BS EN 50152-2:2012

BSI Standards Publication

Railway applications — Fixed installations — Particular requirements for alternating current switchgear

Part 2: Disconnectors, earthing switches and switches with nominal voltage above 1 kV

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 50152-2:2012. It supersedes BS EN 50152-2:2007 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/9/3, Railway Electrotechnical Applications - Fixed Equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 73000 9

ICS 29.120.40; 29.130.99; 29.280

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2012.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50152-2

November 2012

ICS 29.120.40; 29.280

Supersedes EN 50152-2:2007

English version

Railway applications - Fixed installations - Particular requirements for alternating current switchgear - Part 2: Disconnectors, earthing switches and switches with nominal voltage above 1 kV

Applications ferroviaires - Installations fixes - Spécifications particulières pour appareillage à courant alternatif - Partie 2: Sectionneurs, sectionneurs de terre et interrupteurs de tension nominale supérieure à 1 kV

Bahnanwendungen – Ortsfeste Anlagen - Besondere Anforderungen an Wechselstrom-Schalteinrichtungen – Teil 2: Trennschalter, Erdungsschalter und Lastschalter mit einer Nennspannung größer als 1 kV

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50152-2:2012 E

Contents

Page

Foreword 3
Introduction 4
1 Scope 5
2 Normative references 5
3 Terms and definitions 5
4 Normal and special service conditions [2] 7
5 Rating [4] 7
5.1 General 7
5.2 Nominal voltage (U_n) 7
5.3 Rated voltage (U_{Ne}) [4.1] 7
5.4 Insulation coordination 7
5.5 Rated frequency [4.3] 8
5.6 Rated supply voltage of closing and opening devices and of auxiliary and control circuits (U_a) [4.8] 8
5.7 Rated making and breaking current 8
5.8 Rated values for mechanical endurance [102: 4.106] 9
6 Design and construction [5] 9
6.1 General 9
6.2 Combined switching devices 9
7 Type tests [6] 10
7.1 General 10
7.2 Dielectric tests [6.2] 10
7.3 Electromagnetic compatibility tests (EMC) [6.9] 10
7.4 Making and breaking tests [103: 6.101] 10
7.5 Operating and mechanical endurance test [6.102] 10
8 Routine tests [7] 11
9 Guide to the selection of switching devices for service [8] 11
10 Information to be given with inquiries, tenders and orders [9] 11
11 Rules for transport, storage, erection, operation and maintenance [10] 11
12 Safety [11] 11
13 Influence of the product on the environment [12] 12
Bibliography 13

Tables

Table 1 — Nominal voltages (U_n), rated impulse voltages (U_{Ni}) and short-duration power-frequency withstand voltage (U_d) for circuits connected to the contact line 8
Table 2 — Mechanical endurance classes and recommended use 9

Foreword

This document (EN 50152-2:2012) has been prepared by CLC/SC 9XC "Electric supply and earthing systems for public transport equipment and ancillary apparatus (Fixed installations)".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-10-15
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-10-15

This document supersedes EN 50152-2:2007.

EN 50152-2:2012 includes the following significant technical changes with respect to EN 50152-2:2007:

This standard was revised to reflect the latest versions of standards referenced and to remove text already included in the EN 62271 series. The scope was extended to include single-phase and two-phase devices. Definitions were added to provide the necessary precision and to meet the needs of railway applications. Table 1 was reworked according to the changes of EN 50124-1:2001, Table A.2 and Table B.1. Table 2 'Coordination table of rated values for devices' of the previous version was removed. Ratings previously given under the clause 'type tests' were moved to the new Table 2 'Mechanical endurance classes and recommended use'.

EN 50152 series under the generic title *Railway applications — Fixed installations — Particular requirements for alternating current switchgear* is divided as follows:

- *Part 1: Circuit-breakers with nominal voltage above 1 kV*;

- *Part 2: Disconnectors, earthing switches and switches with nominal voltage above 1 kV*;

- *Part 3-1: Measurement, control and protection devices for specific use in a.c. traction systems — Application guide*;

- *Part 3-2: Measurement, control and protection devices for specific use in a.c. traction systems — Single-phase current transformers*;

- *Part 3-3: Measurement, control and protection devices for specific use in a.c. traction systems — Single-phase inductive voltage transformers*.

Introduction

This standard needs to be read in conjunction with EN 62271-1:2008, EN 62271-102:2002 and/or EN 62271-103:2011, depending on the equipment involved.

References in subclauses in EN 62271-102 need to be to EN 62271-1 instead of EN 60694.

