



中国船级社
CHINA CLASSIFICATION SOCIETY

证书格式号/Form: T02.02-
CQ000059

型式认可证书
CERTIFICATE OF TYPE APPROVAL

证书编号/Certificate No. HB17T00052_01

兹证明本证书所述制造厂生产的下列产品能够满足下面列明认可标准的要求。

This is to certify that the following products produced by the manufacturer stated in the certificate can meet the requirements of the approval standards listed below.

认可产品/ Product Approved

电控陀螺罗经和转向率信号输出系统

Electric gyro-Compass and Rate of Turn Signal Output

电控陀螺罗经

Electric gyro-Compass

品牌拥有方/ Licensor

Northrop Grumman Sperry Marine B.V.

Woltmanstrasse 19, D-20097 Hamburg, Germany

附加标志/ Notations

无/Nil.

认可标准/ Approval Standard

- 1.国际海事组织大会决议A.821(19)《高速船陀螺罗经性能标准》
IMO Resolution A.821(19) Performance Standards for GYRO-COMASSES for high-speed craft
- 2.国际海事组织大会决议A.694(17)《作为全球海上遇险和安全系统（遇险和安全系统）组成部分的船载无线电设备和电子助航设备的一般要求》
IMO Resolution A.694(17) General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids
- 3.IEC 60945:2002/COR1:2008《船用航行和无线电通信设备及系统-通用要求-试验方法和试验结果的要求》
IEC 60945:2002/COR1:2008 Maritime Navigation and Radiocommunication Equipment and Systems –General Requirements – Methods of Testing and Required Test Results
- 4.ISO 20672: 2007《船舶和海上技术 - 航向变化率指示器》
ISO 20672:2007 Ships and marine technology - Rate of turn indicators
- 5.ISO 8728: 2014《船舶和海上技术 - 航海用陀螺仪器》
ISO 8728:2014 Ships and marine technology - Marine gyro-compasses

证书有效期至/ This Certificate is valid until

2022年1月16日 / Jan. 16, 2022

发证机构
Issued by

中国船级社汉堡分社
CCS Hamburg Branch

签发日期
Date

2018年1月14日
Jan. 14, 2018

本证书根据中国船级社《钢质海船入级规范》及有关程序规定签发。关于证书的有关规定见本证书背面的说明。当本证书包括多页纸张时，则所有证书页为一个整体，必须同时使用。每一页证书均须由本社盖章方为有效。证书复印件无效。任何单位和个人均不应摘录或节选本证书的部分内容。本认可证书不代表本社对个体产品质量的检验。有关各方对所持证书的真实性有疑问时，可以向本社检验机构咨询。
This Certificate is issued pursuant to the Rules for Classification of Sea-going Steel Ships and related procedures of the Society. Refer to the back of the certificate for detailed requirements of the certificate. When the certificate consists of more than one page, all pages of the certificate are taken as a whole and are used simultaneously. No certificate page is valid without bearing the stamp of the Society and no copied form of the certificate is regarded as valid. Any part of the certificate is not to be extracted or abridged by any unit or individual in any form. This approval certificate does not constitute the inspection of the Society about the quality of the unit/batch product. Related parties who are doubted about the authenticity of the certificate may inquire of the Society or its offices.



中国船级社总部/CCS headquarters: 北京市东直门南大街9号船检大厦 邮编: 100007 电话/Tel: +86(10)58112288 传真/Fax: +86(10)58112811
CCS Mansion, 9 Dongzhimen Nan Da Jie, Beijing 100007, China 网址/Web Site: <http://www.ccs.org.cn>
本地检验机构/CCS Local Office: 中国船级社汉堡分社 CCS Hamburg Branch 电话/Tel: 0049-40-3860890 传真/Fax: 0049-40-38608918

HB87514131

N^o. 16807692

- 6.国际海事组织大会决议A.424(XI)《陀螺罗经性能标准》
IMO Resolution A.424(XI) Performance Standards for Gyro-Compasses
- 7.国际海事组织大会决议A.526(13)《回转速率指示仪性能标准》
IMO Resolution A.526(13) Performance Standards for Rate-of-Turn Indicators
- 8.国际海事组织海安会决议MSC.191(79)《通过船上航行显示有关航行信息的性能标准》
IMO Resolution MSC.191 (79) Performance Standards for the Presentation of Navigation-Related Information on Shipborne Navigational Displays
- 9.ISO 16328: 2014《船舶和海上技术 - 高速船陀螺罗经》
ISO 16328:2014 Ships and marine technology -- Gyro-compasses for high-speed craft

