

Guideline No.: S-02(202111)



S-02

**NAVIGATION LIGHT
CONTROLLERS**

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Foreword

CCS Product Inspection and Testing Guideline (hereinafter referred to as this Guideline) contains the technical requirements, inspection and testing criteria related to classification and statutory survey of marine products to be applied for CCS approval/inspection.

This Guideline frees the users to adopt other test methods and requirements which are equivalent to or are stricter than this Guideline.

This Guideline is published and updated by CCS, and is released at <http://www.ccs.org.cn>. Your comments or suggestions are welcomed and may be sent to our email addressed mp@ccs.org.cn.

Historical version and release date: S-02(201510) October 20, 2015

Main change:

- 1. Make corrections to the clerical errors in the guide, and the names and definitions are consistent with the CCS Rules and Conventions;**
- 2. Update the version of the referenced standard and regulation;**
- 3. Supplement the type test items.**

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NAVIGATION LIGHT CONTROLLERS

1 Application

This guideline is applicable to the approval and inspection of navigation light controllers installed and used on ships engaged in international voyage. Reference may be made to this chapter for navigation light controllers installed and used on ships navigating in inland waterways and the signal light controllers installed on ships engaged in international voyage and navigating in inland waterways.

2 Basis for approval and inspection

2.1 Chapter 2, Part Four of China Classification Society Rules for Classification of Sea-Going Steel Ships and its Amendments.

2.2 IMO Resolution MSC.253(83) Adoption of the Performance Standards for Navigation Lights, Navigation Light Controllers and Associated Equipment

2.3 Chapter 13, Part Four of China MSA Regulation for Statutory Survey of Ships and Offshore Installations- Technical Regulation for Statutory Surveys of Sea-Going Ships Engaged on International Voyage and its Amendments.

2.4 IEC 60945:2002/COR1:2008 Maritime Navigation and Radio communication Equipment and Systems – General Requirements – Methods of Testing and Required Test Results.

2.5 IMO Resolution A.694(17) General Requirements for Ship borne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids.

3 Definitions

3.1 Navigation light controller is a device capable of operating and controlling the navigation light.

3.2 The terms and definitions used in this chapter are consistent with those in MSC.253(83).

4 Drawings and documentation to be submitted

4.1 The following drawings and documentation to be submitted are to be submitted to CCS for approval

4.1.1 General drawing;

4.1.2 Shell drawing (including panel drawing, bottom plate drawing, etc.);

4.1.3 Panel arrangement plan;

4.1.4 Signs and marks diagram;

4.1.5 Electrical circuit diagram

4.1.6 List of elements and components (including the name, type, specification, quantity, manufacturer or brand of the elements and components as well as their codes in electrical circuit);

4.1.7 Product technical specifications or enterprise standard.

4.2 The following drawings and documentation to be submitted are to be submitted to CCS for review:

4.2.1 Instructions for use (both in Chinese and English);

4.2.2 Process flow chart showing quality monitoring points;

4.2.3 Type, specification and list of qualified suppliers of main raw materials and parts (e.g. integrated circuit chip, printed circuit board, semi-conductor element, fuse, switch, power module, light emitting diode, printed product, insulation paint, etc.);

4.2.4 External wiring diagram;

4.2.5 Software description (including programming platform, software type, software version, etc., applicable to products with programmable elements);

4.2.6 Software flow chart/program block diagram (applicable to products with programmable elements).

5 Design and technical requirements

5.1 Navigation light controllers are to be powered directly from the main switchboard and emergency switchboard; if an emergency source of power is provided, navigation light controllers are to be powered from the emergency switchboard and temporary emergency charging and discharging panel. Navigation light controllers are to have the function of main power failure alarm and power source change over.

5.2 Navigation light controllers are to have light testing function.

5.3 The failure of indicator light of navigation light controllers is not to cause extinction of the navigation light.

5.4 Navigation light controllers are to be such as to facilitate the on/off control of each navigation light

5.5 Navigation light controllers are to provide visual indication of the on/off condition of the navigation light.

5.6 Navigation light controllers are to provide setting of pre-grouped navigation light. 5.7 Navigation light controllers on ships not less than 50m in length are to provide alarms of the following failures:

5.7.1 Navigation light power failure; and

5.7.2 Failure, including short circuit, of a lamp which is switched ON.

5.7.3 Navigation light controllers on board a ship not less than 50 m in length should present the status of all NLs in a logical presentation, meeting the requirements set out in resolution MSC.191(79), e.g., by symbol marks on a display.

5.7.4 All indicators of Navigation light controllers should be dimmable to ensure easy reading without disturbing the night vision of the Officer of the Watch. The brightness of a display, if fitted, of Navigation light and signal light controllers should be controllable.

5.7.5 Navigation light controllers are to support use of standard serial interface of the maritime navigation and communication system.

