BS EN 15869-3:2010

BSI Standards Publication

Inland navigation vessels — Electrical shore connection, three phase current 400 V, up to 63 A, 50 Hz

Part 3: On-board unit, safety requirements

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National foreword

This British Standard is the UK implementation of EN 15869-3:2010.

The UK participation in its preparation was entrusted to Technical Committee SME/32/-/11, Ships and marine technology - Intermodal, inland navigation and short sea shipping.

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

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

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Bateaux de navigation intérieure - Connexion au réseau électrique terrestre, courant triphasé 400 V, à 63 A, 50 Hz - Partie 3: Unité à bord, exigences de sécurité

Fahrzeuge der Binnenschifffahrt - Elektrischer Landanschluss, Drehstrom 400 V, bis 63 A, 50 Hz - Teil 3: Bordseitiger Teil, sicherheitstechnische Anforderungen

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 15869-3:2010) has been prepared by Technical Committee CEN/TC 15 “Inland navigation vessels”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2010, and conflicting national standards shall be withdrawn at the latest by August 2010.

EN 15869, *Inland navigation vessels — Electrical shore connection — Three-phase current 400 V, up to 63 A, 50 Hz* comprises:

— *Part 1: General requirements*

— *Part 2: Onshore unit, safety requirements*

— *Part 3: On-board unit, safety requirements*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

Inland navigation vessels are equipped with a variety of electrical loads operating at 230 V or 400 V. While underway, continuous electrical power supply is provided by the onboard system from generators driven by diesel engines. When the vessel is berthed, these generators have to remain in operation if there is no suitable onshore power supply available. In some cases, this leads to intense noise pollution both for the crew on the vessel itself and on other vessels lying alongside and also for residents ashore. The exhaust fumes are an additional pollution factor.

The electrical shore connections specified in this standard make it possible to provide the vessels with an electrical power supply while berthed and to eliminate noise and exhaust pollution. This calls for a uniform Europe-wide connection that can be activated and deactivated by the vessel's crew in all ports and berths, if possible, without requiring any assistance from shore-based personnel. This standard contains electrical safety requirements for the prevention of hazards in making, using and breaking the shore connection.

Furthermore, cashless settlement for the electricity used shall be possible, ideally a standard Europe-wide payment system.

Electrical shore connections with a permissible current of over 63 A as used for passenger ships with a hotelling function are not covered by this standard.

1 Scope

This European Standard specifies requirements applicable to equipment for shore-to-vessel supply of three-phase 400 V electrical power up to 63 A and a frequency of 50 Hz to berthed inland navigation vessels.

This part of the European Standard specifies safety requirements for the connection cable and the on-board unit of the electrical shore connection.

2 Normative references

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

EN 15869-1, *Inland navigation vessels — Electrical shore connection, three phase current 400 V, up to 63 A, 50 Hz — Part 1: General requirements*

EN 15869-2, *Inland navigation vessels — Electrical shore connection, three phase current 400 V, up to 63 A, 50 Hz — Part 2: Onshore unit, safety requirements*

EN 60076-1, *Power transformers — Part 1: General (IEC 60076-1:1993, modified)*

EN 60309-1, *Plugs, socket-outlets and couplers for industrial purposes — Part 1: General requirements (IEC 60309-1:1999)*

EN 60309-2, *Plugs, socket-outlets and couplers for industrial purposes — Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories (IEC 60309-2:1999)*

EN 60309-4, *Plugs, socket-outlets and couplers for industrial purposes — Part 4: Switched socket-outlets and connectors with or without interlock (IEC 60309-4:2006, modified)*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

HD 22.16 S2, *Cables of rated voltages up to and including 450/750 V and having cross-linked insulation — Part 16: Water resistant polychloroprene or equivalent synthetic elastomer sheathed cables*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
electrical shore connection
equipment consisting of electrical power-supply station, cable set and feed unit for the supply of electrical power to inland navigation vessels in ports and at berths

[EN 15869-1:2010]

3.2
electrical power-supply station
shore-side part of the electrical shore connection with one or more connector units

[EN 15869-1:2010]

3.3
connector unit
<inland navigation> unit for connecting an inland navigation vessel