Where a particular clause of EN 62271-1, EN 62271-102 or EN 62271-103 is not mentioned in this standard, that clause applies as far as reasonable. Where requirements relate exclusively to three-phase systems or to voltages outside those in use in traction systems, they are not applicable. Where this standard states "addition" or "replacement", the relevant text of EN 62271-1, EN 62271-102 and EN 62271-103 needs to be adapted accordingly. When a clause is named applicable to both EN 62271-102 or EN 62271-103, then reference needs to be made only to the standard appropriate for the respective switching device.

The numbering of clauses in EN 62271 series is not used in this European Standard. The numbering in square brackets refers to the numbering of clauses in EN 62271 series. References specific to numbering of clauses in EN 62271-102 have the prefix ‘102.' and specific to EN 62271-103 have the prefix ‘103.'.

Where terms defined in EN 62271 series conflict with definitions of same terms as given in IEC 60050-811:1991, or the other railway applications documents listed in the normative references, the definitions in EN 62271-1, EN 62271-102 and EN 62271-103 need to be used.

NOTE 1 The clause numbering in EN 62271-102 and EN 62271-103 is the same as in EN 62271-1. Additional requirements specific to the type of switching device start with subclause numbers from 100.

NOTE 2 The suffix N which appears in this standard for rated values is not used in EN 62271 series.

1 Scope

This European Standard is applicable to single-pole and two-pole alternating current (a.c.) disconnectors, earthing switches and switches which are:

— designed for indoor or outdoor fixed installations in tractions systems, and

— operated with an a.c. line voltage and frequency as specified in EN 50163.

NOTE 1 EN 50163 specifies the a.c. traction systems 15 kV 16,7 Hz and 25 kV 50 Hz.

NOTE 2 As rails of a.c. traction systems are connected to earth and included in the return current path all phase to earth voltages will be within the tolerances as specified in EN 50163. Nevertheless phase to phase voltages are sometimes higher, e.g. in autotransformer systems.

NOTE 3 The two poles of a switch can be connected in series to provide secure isolation (i.e. two breaks in series).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50121-5, *Railway applications — Electromagnetic compatibility — Part 5: Emission and immunity of fixed power supply installations and apparatus*

EN 50124-1:2001, *Railway applications — Insulation coordination — Part 1: Basic requirements — Clearances and creepage distances for all electrical and electronic equipment*

EN 50152-1:2012, *Railway applications — Fixed installations — Particular requirements for alternating current switchgear — Part 1: Circuit breakers with nominal voltage above 1 kV*

EN 50163:2004, *Railway applications — Supply voltages of traction systems*

EN 62271-1:2008, *High-voltage switchgear and controlgear — Part 1: Common specifications (IEC 62271-1:2007)*

EN 62271-102:2002*, High-voltage switchgear and controlgear — Part 102: Alternating current disconnectors and earthing switches (IEC 62271-102:2001 + corrigendum Apr. 2002 + corrigendum May 2003)*

EN 62271-103:2011, *High voltage switchgear and controlgear — Part 103: Switches for rated voltages above 1 kV up to and including 52 kV (IEC 62271-103:2011)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 62271-1:2008, EN 62271-102:2002, EN 62271-103:2011 and the following apply.

3.1
switching device
general term covering disconnectors, earthing switches and switches

Note 1 to entry: This definition of ‘switching device’ is limited to this standard. There may be different or more comprising use in other parts of the EN 50152 and EN 62271 series (e.g. in EN 62271-1:2008, 3.1.1).

3.2
single-pole switching device
switching device with one electrically separated conducting path for the main circuit suitable for use in a single-phase circuit

3.3
two-pole switching device
switching device with two independent electrically separated conducting paths for the main circuit

Note 1 to entry: The two paths may be connected in series for use in a single-phase circuit where the establishment of the two paths is simultaneous.

Note 2 to entry: This device may be used to interrupt or establish simultaneously a single-phase circuit in two different points.

3.4
combined switching device
switching device where the main circuit of the switching device, the operating link and operating drive may be used in combination with those from different manufacturers

Note 1 to entry: This is common practice in some countries especially for mast switches.

3.5
nominal voltage (U_n)
suitable approximate voltage value used to designate or identify a given supply system

[SOURCE: EN 50124-1:2001, 1.3.2.1]

Note 1 to entry: This value is also assigned to the switching device to show its usability in the supply system.

Note 2 to entry: An AT-System which is supplied with 2 phases, having a phase shift of 180° between them, is commonly named 2 x U_n according to the U_n supplied to the catenary system.

