
II.4.6	Training	113
II.4.7	Isolation from sources of energy	113
II.4.8	Maintenance operations	113
III	The Electricity at Work Regulations	115
III.1	Regulation 4: Systems, work activities and protective equipment	115
III.1.1	Regulation 4(2)	115
III.1.2	Regulation 4(3)	116
III.2	Regulation 5: Strength and capability of electrical equipment	116
III.3	Regulation 6: Adverse or hazardous environments	116
III.4	Regulation 7: Insulation, protection and placing of conductors	117
III.5	Regulation 8: Earthing or other suitable precautions	117
III.6	Regulation 10: Connections	117
III.7	Regulation 12: Means of cutting off the supply and for isolation	118
III.8	Regulation 13: Precautions for work on equipment made dead	118
III.9	Regulation 14: Work on or near live conductors	119
III.10	Regulation 15: Working space, access and lighting	119
III.11	Regulation 16: Persons to be competent to prevent danger and injury	119
III.11.1	'... prevent danger or, where appropriate, injury ...'	119
III.11.2	Technical knowledge or experience	120
III.11.3	Allocation of responsibilities	120
III.11.4	Supervision	120
IV	Summary of legislation and guidance	121
V	Model forms for in-service inspection and testing	125
Form V.1	Equipment register	126
Form V.2	Equipment formal visual and combined inspection and test record	127
Form V.3	Equipment labels	129
Form V.4	Repair register	130
Form V.5	Faulty equipment register	131
Form V.6	Test instrument record	132

VI	Resistance of flexible cables	133
VII	Checks to be made on a plug, a cable and an extension lead	135
VIII	Guide to isolation procedures	141
	Index	143

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Preface

The objective of this Code of Practice is to give advice on in-service inspection and testing to determine whether electrical equipment is fit for continued service or if maintenance or replacement is necessary.

The main changes in this edition of the Code of Practice include clarification of which equipment is covered, the inclusion of hired and second-hand equipment and a change in the scope. In addition, there is an explanation of the risk assessment required to determine frequencies between inspection and testing, if it is required.

Information on microwave leakage testing is not within the remit of this Code of Practice, because it does not directly relate to 'electrical safety'. For this reason microwave in-service leakage testing has been removed.

Production testing, previously included in this Code of Practice, has been removed as it is not relevant to in-service inspection and testing.

Changes have been made to the initial frequencies in Table 7.1, to reflect information made available from equipment manufacturers, which is based on historic test results.

This Code of Practice does not cover in-house inspection and testing of equipment or appliances that are used for commercial gain hire purposes. Equipment hire companies should refer to the Hire Association of Europe (HAE) (www.hae.org.uk) and Event Hire Association (EHA) (www.eha.org.uk), whose document *HAEEST2012: 'Guidance on Electrical Safety Testing in the Hire Industry'* gives information on in-service inspection, maintenance, return to service after repair and regimes for hire equipment prior to its release to customers/clients.

Introduction

Why is it necessary to maintain electrical equipment?

Electric shock can kill or seriously injure. This is one of the hazards that electrical safety legislation is intended to protect against. Many serious shocks occur when the current flow is from hand to hand, because the route the current takes is through or near the heart.

The Electricity at Work Regulations requires, in Regulation 4(2), that:

As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger.

Regulation 4(2) is concerned with the need for maintenance to be done in order to ensure safety of the system if danger would otherwise result. The quality and frequency of maintenance should be sufficient to prevent danger, so far as is reasonably practicable.

Regular inspection of equipment is an essential part of any preventive maintenance programme. Practical experience of the use of equipment and its environment may indicate an adjustment to the frequency with which preventive maintenance needs to be carried out. This is a matter for the judgement of the responsible person or duty-holder, who should seek all the information needed to make an informed decision including reference to the manufacturer's guidance.