[EN 15869-1:2010]

3.4
activation medium
<inland navigation> system for activating the supply of power and cashless settlement of the costs

[EN 15869-1:2010]

3.5
feed unit
<inland navigation> all the onboard devices for receiving the electrical power on board

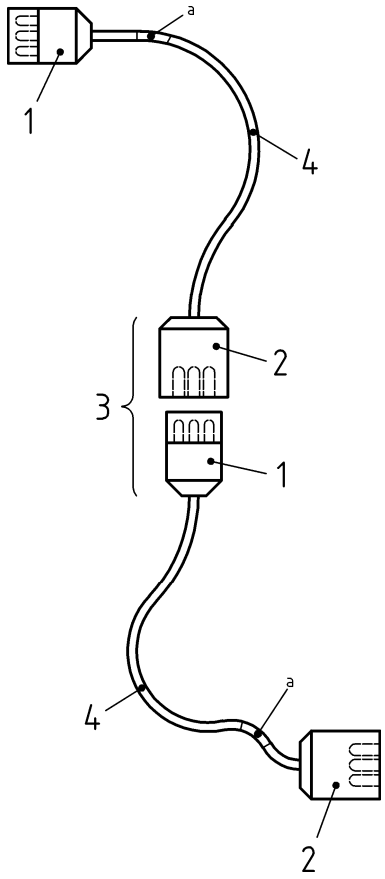
[EN 15869-1:2010]

3.6
connection cable
insulated, protected (e.g. fire protection) electrical component

3.7
cable set
connection cable fitted with plug and coupler (flexible cable) or plug and permanently installed on one end on the vessel

4 Safety requirements

4.1 Cable set



Key

1 plug
2 coupler
3 cable coupler
4 connection cable
1 + 4 + 2 flexible cable set

[a] field for marking

Figure 1 — Example of a cable set with extension

An H07RNF cable according to HD 22.16 S2 shall be used as the cable set as shown in Figure 1. The cross-section shall be as indicated in Table 1.

Table 1 — Maximum length of cable set and extension

Cross-section mm^2	**Max. length for 16 A** m	**Max. length for 32 A** m	**Max. length for 63 A** m
5 × 2,5	70	not permissible	not permissible
5 × 4	130	not permissible	not permissible
5 × 6	220	110	not permissible
5 × 10	—	180	not permissible
5 × 16	—	280	140

It is recommended selecting the cable length such that the mass of one single cable set does not exceed 20 kg. For heavy cable sets, mobile cable drums should be used

NOTE Five-core cables have the following approximate masses: 5 × 2,5 mm² 0,26 kg/m, 5 × 4 mm² 0,48 kg/m, 5 × 6 mm^2 0,62 kg/m, 5 × 10 mm^2 1,07 kg/m, 5 × 16 mm^2 1,53 kg/m.

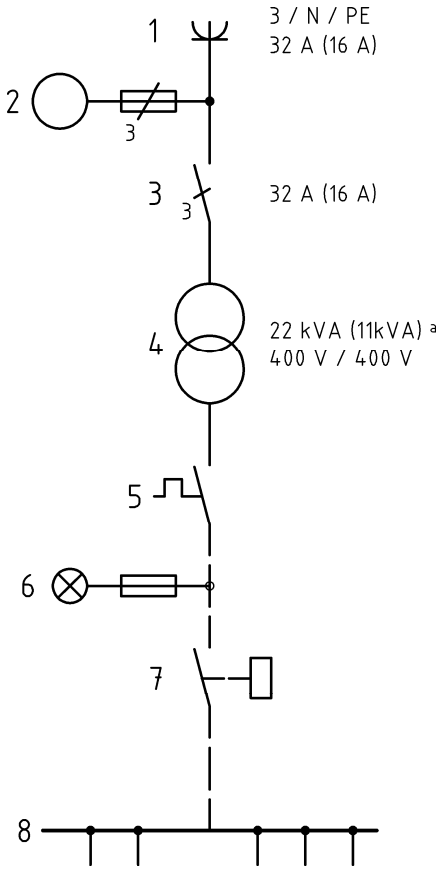
The cable set may be permanently attached to the feed unit (type A) or be connected by means of a plug-and-socket connection (type B). The plug-and-socket connections shall meet the requirements of EN 60309-1, EN 60309-2 and EN 60309-4.

