
No.67 Test and Installation of busbar trunking systems

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(Rev.1
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1. Scope

This Unified Recommendation is for the test and installation of busbar trunking systems arranged outside of switchboards for supplying section and/or distribution boards or consumers, instead of cables.

They are not recommended to be installed:

- in hazardous areas
- on the exposed weather deck

2. System design

The function of the system is to transfer electrical power; system may consist of:

- electric conductors (busbars), including neutral and earthing conductors and the insulation/isolators
- arrangements for busbars housing
- connectors and tap-off units
- bulkhead and deck penetrations
- protection devices of the busbar trunking system
- bulkhead/deckhead fixing arrangements
- separation units

3. Requirements

3.1 Basic Requirements

The safety standard and availability of ship mains designed to include such systems should be at least equivalent to those of conventionally cabled ship mains.

3.2 Component Requirements

3.2.1 General

Systems should comply with the relevant requirements of IEC 61439-1 and IEC 61439-6.

3.2.2 Ambient Temperatures

Temperatures should be considered in the range from 0 to 45⁰ C.

Note: Reference is made to UR M40

3.2.3 Protection Against Foreign Bodies and Water

Systems should be designed to comply with the following minimum degrees of protection:

- dry spaces, IP 54
- wet spaces, IP 56

No.67 3.2.4 Mechanical Design

(cont)

The system should be designed to withstand a vibration level of 1 mm amplitude in the frequency range of 2 Hz to 13.2 Hz and of 0.7g acceleration in the frequency range of 13.2 Hz to 100 Hz.

It should be suitable for automatic draining where condensation is possible.

The enclosure of the system should be designed to be sufficiently robust, or alternatively additionally protected, to withstand normal mechanical forces which may be expected on board ships.

3.2.5 Fire Protection, Bulkhead and Deck Penetrations

The complete system should comply with the fire test requirements as specified in IEC 60332-1-1 & IEC 60332-1-2.

Bulkhead and deck penetrations of systems should conform to categories laid down by SOLAS and are not to impair the mechanical, watertight and/or fire integrity of the bulkheads or decks through which they pass.

The internal arrangements of the ducts should have the same fire integrity arrangements as the divisions which they pierce.

3.3 System Requirements

3.3.1 Installation Configuration

Redundant essential consumers should be supplied by separate systems. The installation should be such that a failure in one system does not impair the operation of the redundant one.

Where a system is arranged below the uppermost continuous deck, the vessel's manoeuvrability as well as the safety of the crew and passengers should not be impaired in the event of one more watertight compartments outside the engine room being flooded.

Main and emergency supply should not be installed in a common duct.

System should be fitted with means for separation to enable maintenance works and the segregation of damaged parts.

Where systems are led through fire sections, the separation units should be installed on the supply side.

3.3.2 Protection Devices

The propagation of electric arcs along the busbars should be prevented by arc barriers or other suitable means, such as, in the case of systems with uninsulated busbars, the use of current limiting circuit breakers.

No.67 4. Tests

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4.1 Type Testing

At least the following tests should be carried out on a typical and representative sample:

Table 1

No.	Test	Test Procedure according to	Notes
1	Temperature rise test	IEC 61439-6	
2	Short-circuit strength test	IEC 61439-6	
3	Verification of resistance and reactance	IEC 61439-6 8.2.8	
4	Verification of structural strength	IEC 61439-6 8.2.9	See 3.2.4 above
5	Insulation resistance test for main and auxiliary circuits	UR E10 test item No. 9	
6	High-voltage test for main and auxiliary circuits	UR E10 test item No. 10	
7	Vibration test	UR E10 test item No. 7	
8	Bulkhead and deck penetrations tests	IMO Res. A.754 (18)	Reference is also made to IMO Resolution MSC.61 (67) Annex 6
9	Fire test	IEC 60332-1-1 & IEC 60322-1-2	
10	Verification of protection degree	IEC 60529	
11	EMC tests	UR E10 test item Nos. 13 to 20	Only if electronic devices form part of the system

4.2 On board survey.

The installation of the system should be to the satisfaction of the surveyor and according to documentation and installation requirements.

The survey cycle and procedure should be according to those required for switch boards (Rec. No.57).

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