Although the Electricity at Work Regulations does not require records of maintenance to be kept, it is recommended that records of maintenance, including test results, should be kept throughout the working life of the electrical equipment to enable

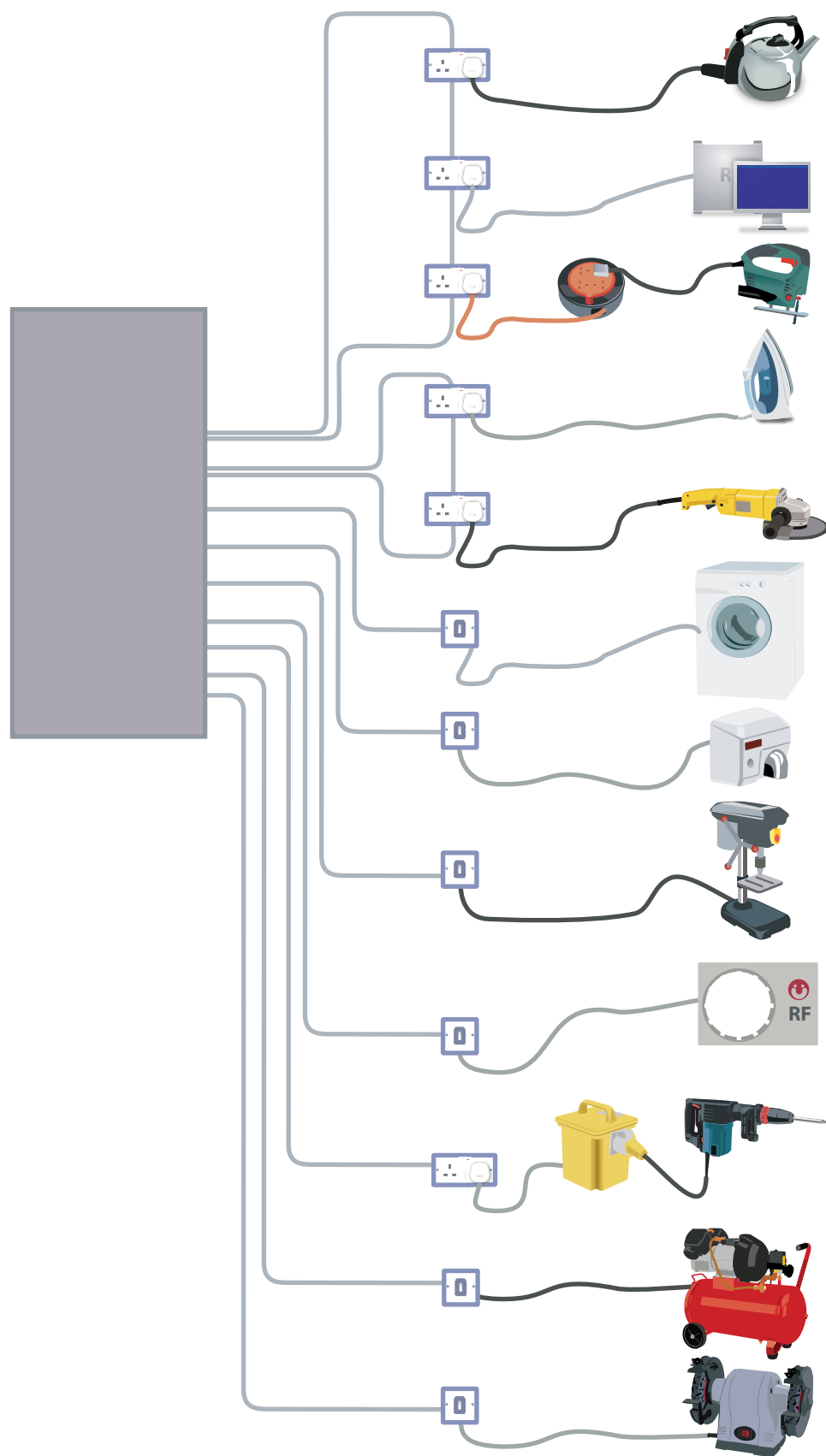
- ▶ the condition of the equipment to be monitored,
- ▶ the effectiveness of the maintenance policies to be assessed,
- ▶ the demonstration that an effective maintenance system is in place, and
- ▶ the duty-holder responsible for the inspection and testing regime to assess the future frequency required between formal visual inspections and any combined inspections and tests.

What should be maintained?

All electrical systems and equipment should be maintained if danger would otherwise arise (see Figure 1).