3.6
rated voltage
U_{Ne}
value of voltage assigned by the manufacturer to the equipment or part of it and to which operating and performance characteristics are referred

[SOURCE: EN 50124-1:2001, 1.3.2.3, modified]

Note 1 to entry: This value is also used to determine its dielectric characteristics and will be used instead of the rated insulation voltage (U_{Nm}) as defined and used in EN 50124-1:2001.

Note 2 to entry: The abbreviation U_r is not used for railway switching devices.

3.7
Over Voltage category
OV
classification of the circuit protection against internal and external overvoltages

3.8
Pollution Degree
PD
classification of the pollution to be considered due to the micro climate

3.9
line
general term covering the catenary and bare feeder conductors in fixed installations

Note 1 to entry: This definition is added as line is understood in most cases as HV transmission line.

3.10
index of definitions
same as in 3.8 of EN 62271-103:2011, but amended according to the definitions above and those of EN 62271-102:2002, Clause 3.

4 Normal and special service conditions [2]

Clause 2 of EN 62271-1:2008 is applicable except as follows:

The minimum ambient air temperature under normal service conditions for indoor switching devices shall be -5 °C.

For special service conditions, agreement shall be made between purchaser and supplier. EN 50125-2 should be taken as a guidance to select appropriate classifications.

NOTE The altitude reference of EN 50124-1 (up to 2 000 m) applies to insulation coordination only and is not considered in this standard.

5 Rating [4]

5.1 General

Clause 4 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as noted in 5.2-5.8 below.

5.2 Nominal voltage (U_n)

The standard values of nominal voltage U_n are 15 kV and 25 kV as listed in Table 1 of EN 50163:2004.

5.3 Rated voltage (U_{Ne}) [4.1]

Subclause 4.1 of EN 62271-1:2008 is replaced by the following:

The rated voltage U_{Ne} shall be chosen taking into consideration the maximum voltage level suitable to be permanently applied to the switching device (i.e. highest permanent voltage U_{max1} as defined in EN 50163:2004).

The value of U_{Ne} shall be used whenever EN 62271-1, EN 62271-102 or EN 62271-103 reference to U_r unless another value is named explicitly.

NOTE 1 The insulation characteristics determined by applying U_{max1} are expected to be suitable to allow the highest non-permanent voltage U_{max2} taken from EN 50163:2004.

NOTE 2 The rated voltage for fixed installations in railway applications is a phase to earth value.

5.4 Insulation coordination

5.4.1 General

Insulation coordination shall be conducted according to EN 50124-1 e.g. selection of values for overvoltage category (OV) and pollution degree (PD).

The rated voltage U_{Ne} shall be used when EN 50124-1 refers to the rated insulation voltage U_{Nm}.

The definition of the four overvoltage categories shall be as in EN 50124-1:2001, 2.2.2.1.

The definition of the seven pollution degrees shall be as in EN 50124-1:2001, 2.5 and Table A.4.

5.4.2 Rated insulation level [4.2]

Subclause 4.2 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as follows:

The values of the rated impulse withstand voltage U_{Ni} and of the power-frequency withstand voltage U_d shall be as given in Table 1, taken from the values listed in EN 50124-1:2001.

Table 1 — Nominal voltages (U_n), rated impulse voltages (U_{Ni}) and short-duration power-frequency withstand voltage (U_d) for circuits connected to the contact line

U_n kV	U_{Ne} kV	OV	Common value		Across the isolating distance	
			U_{Ni} kV	U_d kV	U_{Ni} kV	U_d kV
15	17,25	3 [a]	95	38	110	50
		4	125	50	145	60
	17,25 [b]	3 [a]	145	70	165	80
		4	170	70	195	95
25	27,5	3	170	70	200	95
		4	200	95	220	110
	27,5 [b]	3	200	95	220	110
		4	250	95	290	110

NOTE The rated short-duration power-frequency withstand voltage is represented by U_d as used in EN 62271-1 not by U_a as used in EN 50124-1:2001. U_a is used in EN 62271-1 for the rated auxiliary voltage.

[a] Not commonly used.

[b] For higher requirements on insulation system.
This is common practice in some countries with larger number of installations at altitude up to 2 000 m without additionally applying an altitude correction factor.

All test voltages for dielectric tests on the main circuit shall be taken from Table 1.

5.5 Rated frequency [4.3]

Subclause 4.3 of EN 62271-1:2008 is replaced by the following:

The standard values of the rated frequency are 16,7 Hz and 50 Hz as listed in Table 1 of EN 50163:2004.

5.6 Rated supply voltage of closing and opening devices and of auxiliary and control circuits (U_a) [4.8]

Subclause 4.8 of EN 62271-1:2008 is applicable with the following addition.

