

Contents

Cooperating organisations	6
Acknowledgements	7
Preface	8
Introduction	9
Chapter 1 Statutory Regulations and The Wiring Regulations	11
1.1 Statutory Regulations	11
1.2 The Electricity at Work Regulations 1989 as amended	11
1.3 The Electricity Safety, Quality and Continuity Regulations 2002 as amended	12
1.4 The Building Regulations	14
1.5 The Construction (Design and Management) Regulations	15
Chapter 2 Electric shock and protective measures	17
2.1 Electric shock	17
2.2 Physiology of electric shock	17
2.3 Protective provisions and protective measures	18
Chapter 3 Provisions for basic protection	21
3.1 Introduction	21
3.2 Insulation	21
3.3 Barriers or enclosures	22
Chapter 4 Automatic disconnection of supply	25
4.1 The protective provisions	25
4.2 Definitions	25
4.3 Automatic disconnection of supply	26
4.4 TN system, requirements for disconnection	31
4.5 TT system, requirements for disconnection	33
4.6 IT systems	34
4.7 Functional extra-low voltage (FELV)	35
4.8 Reduced low voltage systems	36
4.9 Additional protection by residual current devices	38
4.10 Additional protection by supplementary equipotential bonding	38
4.11 Where automatic disconnection is not required for shock protection	38
4.12 Highway power supplies	39

Chapter 5	Double or reinforced insulation	41
5.1	The protective provisions	41
5.2	Effective supervision of installations and circuits	41
5.3	Circuit protective conductors	41
5.4	Equipment marking	42
5.5	Wiring systems	42
Chapter 6	Electrical separation	43
6.1	The protective provisions	43
6.2	Electrical separation applied to one item of equipment	44
6.3	Electrical separation for the supply to more than one item of current-using equipment	44
Chapter 7	Extra-low voltage provided by SELV or PELV	47
7.1	The protective provisions	47
7.2	ELV systems	48
7.3	SELV (separated extra-low voltage)	49
7.4	PELV (protective extra-low voltage)	50
7.5	Calculation of loop impedance in PELV (and FELV) circuits	50
7.6	SELV and PELV requirements in Part 7 of BS 7671	51
Chapter 8	Additional protection	53
8.1	The protective provisions	53
8.2	Additional protection by residual current devices (RCDs)	53
8.3	Additional protection by supplementary equipotential bonding	57
Chapter 9	Obstacles and placing out of reach	61
9.1	Scope of application	61
9.2	The protective provisions	61
9.3	Definitions	62
9.4	Obstacles	62
9.5	Placing out of reach	63
Chapter 10	Protective measures for application only where the installation is controlled or under the supervision of skilled or instructed persons	67
10.1	Protective measures and provisions	67
10.2	Non-conducting location	68
10.3	Earth-free local equipotential bonding	69
10.4	Electrical separation for the supply to more than one item of current-using equipment	70
Chapter 11	Earthing	73
11.1	Earthing systems	73
11.2	HV supplies	75
11.3	Earth electrodes	76

11.4	Earthing conductor	77
11.5	Main earthing terminal or bar	78
11.6	Functional earthing	79
Chapter 12 Circuit protective conductors		81
12.1	Introduction	81
12.2	Sizing of circuit protective conductors	81
12.3	Provision of circuit protective conductors	84
12.4	High protective conductor currents	85
Chapter 13 Protective equipotential bonding		89
13.1	Introduction	89
13.2	Main protective equipotential bonding	89
13.3	Supplementary equipotential bonding	93
13.4	Example of supplementary bonding	95
13.5	Extraneous-conductive-parts	96
Chapter 14 Protective multiple earthing		99
14.1	Introduction	99
14.2	Supply system	99
14.3	Potential difference within buildings	100
14.4	Potential difference outside buildings	100
14.5	Additional earth electrode for PME supplies	100
14.6	Special locations	101
Chapter 15 Special installations or locations		107
15.1	The increased risks	107
15.2	Regulation numbering	108
15.3	Supplementary and modified requirements	109
Appendix A Maximum permissible measured earth fault loop impedance		115
Appendix B Resistance of copper and aluminium conductors		119
Index		123