Other than the fixed installation, which is considered to be the installation from the meter point to the socket-outlet, or fuse connection unit, all electrical equipment in an installation, whether permanently connected or connected by a plug and socket-outlet,

▼ **Figure 1** Examples of equipment covered by this Code of Practice



should be inspected and tested in accordance with the recommendations contained in this Code of Practice.

Items of heavy plant, including air handling units (AHUs), heating ventilation and air conditioning (HVAC) systems, and other items of integrated plant and their associated systems, are not covered by this Code of Practice. These types of systems should form part of a specialized maintenance and inspection routine. The connecting cables and junction boxes for integrated plant should be inspected and tested during the electrical installation's periodic inspection regime and a report of its condition given in the Electrical Installation Condition Report.

Note: Self-contained or two-part air conditioners and climate control units, which are not AHU or HVAC systems, are within the scope of this Code of Practice.

BS 7671 The fixed installation should be periodically inspected and tested to ensure its satisfactory condition for continued use as required by BS 7671:2008 (2011) *Requirements for Electrical Installations, 17th Edition of the IET Wiring Regulations*. Guidance on the requirements of BS 7671, concerning inspection and testing of the fixed electrical installation, is given in the IET's Guidance Note 3: *Inspection & Testing* (GN3).

GN3

Who has responsibilities?

The following people have responsibility for electrical systems and equipment:

- ▶ users of electrical equipment (whose responsibilities include user checks)
- ▶ duty-holders with responsibility for electrical maintenance who may not necessarily have detailed technical knowledge
- ▶ the competent person carrying out the formal visual inspection and the inspections and tests
- ▶ other duty-holders such as company directors, managers or building services managers
- ▶ hirers and suppliers of hired equipment (additional advice can be found on the Trading Standards Institute website, www.tradingstandards.gov.uk)
- ▶ landlords and property management companies in control of Houses in Multiple Occupation (HMOs).

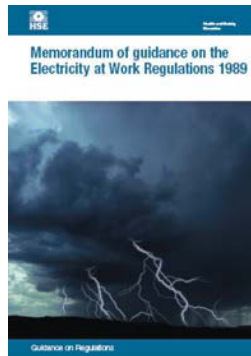
What needs to be done to comply with the relevant requirements of the Electricity at Work Regulations?

The requirements of the Electricity at Work Regulations 1989 can be met by

- 1** performing in-service inspection and testing, which consist of three activities:
 - i** user checks
 - ii** formal visual inspections (without tests)
 - iii** combined inspections and tests (although the Electricity at Work Regulations do not require the keeping of records, up-to-date information can be a means of showing that a maintenance scheme exists)
- 2** performing maintenance or, if necessary, replacing the defective item of equipment (depending upon the results of the in-service inspection and testing), and
- 3** keeping up-to-date records that can be a means of showing compliance.

▼ Figure 2

HSR25: Memorandum of Guidance on the Electricity at Work Regulations 1989
[Courtesy of the HSE]



Information on the Electricity at Work Regulations can be found in the Health and Safety Executive (HSE) publication *Memorandum of Guidance on the Electricity at Work Regulations 1989* (see Figure 2). This publication is now available as a free download from www.hse.gov.uk.

Background to the Code of Practice

To encourage free trade within the European Union, existing national standards are being harmonized and converted to European standards. Compliance with harmonized European standards gives assurance to purchasers that appliances and equipment have been designed and constructed to a standard that ensures in normal use, as intended by the manufacturer, they function safely.

In order to check compliance, manufacturers have to perform a series of tests on the appliance and its components as required by the standard. The appliance is required to pass these tests if it is to be said that it complies with the standard. A list of some of the safety standards for electrical equipment is given in Appendix I. The tests detailed in these standards are generally not suitable for in-service testing.

This Code of Practice recommends in-service inspections and tests that can be applied generally to equipment and appliances in normal use. Routine manufacturers' tests are not required for general in-service testing, but may be applied to appliances after repair.

Layout of the Code of Practice

Part 1 provides guidance on what work should be done in order to comply with the applicable legislation, including the Electricity at Work Regulations, and whether this work can be carried out in-house. Advice is included on the law, procedures, documentation and training.

