

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Steering Gear Control System

with type designation(s)
NT850

Issued to

Navitron Systems Ltd.
Havant, Hampshire, United Kingdom

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 **Hamburg** on **2018-07-27**

This Certificate is valid until **2020-07-26**.

DNV GL local station: **Southampton**

for **DNV GL**

Approval Engineer: **Jörg Rebel**

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Arne Schaarmann
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 Navitron NT850 Main Steering Control System comprises appropriate combinations – dependent upon configuration – of the following equipment:

NT850 STA Steering Amplifier
NT850 STA/2 Steering Amplifier
NT850 WFU Wheel Follow Up Steering Control
NT850 FU Lever Follow Up Steering Control
NT850 BWS Bridge Wing Selector Switch
NT850 NFUS Non Follow Up Selector Switch
NT850 FUMS Follow Up Sync/Independent Mode Selector Switch
NT850 NFU Non Follow Up Steering Control (with Sync Key)
NT851 NFU Non Follow Up Steering Control (without Sync Key)
NT850 OVSW Override Switch
NT850 STMS Steering Mode Selector Switch
NT850 STMS/2 Steering Mode Selector
NT851 STMS Combined Steering System & Steering Mode Selector Switch
NT851 STMS/2 Combined Steering Mode and System Selector Switch
NT852 STMS Steering Mode Selector Switch
NT850 STSS Steering System Selector (with Pump Selection)
NT851 STSS Steering System Selector (without Pump Selection)
NT855 STSS Steering System Selector Switch
NT855 STSS/2 Steering System Selector Switch
NT855 STSS/3 Steering System Selector Switch
NT850 CMDS Station in Command Selector
NT850 CMDS/2 Command Source Selector
NT850 CMDA Station in Command Indicator & Alarm Unit
NT850 ROT Rudder Order Telegraph master unit
NT850 ROT2 Rudder Order Telegraph slave unit (up to 3)
NT850 ROT DB Rudder Order Telegraph Distribution Box
NT850 RSA Rudder Sync Alarm
NT850 RSA DB Rudder Sync Alarm Distribution Box
NT850 PSTMS Power Steering Mode Selector Switch
NT850 SCS Station Command Selector
NT850 MSDB Multi Station Distribution Box
NT850 RSMI Remote Steering Mode Indicator
NT850 ESS Emergency Steering Selector Switch
NT850 MSA Main Steering Alarm Indicator
NT851 MSA Main Steering Alarm Indicator
NT850 MSA DB Main Steering Alarm Distribution Box
NT850 SMUX Serial Multiplexer Unit
NT850 SFA Steering Fail Alarm
NT850 SFA1 Steering Fail Alarm
NT850 SFA2 Steering Fail Alarm
NT850 SFA DB Steering Fail Alarm Distribution Box
NT850 DSRL Dual Speed Rudder Limit
NT850 DHR Digital Heading Repeater & ROT Indicator
NT850 DIM/2 Dimmer Control
NT850 MACB Main/Aft Control Junction Box
NT850 JB1/DC Single Junction Box
NT850 JB2/DC Dual Junction Box
NT850 SJB1/DC Single Auto Pump C/O Junction Box
NT850 SJB2/DC Dual Auto Pump C/O Junction Box
NT850 JB1/AC Single Junction Box
NT850 JB2/AC Dual Junction Box
NT850 SJB1/AC Single Auto Pump C/O Junction Box
NT850 SJB2/AC Dual Auto Pump C/O Junction Box
NT850 PSU 150VA Power Supply Unit

Job Id: **262.1-028730-1**
Certificate No: **TAA00001V8**

NT851 PSU 40VA Power Supply Unit
NT1000 RRU Rudder Reference Unit
NT920 DRRU Dual Rudder Reference Unit
NT850 JB1/PV Single Proportional Valve Driver
NT850 JB2/PV Dual Proportional Valve Driver

The following Rudder Angle Indicators may be used:

NT850 RAI Rudder Angle Indicator
NT1000 RAI Rudder Angle Indicator

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 certification

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

The software numbers and versions are listed in document NT850SWR/1 containing the respective latest versions. The document status from 2018-07-26 is the basis for this Type Approval Certificate.

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated document NT850SWR/1. 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.

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. 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

DNV GL No	Document ID	Rev.	Description
1	-	2018-06-26	Report: NT850 main steering system - Functional Test Plan
2	8260	2017-07-24	Report: Tests acc. to IEC 60945, Sects. 8.2 to 8.4 and 8.7
3	17J278 CR	2017-07-26	Report: EMC tests acc. to IEC 60945, Sects. 9, 10 and 11.2
4	17J278 CC	2017-07-26	Certificate: EMC compliance
5	-	2018-04-17	Statement: Compliance with IACS UR E25
6	0514/4	-	Manual: Installation & Technical
7	0416/5	-	Manual: Installation & Technical - Addendum no. 1
8	-	2018-07	Manual: Installation & Technical - Addendum - Part 3

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, Edition November 2016 and IEC 60945 (2002) including Corrigendum 1 (2008).

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

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