The relative tolerance as specified in 4.8.3 of EN 62271-1:2008 does not apply to a.c. power supplies fed from a transformer connected to the traction line voltage. This tolerance shall be agreed upon between purchaser and supplier.

NOTE In this case the relative tolerance of 4.8.3 of EN 62271-1:2008 will not be sufficient due to the high fluctuation of the traction line voltage.

5.7 Rated making and breaking current

Subclauses 4.101 of EN 62271-102:2002 is applicable for earthing switches.

Subclauses 4.101 to 4.115 of EN 62271-103:2011 are applicable for switches except as follows.

A switch shall be classified either general purpose switch, limited purpose switch or special purpose switch according to the requirements of 4.113 to 4.115 of EN 62271-103:2011.

Switch-disconnectors shall comply with the requirements for switches and also for disconnectors.

It is recommended that the rated capacitive line charging current and the rated capacitive cable charging current do not exceed 2 A for 16,7 Hz and 10 A for 50 Hz.

NOTE Such capacitive current equals a circuit of around 2,5 km of typical cable or 100 km of typical line.

When breaking of higher capacitive currents is required, switches shall be suitable to switch a capacitor bank. Rated capacitive switching currents shall be agreed between purchaser and supplier.

5.8 Rated values for mechanical endurance [102: 4.106]

Subclause 4.106 of EN 62271-102:2002 is applicable for all switching devices except as follows.

Values for mechanical endurance classes of switching devices shall be as given in Table 2:

Table 2 — Mechanical endurance classes and recommended use

Mechanical endurance class	Operating cycles	Recommended for
Class 1	1 000	earthing switches
Class 2	3 000	disconnectors
Class 3	10 000	switches
NOTE Each operating cycle consists of one OPEN and one CLOSE operation.		

6 Design and construction [5]

6.1 General

Clause 5 of EN 62271-102:2002 and EN 62271-103:2011 is applicable, except as follows:

For switches with a breaking medium such as gas, the effective pressure of this gas at 20 °C shall not exceed 1,5 x 10^5 Pa (in addition to the atmospheric pressure of 10^5 Pa).

6.2 Combined switching devices

The manufacturer of combined switching devices or their components shall state:

— for the main circuit: the maximum operating force and related travel required to operate the device

— for the operating link: the maximum force it can transfer

— for operating drives: the minimum operating force and related travel provided by the drive.

The manufacturer of a component shall state the operating conditions which are covered by these data, e.g thickness of ice coating and contact opening or closing.

The party responsible for installation of an operating link shall consider the maximum force required to operate the link the maximum length and number of intermediate supports required, and the maximum loss of travel within the link.

Combined switching device are typically push-pull operated therefore force and travel are named. If the combined switching device uses a rotational operation then the torque shall be provided instead of the force and the rotational angle instead of the travel.

When selecting components for a combined switching device the possible operating conditions of the specific application need to be considered, e.g.

— environmental conditions, particularly ice conditions;

— physical arrangement of the individual components and distance between them;

— wear over the life time.

NOTE Due to the large number of installation conditions and combinations it is not possible to provide a fixed guidance.

7 Type tests [6]

7.1 General

Clause 6 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as in 7.2-7.5 below.

7.2 Dielectric tests [6.2]

Subclause 6.2 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as follows:

For dielectric tests the values given in Table 1 shall apply.

7.3 Electromagnetic compatibility tests (EMC) [6.9]

Subclause 6.9 of EN 62271-1:2008 is applicable except as follows:

Emission and immunity levels shall be taken from EN 50121-5.

7.4 Making and breaking tests [103: 6.101]

Subclause 6.101 of EN 62271-103:2011 is applicable except as follows:

These tests shall be performed at rated voltage U_{Ne} and rated frequency f_r.

The resulting breaking current shall be tested in accordance with the requirements of EN 50152-1:2012, 6.101 of EN 62271-103:2011.

7.5 Operating and mechanical endurance test [6.102]

7.5.1 General

Subclause 6.102 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as follows

The mechanical endurance test shall consist of operating cycles as assigned to the switching device and as given in Table 2.

Subclause 6.102.5 of EN 62271-102:2002 is applicable also for earthing switches assigned class 2 or class 3.

7.5.2 Endurance tests of combined switching devices

The requirements for mechanical endurance tests and extended mechanical endurance tests of 6.102 of EN 62271-102:2002 and EN 62271-103:2011 are amended by the following:

The endurance test, mechanical endurance and extended mechanical endurance, of combined switching devices shall be performed on a typical combination. Components shall be tested at least in one typical combination.

If applicable the majority of operations of the endurance test shall be carried out with that pair of force and travel of the operating drive providing the highest product of travel multiplied by force. Each series of 1 000 operations shall include a minimum of 100 operations for each pair of force and travel combination being specified.