授权制造企业/ The Manufacturer(s) Authorized By The Licensor

1.LITEF GmbH;Loerracher strasse 18,D-79115 Freiburg Germany

产品明细/ Product Description

电控陀螺罗经/Electric gyro-Compass

产品型号/Model

主要组成部件/Main Components

: CompassNet (Type 5026)
: Data Distribution Unit(DDU),
Converter and Amplifier
Unit(CAU),
NAVITWIN V Control and Display
Unit(CDU),
NAVIGAT 100(Gyro-Compass),
NAVIGAT 200(Gyro-Compass),
NAVIGAT 3000(Fiber-Optic Sensor
Unit),
NAVIGAT 2200(Fiber-Optic Sensor
Unit)

首向精度/Heading accuracy

外壳防护等级/Degree of Protective enclosures

: 见附页/See additional page(s)
: IP 23 (DDU);
IP 23 (CAU);
IP 23 (frame mount)/IP45 (front
side, console) (CDU);
IP 23 (NAVIGAT 100);
IP 23 (NAVIGAT 200);
IP 23 (NAVIGAT 3000);
IP 23 (NAVIGAT 2200).

供电电源/Power supply

: main: 24VDC;backup:24VDC

批准的图纸和设计计算书/ Approved Drawings and Design Calculations

图纸批准号/ Drawings Approval No.

: NP16A03215;NP17A00356

产品认可试验报告/ Approval Test Report

试验报告编号/Test Report No.

: 5017-0141-03 rev B

试验报告日期/Test Report Date

: 2016-04-25

试验单位/ Laboratory

: Sperry Marine

试验单位地址/ Test Address

: Hamburg, Germany

试验报告编号/Test Report No.

: 5026-0141-07 Rev B

试验报告日期/Test Report Date

: 2016-04-25

试验单位/ Laboratory

: Sperry Marine

试验单位地址/ Test Address

: Hamburg, Germany

试验报告编号/Test Report No.

: 5026-0141-02 Rev B

试验报告日期/Test Report Date

: 2016-04-20

试验单位/ Laboratory

: Sperry Marine

试验单位地址/ Test Address

: Hamburg, Germany

试验报告编号/Test Report No.

: 5026-0141-01 Rev A

试验报告日期/Test Report Date

: 2016-03-21

试验单位/ Laboratory

: Sperry Marine

试验单位地址/ Test Address

: Hamburg, Germany



试验报告编号/Test Report No.	:	5017-0141-01_A1
试验报告日期/Test Report Date	:	2016-03-21
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	5019-0141-01 Rev B
试验报告日期/Test Report Date	:	2016-04-07
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	5026-0141-04 Rev A
试验报告日期/Test Report Date	:	2016-03-21
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	5026-0141-05 Rev A
试验报告日期/Test Report Date	:	2016-03-16
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	5026-0141-03 Rev A
试验报告日期/Test Report Date	:	2016-04-12
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	002-16
试验报告日期/Test Report Date	:	2016-04-12
试验单位/ Laboratory	:	Treo labor fuer umweltsimulation GmbH
-		
试验单位地址/ Test Address	:	Tempowerkring 19, D-21079 Hamburg, Germany
-		
试验报告编号/Test Report No.	:	003-16
试验报告日期/Test Report Date	:	2016-02-09
试验单位/ Laboratory	:	Treo labor fuer umweltsimulation GmbH
-		
试验单位地址/ Test Address	:	Tempowerkring 19, D-21079 Hamburg, Germany
-		
试验报告编号/Test Report No.	:	16-042
试验报告日期/Test Report Date	:	2016-03-29
试验单位/ Laboratory	:	Bureau Veritas Consumer Products Services Germany GmbH
-		
试验单位地址/ Test Address	:	Thurn-und-Taxis-Strasse 18, D-90411 Nuernberg, Germany
-		
试验报告编号/Test Report No.	:	16-045
试验报告日期/Test Report Date	:	2016-03-29
试验单位/ Laboratory	:	Bureau Veritas Consumer Products Services Germany GmbH
-		
试验单位地址/ Test Address	:	Thurn-und-Taxis-Strasse 18, D-90411 Nuernberg, Germany
-		
试验报告编号/Test Report No.	:	5023-0141-02
试验报告日期/Test Report Date	:	2016-12-16
试验单位/ Laboratory	:	Sperry Marine
-		
试验单位地址/ Test Address	:	Hamburg, Germany
-		
试验报告编号/Test Report No.	:	EMCC-930106.1RE
试验报告日期/Test Report Date	:	2016-10-20
试验单位/ Laboratory	:	EMCCons DR. RASEK GmbH Co. KG
-		
试验单位地址/ Test Address	:	Boelwiese 8, 91320 Ebermannstadt, Germany