Part 2 is written for those carrying out the practical work and explains the details of the inspections and tests.

Part 3 comprises a series of appendices containing information and guidance and includes model forms that allow records to be kept in order to demonstrate that an effective system of maintenance is in place.

Index

Note: Entries refer to chapter and section numbers; Appx=Appendix; 'n' refers to the notes following a table.

A

accessible metal part, definition	Chap 2
accessories, definition	Chap 2
accuracy, test instruments	10.3; 10.5
adaptors, multiway	5.9; 15.10.3; Table 15.1
administrators' responsibilities	1.1.2; 9.3
adverse environments: see hazardous locations	
appliance, definition	Chap 2
appliance lead sets: see lead sets	
ASTA mark	15.13; Appx VII.1

B

basic insulation	Chap 2
basic protection	Chap 2
Batteries Directive 2006	3.1.9
battery operated equipment	Table 7.1 n6
British Standards	Appx I
BS 1362	15.13; Appx VII.1
BS 1363	15.12; Appx VII.1
BS 1363A	Appx VII.1
BS 6360	Appx VI.1
BS 6500	Appx VI.1
BS 7071	Table 15.5
BS 7288	Table 15.5
BS 7671	4.3; 11.3; 14.3.2; 15.10.1; 15.11
BS EN 60309	10.2.1; 15.10.1; 15.11
BS EN 60335	11.3
BS EN 60742	11.3
BS EN 60950	10.4; 15.11; Table 15.2 n3
BS EN 61008	15.10.2; Table 15.5
BS EN 61009	15.10.2; Table 15.5
BS EN 61010	10.1.1; 10.1.2
BS EN 61557	10.3; 10.4
BS EN 61558	11.3
built-in equipment/appliances	5.6
business equipment	
isolation	14.3.2; 15.1
see also IT equipment	

C

cable reels	Appx VII.3
cables: see flexible cables	
calibration, test instruments	10.5
catering equipment	Table 7.1

CE marking	16.2
children's rides	Table 7.1 n3
Christmas tree lights	11.4.1; 15.13
circuit protective conductor (cpc)	Chap 2
Class 0 equipment	Chap 2; 11.4.1
Class 0I equipment	11.2.7; 11.4.2
Class I equipment	11.1
definition	Chap 2
earth continuity testing	15.4
frequency of inspection and testing	Table 7.1
insulation resistance	Table 15.2
protective conductor/touch current test	15.6; Table 15.3
Class II equipment	11.2
definition	Chap 2
frequency of inspection and testing	Table 7.1
insulation resistance	Table 15.2
protective conductor/touch current test	15.6; Table 15.3
Class III equipment	11.3
definition	Chap 2
insulation resistance	Table 15.2
protective conductor/touch current test	Table 15.3
clearance distance	11.1.2
combined inspection and testing	Chap 15; 6.4; 7.2; Table 7.1
appliance flexes	15.12
appliance lead sets	15.9
damaged or faulty equipment	15.8
earth continuity testing	15.4
equipment with high protective conductor currents	15.11
extension leads	15.10.1
frequency of inspection and testing	7.4; Table 7.1
insulation resistance testing	15.5
multiway adaptors	15.10.3
plug fuses	15.13
preliminary inspection	15.1
RCD adaptors	15.10.3
requirements	15.3
safe working practices	Chap 15
sequence of testing	15.3
unlocated equipment	15.14
combustible dust: see hazardous locations	
commercial kitchens	Table 7.1
competent person	Chap 2
see also test operatives	
computer equipment: see IT equipment	
connections	Appx III.6; Appx VII.1
construction sites	Table 7.1
contact resistance	10.3
cooking appliances	Table 15.2 n1
creepage path	11.1.2
crocodile clips	10.3
cross-sectional areas	
appliance flexes	Table 15.6
extension leads	Table 15.4
current-using equipment	Chap 2
D	
damaged equipment	4.4; 8.5; 15.8
recurring damage	7.3; 7.4