The number of operating cycles at the specified minimum supply voltage and/or minimum pressure of compressed gas supply shall be shared equally if more than one pair of force and travel combination is specified. There shall be a minimum of 20 operations for each pair.

NOTE: In most cases operators and manufactures have agreed upon one specific travel for their combined switching devices.

8 Routine tests [7]

Clause 7 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as follows:

Voltage reference in dielectric tests shall be made to the values given in Table 1.

NOTE 1 Subclauses 7.1 to 7.4 of EN 62271-102:2002 and of EN 62271-103:2011 only contain cross references to EN 62271-1.

NOTE 2 Subclauses 7.101 of EN 62271-102:2002 requires an on-site mechanical operations test for equipment having routine tests on separate components only. For the number of operating cycles it references to 6.102.3.2 of EN 62271-102:2002.

This conforms with the requirement of on-site routine tests for disconnectors used in overhead catenary systems according to 8.12 of EN 50119:2009.

9 Guide to the selection of switching devices for service [8]

Clause 8 of EN 62271-102:2002 and EN 62271-103:2011 is applicable except as follows:

Definitions and ratings of this standard prevail.

10 Information to be given with inquiries, tenders and orders [9]

Clause 9 of EN 62271-102:2002 and EN 62271-103:2011 is applicable.

11 Rules for transport, storage, erection, operation and maintenance [10]

Clause 10 of EN 62271-102:2002 and EN 62271-103:2011 is applicable.

12 Safety [11]

Clause 11 of EN 62271-1:2008 is applicable.

13 Influence of the product on the environment [12]

Clause 12 of EN 62271-1:2008 is applicable.

Bibliography

EN 50119:2009, *Railway applications — Fixed installations — Electric traction overhead contact lines*

EN 50121 (all parts), *Railway applications — Electromagnetic compatibility*

EN 50122-1:2011, *Railway applications — Fixed installations — Part 1: Protective provisions relating to electrical safety and earthing*

EN 50124-2:2001, *Railway applications — Insulation coordination — Part 2: Overvoltages and related protection*

EN 50125-2:2002, *Railway applications — Environmental conditions for equipment — Part 2: Fixed electrical installations*

EN 50126 (all parts), *Railway applications — The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)*

EN 60044-1, *Instrument transformers — Part 1: Current transformers (IEC 60044-1)*

EN 60060-1, *High-voltage test techniques — Part 1: General definitions and test requirements (IEC 60060-1)*

EN 60085, *Electrical Insulation — Thermal evaluation and designation (IEC 60085)*

EN 60137, *Insulated bushings for alternating voltages above 1000 V (IEC 60137)*

EN 60270, *High-voltage test techniques — Partial discharge measurements (IEC 60270)*

EN 60296, *Fluids for electrotechnical applications — Unused mineral insulating oils for transformers and switchgear (IEC 60296)*

EN 60376, *Specification of technical grade sulphur hexafluoride (SF6) for use in electrical equipment (IEC 60376)*

EN 60470, *High-voltage alternating current contactors and contactor-based motorstarters (IEC 60470)*

EN 60507:1993, *Artificial pollution tests on high voltage insulators to be used in a.c. systems (IEC 60507:1991)*

EN 60721 (all parts), *Classification of environmental conditions (IEC 60721, all parts)*

EN 61000 (all parts), *Electromagnetic compatibility (EMC) (IEC 61000, all parts)*

EN 62271-100:2009, *High-voltage switchgear and controlgear — Part 100: Alternating-current circuit-breakers (IEC 62271-100:2008)*

EN 62271-200, *High-voltage switchgear and controlgear — Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV (IEC 62271-200)*

IEC 60050-151, *International Electrotechnical Vocabulary (IEV) — Part 151: Electrical and magnetic devices*

IEC 60050-441, *International Electrotechnical Vocabulary (IEV) — Chapter 441: Switchgear, controlgear and fuses*

IEC 60050-446, *International Electrotechnical Vocabulary (IEV) — Chapter 446: Electrical relays*

IEC 60050-604, *International Electrotechnical Vocabulary (IEV) — Chapter 604: Generation, transmission and distribution of electricity — Operation*

IEC 60050-605, *International Electrotechnical Vocabulary (IEV) — Chapter 605: Generation, transmission and distribution of electricity — Substations*

IEC 60050-811:1991, *International Electrotechnical Vocabulary (IEV) — Chapter 811: Electric traction*

IEC/TS 60815 (all parts), *Selection and dimensioning of insulators intended for use in polluted conditions*

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™