试验报告编号/Test Report No.	:	146181-5000-546 A
试验报告日期/Test Report Date	:	2016-11-11
试验单位/ Laboratory	:	Northrop Grumman LITEF GmbH
试验单位地址/ Test Address	:	Loerracher Strasse 18, 79115 Freiburg, Germany
试验报告编号/Test Report No.	:	146181-0000-546 B
试验报告日期/Test Report Date	:	2016-06-28
试验单位/ Laboratory	:	Northrop Grumman LITEF GmbH
试验单位地址/ Test Address	:	Loerracher Strasse 18, 79115 Freiburg, Germany
试验报告编号/Test Report No.	:	5026-0141-08
试验报告日期/Test Report Date	:	2017-04-26
试验单位/ Laboratory	:	Sperry Marine
试验单位地址/ Test Address	:	Hamburg, Germany

产品适用范围/ Application of the Product

海船及高速船/Sea-going ship and High speed crafts

认可保持条件/ Maintenance Requirements of Approval

1. 型式认可后, 如果产品及其重要零部件的设计、所用材料或制造方法有所改变, 且影响到产品的主要特性、特征; 或产品的性能指标有所更改, 且超过认可的范围, 则有关图纸和文件应经检验机构审批。并在检验机构认为必要时, 经本社检验人员见证有关试验和进行检查, 其结果应能证实仍符合认可条件。
After type approval, if there are changes to the design, materials used or manufacturing method of the product and important components and such changes affect major characteristics and properties of the product, or property indexes of the product are changed and exceed the scope of approval, related drawings and documents are to be examined and approved by the concerned survey office. Where deemed necessary by the survey office, the surveyor to the Society will go to witness relevant tests and conduct inspection and the results should be able to demonstrate compliance with the approval conditions.
2. 工厂的质量管理体系应保持有效运行, 并且与认可时一致。如果质量管理体系发生改变, 应经原体系认证机构审核并报本社批准。
The quality management system of the factory shall be ensure effective operation, and shall be the same as the situation of approval. If there are any changes to the quality management system, auditing of the original certification organization for quality management system and the society's approval shall be obtained.
3. 认可证书有效期内, 如果出现可能导致本社取消认可的情况, 工厂应及时采取有效的纠正措施。
Within the validity of the approval certificate, if cases occur that may cause the Society to withdraw the approval, the manufacturer should take corrective actions in a prompt and effective manner.
4. 在认可证书有效期内, 本社检验人员可在未经事先通知的情况下对工厂的产品制造过程进行审核, 以验证产品的生产是否符合业经本社批准的图纸和文件。工厂应予以配合。
Within the validity of the approval certificate, the surveyor to the Society may pay unannounced audit to the manufacturing process of the product in order to confirm whether it is in compliance with the drawings and documents approved by the Society. The factory should provide an active cooperation and necessary for the surveyor.
5. 如果属于获得型式认可B 模式证书, 且无需颁发船用产品证书/等效证明文件的情况, 证书获得者应接受本社每年一次的定期审核, 定期审核日为认可证书期满之日对应的每一周年日, 检查工作可在周年日的前后三个月内进行。
If belong to the situation of the product has type approval mode B certificate, and marine product certificate/equivalent document is not necessary, those who have obtained the certificate should be subject to periodical audit every year. The periodical audit should be carried out within 3 months before and after the anniversary date which corresponds to the date of expiry of the relevant.
6. 本认可证书的有效期与品牌拥有方和产品制造企业之间的授权协议保持一致, 但不得超过4年。
The period of validity of this certificate is consistent with that of the agreement between the licensor and the manufacturer(s), but in no case it can over 4 years.
7. 在本证书有效期间, 品牌拥有方和产品制造企业之间的授权协议的失效将自动导致本证书的失效。
During the period of validity, this certificate will automatically be ineffective in case of the invalidity of the authorization agreement between the licensor and the manufacturer(s).

认可后的产品检验方式/ Method of Product Inspection after Approval

按照规范逐件检验的产品/The product inspected one by one in term of the rules;
认可后的产品检验应由本社验船师根据本社规范规定逐件按批准的产品检验计划进行检验, 经检验合格后由本社颁发船用产品证书。

After approval, product inspection should be carried out one by one by the Surveyor of the Society in accordance with the approved product inspection scheme, and the Marine Product Certificate will be issued by the Society upon satisfactory inspection.

