

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Remote Control System Steering Gear

with type designation(s)
Steering Gear Control System STCS5000

Issued to
Navis Engineering Oy
VANTAA, Finland

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules to be provided upon installation on board

Issued at **Høvik** on **2019-03-29**

for **DNV GL**

This Certificate is valid until **2021-03-28**.

DNV GL local station: **Helsinki**

Approval Engineer: **Sergey Gilmiyarov**

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Jan Tore Grimsrud
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

The Steering and Thruster Control System includes the following elements:

Description	Unit Type Designation	SW version
Alarm and Control Station	ACS-F	0800XXYY 1400XXYY 0707XXYY
Alarm and Control Panel	ACP-5	0800XXYY
Steering Control Station	SCN-NFU, SCN-TWIN	0707XXYY
Non-Follow-Up & Full-Follow-Up Panel	LVR-NF, LVR-NF-m	3101XXYY
Electric Wheel	M05A	N/A
Rudder Feedback Unit	NavRFU-D	4000XXYY
Rudder Feedback Unit	NavRFU	N/A
RFU Interface Box	IB-RFU	2506XXYY
ADIV Interface Box	IB-ADIV	0506XXYY
VDR Interface Box	IB-VDR	1506XXYY
Rudder Angle and Order Indicator	IND-5-R	0900XXYY
Power Unit	MD-P	N/A
Hydraulic Lock Unit	HLU	N/A
NFU Selection Box	NSB	N/A
Feedback Distribution Unit	FDU	N/A
Power Distribution Unit	PWR-DU	N/A
Steering Mode Selector	SMS	N/A

XXYY shall be represented by fixed digits for implementation of minor changes not affecting DNV GL Rules' requirements.

Software update notification

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Places of manufacture

1. Navis Engineering Oy, Tuupakantie 3 A, VANTAA, Finland
2. Navis AO, Detskaya Street, 5A, St. Petersburg, Russian Federation

Approval conditions

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- Test program for product certification

The Type Approval covers hardware and software listed under Product description. No further application software is necessary for delivery of an application system.

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The configuration file, i.e. the output of the Configuration Tool AS as readable listing, is to be checked against this Certificate with respect to hardware and software versions. After the certification the clause for software control will be put into force.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board.

Type Approval documentation

Steering and Thruster Control System Operation and installation manual	STCS5000-UGE
Block diagram	FI00054-11203-BDE
Power arrangement diagram	FI00054-11203-PWE
NAVIS STCS5000 Steering Control System FMEA	FMEA-STCS5000
LVR-NF operator manual	ST-29503-UGE
SCN operator manual	ST-22201-UGN and ST-22202-UGN
ACP-5 operator manual	ST-26404-UGE
ACS operator manual	ST-22101-UGN
IND-5 operator manual	ST-29306-001-UGE
Environmental test program	STCS5000-ETP_rev01
ACS-F internal wiring diagram	ST-22106-INE
ACP-5 external wiring diagram	ST-26404-EXE
SCN-TWIN internal wiring diagram	ST-22212-INE
SCN internal wiring diagram	ST-22213-INE
LVR-NF internal wiring diagram	ST-29503-INE
LVR-NF external wiring diagram	ST-295**-EXE (** - 03, 04, 06, 08, 11)
LVR-NF-m external wiring diagram	ST-295**-EXE (** - 05, 07, 09, 10, 12)
M05A external wiring diagram	ST-29601-EXE
NavRFU internal wiring diagram	ST-29307-INE
NavRFU external wiring diagram	ST-29307-EXE
NavRFU-D external wiring diagram	ST-29310-EXE
IB-RFU internal wiring diagram	AP-37204-INE (R7)
IB-RFU external wiring diagram	AP-37204-EXE
IB-ADIV, IB-VDR Interface box	AP-37203-EXE
IND-5-R Internal wiring diagram	ST-29306-INE
IND-5-R external wiring diagram	ST-293**-EXE (** - 06, 08, 09, 11, 12)
MDP internal wiring diagram	ST-27104-INE
HLU internal wiring diagram	ST-27302-INE
NSB internal wiring diagram	ST-28401-INE
FDU internal wiring diagram	ST-28501-INE
PWR-DU internal wiring diagram	ST-28301-INE
SMS internal wiring diagram	ST-25*00-INE (* - 2, 3, 4)
STCS4000 Test report IP44 IP56	266602-3
STCS4000_Climatic Test Report	266602-1
STCS4000_EMCC Test Report	266553-1
STCS4000_Vibration Test report	266602-2
EMC Test Report	288184-1
RESEARCH REPORT	VTT-S-02004-17
RESEARCH REPORT	VTT-S-06683-17
RESEARCH REPORT	VTT-S-07107-17
Type Approval Assessment Report dated 2019-01-04 issued at Helsinki	
Type Approval Assessment Report dated 2018-12-24 issued at St. Petersburg	

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, Edition November 2016.
Functional test (Factory Acceptance test report No 14122018) performed at 2018-12-14 at St. Petersburg.

Marking of product

Name of the manufacturer
Model:
Cat. N:
Ser. N:
Supply Voltage:
Power Consumption:

Job Id: **262.1-029890-1**
Certificate No: **TAA000027U**

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed at least at renewal of this certificate.

END OF CERTIFICATE