



DPC: 25/30511085 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 27 June 2025

Origin: International

Latest date for receipt of comments: 23 July 2025

Project No. 2025/00751

Responsible committee: PEL/22 Power electronics

Interested committees:

Title: Draft BS EN IEC 62310-1 Static transfer systems (STS). Part 1: General and safety requirements.

Please notify admin.start@bsigroup.com if you are aware of any keywords that might assist in clarifying or identifying the standard or of the content of this standard:

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 23 July 2025

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.

Information on the co-operating organizations represented on the committees referenced above may be obtained from <https://standardsdevelopment.bsigroup.com/>.

E-mail: admin.start@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



22H/340/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

IEC 62310-1 ED2

DATE OF CIRCULATION:

2025-06-27

CLOSING DATE FOR COMMENTS:

2025-08-22

SUPERSEDES DOCUMENTS:

22H/333/RR

IEC SC 22H : UNINTERRUPTIBLE POWER SYSTEMS (UPS)

SECRETARIAT:

France

SECRETARY:

Mr Miao-Xin WANG

OF INTEREST TO THE FOLLOWING COMMITTEES:

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

Safety

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Static transfer systems (STS) - Part 1: General and safety requirements

NOTE FROM TC/SC OFFICERS:

Please find the 2CD.

Copyright © 2025 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part or item, for any other purpose without permission in writing from IEC.

CONTENTS

1		
2	FOREWORD.....	4
3	INTRODUCTION.....	7
4	1 Scope.....	8
5	2 Normative references	8
6	3 Terms and definitions	9
7	3.36 low voltage	12
8	3.37 mains supply.....	12
9	3.40 non-mains supply.....	12
10	3.82 working voltage.....	12
11	3.101 backfeed.....	12
12	3.102 backfeed protection	12
13	3.103 let-through current	13
14	3.104 objectionable current	13
15	3.105 static transfer system.....	13
16	4 Protection against hazards	13
17	4.3 Short-circuit and overload protection.....	13
18	4.3.2 Input and output short-circuit withstand strength.....	13
19	4.4 Protection against electric shock.....	13
20	4.4.8 Compatibility with residual current-operated protective devices (RCD).....	15
21	4.4.9 Capacitor discharge.....	15
22	4.8 STS with multiple sources of supply.....	15
23	4.9 Protection against environmental stresses	15
24	4.10 Protection against excessive acoustic noise hazards	16
25	4.101 Backfeed protection	16
26	4.102 AC power isolation.....	16
27	5 Test requirements.....	17
28	5.1.7 Test overview	17
29	5.2.3 Electrical tests.....	19
30	5.2.4 <i>Abnormal operation</i> and simulated faults tests	20
31	6 Information and marking requirements.....	23
32	6.1 General.....	23
33	6.2 Information for installation and commissioning	24
34	6.4 Information for intended use	24
35	6.4.101 Backfeed labeling	24
36	6.5 Supplementary information	25
37	6.5.5 STS with multiple sources of supply.....	25
38	Annex A (informative) Clearance and creepage comparison with IEC 62310-1 Edition	
39	1.....	27
40	Annex B (informative) Neutral management in static transfer systems	28
41	B.1 General.....	28
42	B.2 Independent grounding point for all AC mains supplies – Common neutral.....	28
43	B.3 Independent grounding point for all AC mains supplies – Switched neutral	28
44	Bibliography.....	30

46	Figure BB.1 – Common <i>STS</i> neutral – Objectionable current flow – Independent	
47	grounding of AC mains supplies	28
48	Figure BB.2 – Switched <i>STS</i> neutral – Objectionable current flow – Independent	
49	grounding of AC mains supplies	29
50		
51	Table 1 – Alphabetical list of terms	10
52	Table 101 – Overvoltage categories	14
53	Table 23 – Test overview	17
54	Table 32 – AC <i>short-time withstand current</i> test, minimum <i>STS</i> requirements	22
55	Table 40 – Marking location	23
56		
57		

INTERNATIONAL ELECTROTECHNICAL COMMISSION

STATIC TRANSFER SYSTEMS (STS) -

Part 1: General and safety requirements

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62310-1 has been prepared by subcommittee 22H: Uninterruptible Power Systems, of IEC technical committee 22: Power electronic systems and equipment. It is an International Standard.

This 2.0 edition cancels and replaces the 1.0 edition published in march 2005. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the reference document has been changed from IEC 60950-1:2005 (Information technology equipment – Safety – Part 1: General requirements) to IEC 62477-1:2022 (Safety requirements for power electronic converter systems and equipment – Part 1: General);
- b) addition of Table 101, minimum overvoltage categories in 4.4.7.1.4;
- c) add line-to-line voltage for components bridging insulation in 4.4.7.1.8;
- d) compatibility with residual current operated protective devices (RCD) and expanded requirement for 4 poles STS in 4.4.8;
- e) STS with multiple sources of supply in 4.8;
- f) protection against environmental stresses and minimum requirement of environmental service condition of 3K2 as a minimum in 4.9;
- g) *short-time withstand current* test method, test is not repeated when both inputs are identical in 5.2.4.4.3.2;
- h) clearance and creepage comparison from Edition 1 to Edition 2 in Annex A, the method of evaluation has been updated.