对于原材料和零部件的检验要求/ Inspection Requirements for Materials and Components

产品如下原材料和零部件应由本社认可的制造厂生产/The following materials and components of the product should be manufactured by the factory approved by the Society:无/Nil.

产品如下原材料和零部件应经本社检验/The following materials and components of the product should be inspected by the Society:无/Nil.

产品如下原材料和零部件的制造厂清单, 经本社批准方可变更/The list of manufacturer for the following materials and components of the product should not be changed without the Society's approval:无/Nil.

责任声明/Statement of Responsibility

本社的认可不影响、替代与本社授权或检验无关的各方对上述工厂的认可和发证, 并且不对与本社授权或检验无关的各方负责, 不承担其未经应允而承认、接受本社认可所导致的法律和经济责任。

The approval of the Society does not affect and replace any approval and certification of the manufacturer by any parties that bear no relation with this Society's authorization or survey and therefore takes no responsibility for these parties. The Society does not undertake any legal and economic liabilities arising from accepting this Society's certificate without prior permission from this Society.

本证书中的品牌拥有方应对其品牌使用的合法性负责。

The licensor of this certificate should be responsible for the legality of using of relevant brand(s) and design(s).

其他/Others

1. 本证书由原型式认可证书 (No. HB17T00028) 变更并换新。

This certificate is modified and renewed from the previous Type Approval Certificate No. HB17T00028.

2. EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. 45313-16HH & 45315-16HH

3. CompassNet-System and Heading Management System NAVITWIN V description:

The CompassNet-System offers the possibility to connect other type approved Gyro-Compasses via CAU (Converter and Amplifier Unit) Type:5018 and CAB (Converter and Amplifier Board) Type:5018-5100.

The Heading Management System NAVITWIN V is a central control and display device for multi-compass systems for the maritime navigation of vessels. (Data Distribution Unit type:5017; NAVITWIN V type:5019).

4. Application and limitation:

CompassNet and navigation data provided by the NAVIGAT 200 and/or the NAVIGAT 3000 and/or the NAVIGAT 2200 are not allowed to be used for the navigation of inland water vessels and river boats.

Installation to be performed according to the manufactures Operation, Installation and Service manual.

5. 本社已审核了产品厂无石棉声明, 但本社的审核不免除产品厂按照合同关系向订货方保证产品无石棉的责任。

The declaration of asbestos-free submitted by manufacturer has been reviewed by the Society.

However, liability of the manufacturer to guarantee the products are asbestos-free to purchaser under contract will not be exempted.

中国船级社汉堡分社

CCS Hamburg Branch 01

*****本证书正文完/ End of Text*****

注: 本证书含有附页, 共3页

Note: The certificate is attached with 3 additional page(s)

Products description

NAVIGAT 200

Operational Characteristics	
Mean settling time	< 3h
Max. follow-up speed	100° /s
Freedom of roll and pitch with container Mod.10	±40°
Accuracies	
Heading resolution	0.1°
Sampling rate	≥50Hz
Liner mean settle point error	≤0.1° x secant latitude
Static heading error	≤0.1° x secant latitude
Dynamic heading error (range of operation within 70° S to 70° N latitude)	≤0.4° x secant latitude
Deviation after 3min. power interruption	≤2°
Rate of Turn resolution	≤0.5° /minute, ±5%
Rate of Turn damping	0 to 10 sec.

NAVIGAT 200

Accuracies(under all operating conditions)	
Heading	≤0.4° secant latitude(RMS)
Roll and pitch angles	≤0.1° for angles ≤45° (95%)
Rate of turn	≤0.018° /minute
X and Y rates	≤0.4° /minute
Operational Characteristics	
Settling time/static alignment	≤210 seconds(Latitude≤45°)
Settling time/static alignment	≤10 minutes(Latitude≤78°)
Settling time/static at sea	≤30 minutes(Latitude≤78°)
Max. follow-up speed	100° /s

NAVIGAT 2200

Operational Characteristics	
Operational range	±78° latitude ±108° longitude
Velocity	±70 kn
Accuracies	
Heading	≤0.7° x secant latitude(RMS)
Roll and pitch angles	≤0.5° for angles ≤±60° (RMS)
Rate of turn	1000 ppm (0.1%)RMS
X and Y rates	1000 ppm (0.1%)RMS
Alignment	
Self Alignment time w/dynamic ship conditions at sea	Approx.30 min.(depending on ship dynamics)(Latitude≤78°)
Self Alignment time w/static ship conditions	20 minutes(Latitude≤78°)
Stored Alignment time w/static ship conditions	6 minutes(Latitude≤78°)
Manual Alignment time w/dynamic ship conditions at sea	1~20 min.(depending on accuracy of heading start value)(Latitude≤78°)
Communication Interfaces	
User Input/Output	RS422, Binary Digital Interface