- register Appx V.5
- user checks Chap 13
- danger, definition Chap 2
- dielectric strength testing 6.3; 15.3
- direct contact Chap 2
- disconnection: see isolation of installation
- documentation Appx V; 8.3
 - equipment registers 8.3; Appx V.1
 - faulty equipment Appx V.5
 - model forms Appx V
 - repair register 8.3; Appx V.4
 - responsibilities 9.3
 - test instruments 10.5; Appx V.6
 - test records 8.3; Appx V.2
- double insulation Chap 2
- duty-holders 1.1.2; 1.1.4
 - responsibilities 7.3; 8.3; 9.3
 - risk-based assessments 7.1.1
- E**
- earth, definition Chap 2
- earth continuity testing 10.3; 15.4
- earthing
 - definition Chap 2
 - equipment with high protective conductor currents 15.11
 - protective 11.1
 - regulations Appx III.5
- Electrical Equipment (Safety) Regulations 1994 3.1.8
- electrical equipment, definition Chap 2
- electrical installation, definition Chap 2
- electric blankets 15.13
- electric drills 15.6
- Electricity at Work Regulations 1989 Appx III; 3.1.4; Appx II.2
 - frequency of inspection and testing 7.3
 - maintenance of equipment 3.3; 8.1
 - training 9.1
- electric shock Chap 2; 5.3
- electric strength tests
 - see also insulation resistance testing
- EMC filters 15.11; Table 15.2 n
- emergency stopping 14.3.3
- emergency switching 14.3.3
- enclosure, definition Chap 2
- equipment labels Appx V.3
- equipment registers 8.3
 - model form Appx V.1; Appx V.5
 - test instruments 10.5; Appx V.6
- equipment types 1.2
- explosive atmospheres: see hazardous locations
- exposed-conductive-part Chap 2
- extension leads 4.3; 5.8; 15.10.1
 - cross-sectional areas Table 15.4
 - earth continuity resistance Table 15.1
 - maximum length Appx VII.3; Table 15.4
 - user checks Table 13.1
 - visual inspection Appx VII.3
- extra-low voltage: see nominal voltage

F

- fault, definition Chap 2
- fault protection Chap 2
- faulty equipment 8.5; 15.8
 - register Appx V.5
- fixed electrical installations Chap 4
- fixed equipment Chap 2
- fixed equipment/appliances 5.5
- flash testing: *see* dielectric strength testing
- flexible cables 15.12
 - definition Chap 2
 - length 4.3
 - resistances Appx VI.1
 - user checks Table 13.1
 - visual inspection Appx VII.2
 - see also* lead sets
- formal visual inspection Chap 14; 7.2; Table 7.1
 - frequency 7.4; Table 7.1
- forms: *see* documentation
- frequency of inspection and testing Chap 4; 7.3; 7.4
- functional checks 15.7
- functional switching 14.3.1
- fuses Appx VII.1
 - definition Chap 2
 - plug 15.13
 - ratings 14.1; 15.13
 - user checks 14.5

G

no entries

H

- hand-held appliances/equipment Chap 2; 5.3
 - frequency of inspection and testing 7.3
 - protective conductor/touch current test Table 15.3
- hazard, definition Chap 2
- hazardous locations 4.5; 14.2; Appx III.3
- Health and Safety at Work etc. Act 1974 3.1.1; 3.3; Appx II.1
- Health and Safety Executive: *see* HSE publications
- health and safety legislation Appx II
- heating appliances Table 15.2 n1; Table 15.3
- high protective conductor currents 15.11
- hi-pot testing: *see* dielectric strength testing
- hired equipment 16.3; Table 7.1 n6
- hotels Table 7.1; Table 7.1 n5,6
- houses in multiple occupation (HMO) 3.1.6
 - definition Chap 2
- Housing (Scotland) Act 2006 3.1.7
- Housing Act 2004 (England and Wales) 3.1.6
- Housing Health and Safety Rating System (HHSRS) 3.1.6
- HSE publications Appx IV.4
 - GS38: *Electrical test equipment for use by electricians* Chap 15; 10.1.3; Appx IV.3
 - HSR25: *Memorandum of Guidance on the Electricity at Work Regulations* 8.3; Appx IV.1