The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

The exceptions are then listed.

- The exceptions can take the form of a deletion, a replacement or an addition of subclauses, tables, figures or annexes.
- Subclauses, tables and figures that are additional to those of IEC 62477-1:2022 are, in this document, identified by a suffix in the format of X.10x, for example 4.3.101.
- Annexes that are additional to those of IEC 62477-1:2022 are, in this document, lettered AA, BB, etc.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, and ISO/IEC Directives, IEC Supplement available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all the parts in the IEC 62477 series, published under the general title Safety requirements for power electronic convertor systems and equipment can be found on the IEC website.

A list of all the parts in the IEC 62310 series, published under the general title Static transfer systems (STS) can be found on the IEC website.

In this document, terms in *italic* are defined in Clause **Error! Reference source not found..**

NOTE Due to the requirement in ISO/IEC directive part 2 the defined term is in singular. In this document also the plural is in bold.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC technical sub-committee 22H: Uninterruptible Power Systems (UPS) carefully considered the relevance of each paragraph of IEC 62477-1:2022 in static transfer systems (STS) applications. This part of IEC 62310 utilizes IEC 62477-1:2022 as a reference document (RD). It adds, replaces or modifies requirements as relevant. This is because product-specific topics not covered by the reference document are the responsibility of the technical committee using the reference document.

IEC 62477-1:2022 relates to products that include power electronic converters, with a rated system voltage not exceeding 1 000 V AC or 1 500 V DC. It specifies requirements to reduce risks of fire, electric shock, thermal, energy and mechanical hazards, except functional safety as defined in all parts of IEC 61508 series. The objectives of this document are to establish a common terminology and basis for the safety requirements of products that contain power electronic converters across several IEC technical committees.

IEC 62477-1:2022 has been developed with the intention

- to be used as a reference document for product committees inside TC 22 in the development of product standards for power electronic converter systems and equipment,
- to replace IEC 62103 as a product family standard providing minimum requirements for safety aspects of power electronic converter systems and equipment in apparatus for which no product standard exists, and

NOTE The scope of IEC 62103 contains reliability and electromagnetic compatibility aspects, which are not covered by this document.

- to be used as a reference document for product committees outside TC 22 in the development of product standards of power electronic converter systems and equipment intended renewable energy sources. TC 82, TC 88, TC 105, TC 114 and TC 121, in particular, have been identified as relevant technical committees at the time of publication.

The reference document IEC 62477-1:2022, being a group safety standard, will not take precedence over this product-specific standard according to IEC Guide 104. IEC Guide 104 provides information about the responsibility of product committees to use group safety standards for the development of their own product standards.

STATIC TRANSFER SYSTEMS (STS) -

Part 1: General and safety requirements

1 Scope

This part of IEC 62310 applies to movable, stationary, fixed, *open type* or built-in STS for use in low voltage distribution systems and that are intended to be installed in an area accessible by an *ordinary person* or in a restricted access area as applicable. STS is intended to operate on fixed frequency, single phase or multi-phase system, with rated voltage not exceeding 1 000 V AC. It applies to pluggable and to permanently connected STS, whether consisting of a system of interconnected units or of independent units, subject to installing, operating and maintaining the STS in the manner prescribed by the manufacturer.

This document specifies requirements to ensure safety for the *ordinary person* who comes into contact with the STS and, where specifically stated, for the *skilled person*. The objective is to reduce risks of fire, electric shock, thermal, energy and mechanical hazards during use and operation and, where specifically stated, during service and maintenance.

This part of IEC 62310 includes requirements for the switching elements, their control and protective elements, where applicable. This part of IEC 62310 also includes information for the overall integration of the STS and its accessories into the low voltage AC power distribution system.

Components or devices necessary for the operation, control, protection and isolation (e.g. circuit breakers, fuses, transformers, relays, etc.) of an STS should comply with the requirements of the relevant IEC standards and are not covered by this part of IEC 62310.

This document is harmonized with the applicable parts of group safety publication IEC 62477-1:2022 for power electronic converter systems and contains additional requirements relevant to STS.

This document does not apply to:

- devices for DC source switching
- transfer switching equipment (TSE) covered by IEC 60947-6-1
- the automatic switching devices integrated into UPS covered by IEC 62040 series

NOTE For STS intended to be used in vehicles, onboard ships or aircraft, in tropical countries, for emergency power systems (such as those used for health care facilities, fire fighting, emergency rescue, etc.) different requirements may be necessary.

2 Normative references

Clause 2 of IEC 62477-1:2022 applies, except as follows:

Add the following normative references:

IEC 62310-2, *static transfer systems (STS) - Part 2: Electromagnetic compatibility (EMC) requirements*

229 **3 Terms and definitions**

230 Clause 3 of IEC 62477-1:2022 applies, except as follows:

231 *Replace table 1 of IEC 62477-1:2022 with the following table:*