



# INTERNATIONAL STANDARD

AMENDMENT 1

**Utility connections in port –  
Part 1: High voltage shore connection (HVSC) systems – General requirements**

IECNORM.COM : Click to view the full PDF of IEC/IEEE 80005-1:2019/Amd 1:2022





## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2022 IEC/ISO/IEEE

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from IEC, ISO or IEEE at the respective address given below.

IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland  
Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

ISO copyright office  
Case postale 56  
CH-1211 Geneva 20  
Switzerland  
Tel.: +41 22 749 01 11  
[copyright@iso.org](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)

Institute of Electrical and Electronics Engineers, Inc.  
3 Park Avenue  
New York, NY 10016-5997  
United States of America  
[stds.info@ieee.org](mailto:stds.info@ieee.org)  
[www.ieee.org](http://www.ieee.org)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

#### IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IECNORM.COM : Click to view the full PDF of IEC 60055-1:2019/AMD 1:2022



# INTERNATIONAL STANDARD

AMENDMENT 1

Utility connections in port –  
Part 1: High voltage shore connection (HVSC) systems – General requirements

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 47.020.60

ISBN 978-2-8322-1057-2

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## UTILITY CONNECTIONS IN PORT –

**Part 1: High voltage shore connection (HVSC) systems –  
General 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 nongovernmental organizations liaising with the IEC also participate in this preparation.

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

IEEE Standards documents are developed within IEEE Societies and Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of IEEE and serve without compensation. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards. Use of IEEE Standards documents is wholly voluntary. IEEE documents are made available for use subject to important notices and legal disclaimers (see <http://standards.ieee.org/IPR/disclaimers.html> for more information).

IEC collaborates closely with ISO and IEEE in accordance with conditions determined by agreement between the organizations. This Triple Logo International Standard was jointly developed by the IEC, ISO and IEEE under the terms of that agreement.

- 2) The formal decisions 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. In the ISO, Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote. The formal decisions of IEEE on technical matters, once consensus within IEEE Societies and Standards Coordinating Committees has been reached, is determined by a balanced ballot of materially interested parties who indicate interest in reviewing the proposed standard. Final approval of the IEEE Standard document is given by the IEEE Standards Association (IEEE SA) Standards Board.
- 3) IEC/ISO/IEEE Publications have the form of recommendations for international use and are accepted by IEC National Committees/ISO member bodies /IEEE Societies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC/ISO/IEEE Publications is accurate, IEC, ISO or IEEE 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 (including IEC/ISO/IEEE Publications) transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC/ISO/IEEE Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC, ISO, and IEEE do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC, ISO and IEEE are 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, ISO or IEEE or their directors, employees, servants or agents including individual experts and members of technical committees and IEC National Committees and ISO member bodies, or volunteers of IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE SA) Standards Board, 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/ISO/IEEE Publication or any other IEC, ISO or IEEE 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) Attention is drawn to the possibility that implementation of this IEC/ISO/IEEE Publication may require use of material covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. IEC, ISO or IEEE shall not be held responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patent Claims or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from ISO or the IEEE Standards Association.

This amendment has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units, in cooperation with

- IEC subcommittee 23H: Plugs, socket-outlets and couplers for industrial and similar applications, and for electric vehicles, of IEC technical committee 23: Electrical accessories,
- ISO subcommittee 3: Piping and machinery, of ISO technical committee 8: Ships and marine technology, and
- IEEE IAS Petroleum and chemical industry committee.

This document is published as a triple logo (IEC, ISO and IEEE) standard.

The text of this amendment is based on the following documents:

Draft	Report on voting
18/1737/FDIS	18/1754/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table. In ISO, the amendment has been approved by 10 P members out of 10 having cast a vote.

The language used for the development of this Amendment is English.

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, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

---

## 2 Normative references

Add, after the existing reference IEC/IEEE 80005-2, the following new reference:

IEEE Std C37.20.2™, *Standard for Metal-Clad Switchgear*

### 4.8 System study and calculations

Add, after c) 3), the following new note:

NOTE Provisional load restrictions can be necessary during load transfer.

### 5.1 Voltages and frequencies

Replace the existing fourth paragraph with the following new paragraph:

The phase sequence shall be L1-L2-L3 or A-B-C or R-S-T, anticlockwise. A phase sequence indicator shall indicate correct sequence prior to energizing or paralleling HVSC – see Figure 2 a). Figure 2 b) illustrates the balanced three-phase voltages in the time domain.

Add, after the existing fifth paragraph, the following new note:

NOTE See ship specific annexes for phase assignment of the pins in the connector.

### 5.2 Quality of HV shore supply

Delete, in item c) of the existing second paragraph, the last sentence.

### Figure 3 – Single harmonic distortion limits

Delete the existing figure, including its title.

Replace, after Figure 3, the existing note with the following new note:

NOTE Additional recommendations are provided in IEEE Std 519™, MIL STD 1399-680, and IEC 60092-101.

#### 6.2.1 Circuit-breaker, disconnect and earthing switch

Replace the existing first paragraph with the following new paragraph and note:

The shore connection switchgear and control gear shall be designed and tested in accordance with IEC 62271-200 or ANSI/UL Metal-Clad Switchgear (IEEE Std C37.20.2™). Switching devices and their combination shall be electrically and mechanically interlocked, to provide safe isolation before earthing and during operation.

NOTE 1 Switching devices and their combination for isolation and earthing can be part of different switchgear functional units (see IEC 60050-441:2000, 441-13-04).

Replace, in the existing note, the word "NOTE" with "NOTE 2".

#### 7.3.4 Fibre-optic connection

Delete the existing subclause, including its title.

## B.1 General

Delete, in the existing first paragraph, the words "excluding pure car carriers".