I

- IET Guidance Notes
 - 2: *Isolation & Switching* Appx VIII

- 3: *Inspection & Testing* Chap 4; Appx IV.3
- indirect contact Chap 2
- industrial equipment Table 7.1
- Ingress Protection (IP) code Chap 2
- inspection frequency Chap 4; 7.3
- inspections: see combined inspection and testing; formal visual inspection
- inspectors: see test operatives
- instructed person Chap 2
- insulation, definition Chap 2
- insulation-encased Class II 11.2
- insulation resistance testing 10.2; 10.4; 15.3; 15.5
- IT and similar equipment 15.5; Table 15.2 n3
- IP (Ingress Protection) code Chap 2
- isolating transformers 11.3
- isolation of installation Chap 2; Appx VIII
- for maintenance 14.3.2
- regulations Appx II.4.7; Appx III.7
- for testing Chap 15
- IT equipment 5.7
- disconnection for inspection 15.1
- earth continuity testing 15.4
- insulation resistance testing 15.5; Table 15.2 n3
- protective conductor/touch current test 15.6
- switching off for maintenance 14.3.2
- J**
- no entries
- K**
- kettles 15.6
- L**
- labelling 8.4
- damaged or faulty equipment 15.8; Appx V.3
- equipment with high protective conductor currents 15.11
- laptop computer power supply units (PSUs) 15.4; 15.5
- lead sets Chap 2; 15.9; 15.12
- earth continuity testing Table 15.1
- visual inspection Appx VII.2
- leakage current Chap 2
- leakage test 10.2; 10.4
- leased equipment 16.3
- legislation Chap 3; Appx II; Appx IV
- live part Chap 2
- live working Chap 15; Appx III.9
- locations of increased risk: see hazardous locations
- low voltage: see nominal voltage
- luminaires Chap 2; Table 13.1
- M**
- maintenance
- isolation and switching off 14.3.2
- regulations 3.1.5; 3.4; Appx II.4.2; Appx II.4.8
- Management of Health and Safety at Work Regulations 1999 3.1.2; Appx II.3
- managers' responsibilities 1.1.4; 9.3
- manufacturer's testing 6.2; 6.3
- means of earthing Chap 2; 4.1
- medical electrical equipment 1.2.1

metal-encased Class II	11.2; 11.2.7
mixed use locations	7.3
movable appliances/equipment	5.2
movable equipment	Chap 2
<i>see also</i> portable appliances/equipment	
multimeters	10.1.3
multiway adaptors	5.9; 15.10.3; Table 15.1
multiway extension leads	4.3; 15.10.1

N

new equipment/appliances	16.1
nominal voltage	Chap 2
non-flexible cables	Appx VII.2

O

offices	Table 7.1
ohmmeters	10.3
optical fibre systems	15.1
ordinary person, definition	Chap 2
outdoor equipment	4.2; 15.10.1

P

PAT (portable appliance test) instrument	Chap 2
personnel, responsibilities and training	Chap 9
petrol filling stations	4.5
phases	1.4
plug-in portable RCD devices	4.2
plugs	
formal visual inspection	14.5
fuses	15.13; Appx VII.1
user checks	Table 13.1
visual inspection	Appx VII.1
portable appliances/equipment	Chap 2; 5.1
protective conductor/touch current test	Table 15.3
used outdoors	4.2; 15.10.1
<i>see also</i> hand-held appliances/equipment	
portable appliance test (PAT) instruments	Chap 2; 10.2
portable RCD devices	4.2
premises	1.3
production testing (manufacturer's)	6.3
protective conductor current	Chap 2
protective conductor current test	10.2; 10.4; 15.3; 15.6
protective conductors	Chap 2
nominal resistances	Appx VI
protective earthing	11.1
<i>see also</i> earth continuity testing	
Provision and Use of Work Equipment Regulations (PUWER) 1998	3.1.3; 3.3; 3.4; Appx II.4
public used equipment	Table 7.1
children's rides	Table 7.1 n3
PUWER: <i>see</i> Provision and Use of Work Equipment Regulations (PUWER)	