—To be continued—



Products description

1. Components necessary for operation:

Designation	Main component	Type designation
NAVIGAT 200	Master compass	5026
	Gyrosphere	4911 or 5000
	Container Mod.10/3	4991-4000
	Or Container Mod.10/4	5026-4000
NAVIGAT 100	Master compass	5026 -AA
	Gyrosphere	4911 or 5000
	Container Mod.10/3	4991-4000
	Or Container Mod.10/4	5026-4000
NAVIGAT 3000	Master compass	5021
NAVIGAT 2200	Master compass	5023

The following units may be used:

Designation	Type designation
Converter and Amplifier Unit	5018
Converter and Amplifier Board	5018-5100
Data Distribution Unit	5017
DDU Processor Module	5017-2000
NAVITWIN V	5019
Steering repeater (console mounted)	5016AA
Steering repeater (console mounted)	4881
Steering repeater (console mounted)	4881AA
Steering repeater (console mounted)	5016AB
Steering repeater (console mounted)	4881AD
Repeater (bulkhead mounted)	5016AC
Repeater (bulkhead mounted)	4881AC
Repeater (bulkhead mounted)	4881AK
Bearing repeater	5016
Bearing repeater	4881AB
Bearing repeater	4881AM
Bearing repeater stand	4622AB or 4622AC or 4622AD
Bearing repeater stand (Sperry)	1812783
Bearing repeater bracket	4890
Bearing repeater bracket (height adjustable)	4905
Terminal box	4884
Terminal box	4894
Rate-of-Turn Indicator (in housing with bracket)192mm	60402 Range +- 30°/min
Rate-of-Turn Indicator (console mounted) 192mm	60372 Range +- 30°/min
Rate-of-Turn Indicator (console mounted) 192mm	60421 Range +- 60°/min
Rate-of-Turn Indicator (console mounted) 192mm	60379 Range +- 90°/min
Rate-of-Turn Indicator (console mounted) 192mm	60380 Range +-300°/min
Rate-of-Turn Indicator (console mounted) 144mm	60368 Range +- 30°/min
Rate-of-Turn Indicator (console mounted) 144mm	60393 Range +- 60°/min
Rate-of-Turn Indicator (console mounted) 144mm	60369 Range +- 90°/min
Rate-of-Turn Indicator (console mounted) 144mm	60370 Range +-300°/min

—To be continued—

Products description

The options unit:

Designation	Type designation
Gyro Compass NAVITGAT X MK1	4914
Gyro Compass NAVITGAT X MK2	4991
Gyro Compass NAVITGAT 2100	4913
Gyro Compass NAVITGAT 2200	5023
Gyro Compass NAVITGAT 3000	5021
Compass Monitor NAVITWIN III	4923
Heading Management System NAVITWIN IV	4994
Voyage Data Printer(only in connection with NAVITWIN)	4805
Gyro Compass Control Unit	4926
Fluxgate Coil for Magnetic Compass	4863
Digital Tape Repeater	DTR600
Universal Digital Repeater (UDR)	4891
Multifunction Display NAVIDATA	4806 AC
Multifunction Display NAVIDATA	4806 AD
Multifunction Display NAVIDATA	4806 AE
Switch over box	4932
Splitter box	4936 or 4992
Optoisolator	55555
Powder Supply	2568
Rate-of-Turn Indicator (console mounted) 96mm	60364 Range +- 30°/min
Rate-of-Turn Indicator (console mounted) 96mm	60366 Range +- 90°/min
Rate-of-Turn Indicator (console mounted) 96mm	60367 Range +- 300°/min

Software versions:

NAVIGAT 200	1.xx
NAVIGAT 100	1.xx
NAVIGAT 3000	10.xx
NAVIGAT 2200	20.x
Converter and Amplifier Unit	1.xx
Converter and Amplifier Board	1.xx
Data Distribution Unit	1.xx
DDU Processor Module	1.xx
NAVITWIN V	1.xx

Magnetic Clearance	NAVIGAT 2200	NAVIGAT 3000	NAVIGAT 100	NAVIGAT 200	CAU	CDU	DDU
To standard magnetic compass	0.55m	0.75m	0.50m	0.50m	0.55m	0.45m	0.30m
To steering magnetic compass	0.40m	0.50m	0.35m	0.35m	0.35m	0.35m	0.30m