The cable set shall be provided by the vessel.

Cable sets may be extended. The cross-sections of all the connection cables used shall be as shown in Table 1 and be designed according to the overall length of the cable set.

4.2 Feed unit

4.2.1 General



Key

1 equipment plug or permanently attached cable according to EN 15869-1

2 phase-sequence indicator

3 all-pole switch according to EN 15869-1

4 isolating transformer according to EN 15869-1

5 overload protector

6 indicator light

7 interlock against on-board supply system generators

8 main control panel

[a] The values given apply to the 16 A connection.

For the 32 A connection, 32 A and 22 kVA apply
For the 63 A connection, 63 A and 44 kVA apply

Figure 2 — Block diagram of a feed unit

The feed unit (see Figure 2) shall be prefabricated for permanent installation on board.

The feed unit shall be supplied with instructions containing details on how the unit is to be safely installed (e.g. permanent installation, freedom of movement when using it, height of the plug-and-socket device, prevention of the risk of falling, keeping walkways clear, reducing the effects of the weather, etc.).

4.2.2 Mechanical safety

The housing of the feed unit shall be sufficiently mechanically resistant, durable, flame-resistant and non-hygroscopic. It shall not be possible to open it with without tools.

The feed unit shall be constructed for ambient temperatures of –20 °C to +60 °C.

4.2.3 Electrical safety

If the feed unit is not integrated in the onboard electrical switchgear cabinet, it shall have a connection block to connect a cable leading to this control panel. The feed unit shall not have any socket outlets fitted.
.
The feed unit shall only be connectable to the onboard electrical power supply by a power transformer in accordance with EN 60076-1.

Feed units constructed for deck installation shall have at least IP 55 degree of protection in accordance with EN 60529.

Each onboard electrical power supply shall have one feed unit only. If there is more than one plug-and-socket connection, they shall be interlockable against each other.

The plug-and-socket connection shall meet the requirements of EN 60309-1, EN 60309-2 and IEC 60309-4.

A phase-sequence indicator shall be installed.
.
The feed from the electrical shore connection shall be all-pole switchable on the vessel-side and protected against overload. The switches and overload protector may be located in the main control panel of the vessel.

An interlock shall be provided to prevent parallel operation of the onboard generators with the shore-side electricity supply.

It shall be visible on the feed unit whether the connection is live or not.

5 Designation

5.1 Cable set

Designation of a cable set of an electrical shore connection according to Part 3 (3) of this standard, with a plug-and-socket connector on both ends (type B) (B) and 50 m in length (50) for a current of 32 A (32):

Cable set EN 15869-3 — B — 50 — 32

5.2 Feed unit

Designation of a feed unit of an electrical shore connection according to Part 3 (3) of this standard, with a permanently attached cable (type A) (A) and 20 m in length (20):

Feed unit EN 15869-3 — A — 20

Designation of a feed unit of an electrical shore connection according to Part 3 (3) of this standard, without a permanently attached cable (type B) (B):

Feed unit EN 15869-3 — B

6 Marking

6.1 Cable set

The connection cable of the electrical shore connection shall have permanent markings on the shore-side plug-and-socket connection that include at least the following details:

— "cable set according to EN 15869-3";

— manufacturer or manufacturer's mark;

— cross-section;

— length in metres.

6.2 Feed unit

The feed unit of the electrical shore connection shall have permanent markings that include the following details:

— EN 15869-3;

— manufacturer or manufacturer's mark;

— notice with at least the following details:

"Supply of only one electrical power-supply station according to EN 15869-2 by means of a cable set according to EN 15869-3.

Supply to on-board systems of other vessels only if they have a feed unit according to EN 15869-3 and only by means of a cable set according to EN 15869-3.

If the cable set is extended: note the cross-sections of the connection cable!".

— table of maximum length data for cable sets and extensions.

7 Manufacturer’s declaration of conformity

The manufacturer declares the conformity of the electrical shore connection with this standard.

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