5.7.6 The Navigation light controllers should have a bi-directional interface to transfer alarms to external systems and receive acknowledgements of alarms from external systems. The interface should comply with the relevant

international standards IEC61162.

6 Type test

A complete set of navigation light controller is to be sampled by the surveyor for type test and the type test is to be carried out at least in accordance with the test items listed in the table below:

TYPE TEST ITEM TABLE

Table 6

No.	Test category	Test item	Technical requirements	Test method
1	Visual inspection	Appearance, marking, process inspection	CCS rules/enterprise standards/drawings	Visual inspection
2	Function test	Main power failure alarm and power changeover function tests	2.7.4.3, Section 7, Chapter 2, PART FOUR of the Rules for Classification of Sea-going Steel Ships; 5.4.1 and 6 of Resolution MSC. 253(83)	2.7.4.3, Section 7, Chapter 2, PART FOUR of the Rules for Classification of Sea-going Steel Ships; 5.4.1 and 6 of Resolution MSC. 253(83)
3		Failure of indicator light of controllers is not to cause extinction of the navigation light.	2.7.4.4, Section 7, Chapter 2, PART FOUR of the Rules for Classification of Sea-going Steel Ships	2.7.4.4, Section 7, Chapter 2, PART FOUR of the Rules for Classification of Sea-going Steel Ships
4		Navigation light on/off and condition indication function test	5.1、5.2、5.5 of Resolution MSC. 253 (83)	5.1 、 5.2 、 5.5 of Resolution MSC. 253 (83)
5		Navigation light broken circuit fault alarm function test	5.4.2 of Resolution MSC. 253 (83)	5.4.2 of Resolution MSC. 253 (83)
6		Controller dimming function test	5.6 of Resolution MSC. 253 (83)	5.6 of Resolution MSC. 253 (83)
7		Alarm signal external transmission and answer signal receiving function test	5.7 of Resolution MSC. 253 (83)	IEC61162
8		Two-way serial communication	5.8 of Resolution MSC. 253 (83)	IEC61162

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		interface test		
9	Power supply	Extreme power supply variation	7.1、 5.2.2 of IEC60945	7.1 、 5.2.2 of IEC60945
10		Excessive conditions	7.2、 5.2.3 of IEC60945	7.2 、 5.2.3 of IEC60945
11		Power supply short-term variation①	7.3、 10.7 of IEC60945	7.3、 10.7 of IEC60945
12		Power supply failure①	7.4、 10.8 of IEC60945	7.4、 10.8 of IEC60945
13	Environmental conditions	Dry heat	8.2 of IEC60945	8.2 of IEC60945
14		Damp heat	8.3 of IEC60945	8.3 of IEC60945
15		Low temperature	8.4 of IEC60945	8.4 of IEC60945
16		Vibration	8.7 of IEC60945	8.7 of IEC60945
17		Salt mist (corrosion)②	8.12 of IEC60945	8.12 of IEC60945
18	Electromagnetic compatibility	Conducted emissions	9.2 of IEC60945	9.2 of IEC60945
19		Radiated emissions from enclosure port	9.3 of IEC60945	9.3 of IEC60945
20		immunity to conducted disturbances induced by radio-frequency fields	10.3 of IEC60945	10.3 of IEC60945
21		Immunity to radiated, radio-frequency, electromagnetic field	10.4 of IEC60945	10.4 of IEC60945
22		Electrical fast transients/burst immunity t	10.5 of IEC60945	10.5 of IEC60945
23		Surge immunity	10.6 of IEC60945	10.6 of IEC60945
24		Electrostatic discharge immunity	10.9 of IEC60945	10.9 of IEC60945
25		Special purpose	Acoustic noise and signals	11.1 of IEC60945
26	Compass safe distance		11.2 of IEC60945	11.2 of IEC60945
27	Safety precautions	Protection against accidental access to dangerous voltage	12.1 of IEC60945	12.1 of IEC60945
28		Electromagnetic radio frequency radiation	12.2 of IEC60945	12.2 of IEC60945
29		Emission from	12.3 of IEC60945	12.3 of IEC60945

	visual display unit(VDU)③		
30	X-radiation③	12.4 of IEC60945	12.4 of IEC60945

① Power supply short-term variation test is not applicable to D.C. powered equipment. Power supply failure test is not applicable to equipment intended for operation from battery power sources or fitted with back-up batteries.

② Salt mist (corrosion) test may be waived where the manufacturer is able to produce evidence that the components, materials and finishes employed in the equipment would satisfy the test.

③ The test may be waived where the manufacturer is able to produce evidence that the equipment would satisfy the test.

7 Unit/batch inspection

7.1 In the Unit/batch inspection after type approval, the surveyor should carry out the product inspection according to the approved product inspection plan.

7.2 Unit/batch inspection items are to include at least the following:

- (1) Visual inspection
- (2) Function test
- (3) Insulation resistance test
- (4) High voltage test