*Add, after the existing last paragraph, the following new note:*

NOTE IEC/IEEE 80005-1:2019/AMD1 removes the wording “excluding pure car-carriers”. This is not to make Annex B applicable for vehicles carriers/pure care carriers. A new annex for vehicles carriers is under consideration for a potential future edition.

### **Figure B.1 – General system diagram**

*Replace the existing key 2 and 3 with the following new keys:*

- 2 Power ship connector (shore-side) and ship inlet (onboard)
- 3 Fibre optic communication for control and monitoring (integrated in power cable); socket-outlet (shore-side) and plug (on-board) (this document does not specify requirements for optic communication)

### **B.7.1 General**

*Replace the existing paragraph with the following new paragraph:*

For 6,6 kV systems, one cable shall be used for HVSC system up to a power demand of 3,5 MVA. For 11 kV systems, one cable shall be used for HVSC system up to a power demand of 6,5 MVA.

### **B.7.3.1 General**

*Replace the existing first paragraph with the following new paragraph:*

General arrangement of ship connector and ship inlet shall be in accordance with IEC 62613-2:2016, Annex J, and Figure B.3 below.

### **Figure B.3 – Three-phase plug and socket-outlet contact assignment**

*Replace the existing title with the following new title:*

### **Figure B.3 – Three-phase ship connector and ship inlet contact assignment**

*Replace the existing key 1 and key 2 with the following new keys:*

- 1 Ship connector face
- 2 Ship inlet face

*Add, after the existing key, the following new note:*

NOTE Pins are showed as solid circles and sockets as open circles.

*Replace the last existing two paragraphs with the following new paragraphs:*

Each connector and ship inlet shall be fitted with seven pilot contacts.

For design and dimensions, see IEC 62613-1 and IEC 62613-2:2016.

### **B.7.3.4 Fibre-optic connection**

*Delete the existing subclause, including its title.*

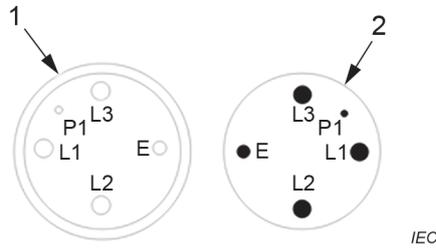
### **Figure C.1 – General system diagram**

*Replace the existing key 2 with the following new key:*

- 2 Ship connector (shore side) and ship inlet (onboard), four times

**Figure C.4 – Three-phase ship connector and ship inlet contact assignment**

Replace the existing figure and key with the following new figure, key and note:



**Key**

- 1 Ship connector face
- 2 Ship inlet face
- E Earth
- P1 Pilot line 1 (used for continuity check)
- L1 Phase A – phase R
- L2 Phase B – phase S
- L3 Phase C – phase T

NOTE Pins are showed as solid circles and sockets as open circles.

**Figure D.1 – General system diagram**

Replace the existing key 3 with the following new key:

- 3 Fibre optic communication for control and monitoring (integrated in power cable); plug (shore-side) and socket outlet (on-board) (this document does not specify requirements for optic communication)

**D.7.3.1 General**

Replace, in the existing third paragraph, the word "Annex II" with "Annex I".

**Figure D.3 – Three-phase plug and socket-outlet contact assignment**

Add, after the existing key, the following new note:

NOTE Pins are showed as solid circles and sockets as open circles.

**D.7.3.4 Fibre-optic connection**

Delete the existing subclause, including its title.

**Figure E.1 – General system diagram**

Replace the existing key 2 and 3 with the following new keys:

- 2 Power ship connector (shore-side) and ship inlet (onboard)
- 3 Fibre optic communication for control and monitoring (integrated in power cable); socket-outlet (shore-side) and plug (on-board) (this document does not specify requirements for optic communication)

**E.7.3.1 General**

Replace, in the existing first paragraph, the words "shore plug and ship socket-outlet" with "ship connector and ship inlet".

## **Figure E.2 – Three-phase ship connector and ship inlet contact assignment**

*Replace the existing key 1 and key 2 with the following new keys:*

- 1 Ship connector face
- 2 Ship inlet face

*Add, after the existing key, the following new note:*

NOTE Pins are showed as solid circles and sockets as open circles.

### **E.7.3.4 Fibre-optic connection**

*Delete the existing subclause, including its title.*

## **Figure F.1 – General system diagram**

*Replace the existing key 2 and key 4 with the following new keys:*

- 2 Power ship connector (shore-side) and ship inlet (onboard)
- 4 Pilot wires (integrated in ship connector and ship inlet)

### **F.7.3.1 General**

*Replace the existing second and third paragraphs with the following new paragraphs:*

General arrangement of ship connector and ship inlet shall be in accordance with IEC 62613-2:2016, Annex I, and Figure F.2 below.

Each ship connector and ship inlet should be fitted with three pilot contacts.

## **Figure F.2 – Three-phase shore plug and ship socket-outlet contact assignment**

*Replace the existing title with the following new title:*

## **Figure F.2 – Three-phase ship connector and ship inlet contact assignment**

*Replace the existing key 1 and key 2 with the following new keys:*

- 1 Ship connector face
- 2 Ship inlet face

*Add, after the existing key, the following new note:*

NOTE Pins are showed as solid circles and sockets as open circles.

## **Bibliography**

*Add, after the existing first reference, the following new references:*

IEC 60050-441, *International Electrotechnical Vocabulary – Part 441: Switchgear, controlgear and fuses* (available at [www.electropedia.org](http://www.electropedia.org))

IEC 60092-101, *Electrical installations in ships – Part 101: Definitions and general requirements*

*Delete the existing reference IEEE Std C37.20.2™.*