Q

no entries

R

RCD (residual current device)	Chap 2
RCD adaptors	4.2; 5.9; 15.10.3

earth continuity resistance	Table 15.1
user checks	Table 13.1
RCD extension leads	5.8; 15.10.2
RCD-protected socket outlets	Table 15.5
RCD protection	4.2
record keeping: <i>see</i> documentation	
recurring damage	7.3; 7.4
register of equipment: <i>see</i> equipment registers	
reinforced insulation	Chap 2
Class I equipment	11.1
Class II equipment	11.2.2; 11.2.5; 11.2.7
repaired equipment, testing	6.5
repairers, training and experience	9.6
repair register	8.3; Appx V.4
residual current device: <i>see</i> RCD (residual current device)	
residual operating current	4.2
resilient plugs	Appx VII.1
resistances, protective conductors	Appx VI
responsibilities	3.3
for documentation	9.3
test supervisor's	Appx III.11.4
users	1.1.1; 8.6; 9.2
risk, definition	Chap 2
risk assessment	Chap 2; 7.1.1; Appx II.3; Appx II.4.3
rotating/moving machines	15.6

S

safety extra-low voltage: <i>see</i> SELV (separated extra-low voltage)	
safe working practices	Chap 15; Appx III.9–Appx III.11
<i>see also</i> health and safety legislation	
schools	Table 7.1; Table 7.1 n4,6
second-hand equipment/appliances	Chap 2; 16.1
separated extra-low voltage (SELV)	Chap 2; 11.3
shops	Table 7.1
skilled person	Chap 2
SMPS (switched mode power supply)	15.4; 15.5
socket-outlets	
definition	Chap 2
number	4.3
outdoors	4.2
RCD adaptors	4.2; 5.9
RCD-protected	Table 15.5
replacement	4.4
user checks	Table 13.1
'soft' test	10.2; 15.4; 15.6
soldering irons	15.13
SPD (surge protective devices)	Chap 2; 5.10; 15.5
standby power supplies	14.3.3
stationary equipment/appliances	Chap 2; 5.4
supervisor's responsibilities	Appx III.11.4
supplementary insulation	Chap 2
Class I equipment	11.1.3
Class II equipment	11.2.1; 11.2.4; 11.2.6
surge protective devices (SPD)	Chap 2; 5.10; 15.5
switched mode power supply (SMPS)	15.4; 15.5
switching of equipment	14.3
<i>see also</i> isolation of installation	

T

- telecommunications equipment, isolation 14.3.2; 15.1
- test equipment 8.2
- testing categories 7.2
- testing frequency Chap 4; 7.3
- testing sequence 15.3
- test instruments Chap 10
 - accuracy 10.3; 10.5
 - equipment registers 10.5; Appx V.6
- test lamps 10.1.3
- test lead resistance 10.3
- test leads 10.1.3
- test operatives Chap 15; 1.1.3
 - training and experience 9.5; Appx III.11
- test probes 10.1.3
- test records: *see* documentation
- test supervisor's responsibilities 9.3; Appx III.11.4
- thermocouple effects 10.3
- three-phase equipment 1.4; 10.2.1; Table 15.2 n5
- touch current Chap 2
- touch current test 10.2; 10.4; 15.3; 15.6
- training Chap 9; Appx II.4.6; Appx III.11
- transformers: *see* isolating transformers
- transient suppression devices Table 15.2 n6
- transportable equipment: *see* movable equipment

U

- unearthed metal Table 15.1 n5
 - Class I equipment 11.1.3; 11.1.4
 - Class II equipment 11.2.4; 11.2.5; 11.2.6; 11.2.7
- uninterruptible power supplies 14.3.3
- unlocated equipment 15.14
- user checks Chap 13; 6.4; 7.2
- user feedback 14.4
- user responsibilities 1.1.1; 8.6; 9.2
- user training 9.2; Appx II.4.6

V

- visual inspection Chap 14; Appx VII; 6.4; 7.2
 - frequency 7.4; Table 7.1
 - see also* user checks
- voltage, nominal Chap 2
- voltage indicators 10.1.3
- voltages 1.4
- voltmeters 10.1.3

W

- Waste Electronic and Electrical Equipment Regulations 2006 (WEEE directive) 3.1.9
- work equipment 3.1.3; Appx II.4.3
- Workplace (Health, Safety and Welfare) Regulations 1992 3.1.5

XYZ

- no entries