DNV·GL

Certificate No:
TAA00001SG
File No:
861.20
Job Id:
262.1-018075-2

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Remote Control System, Controllable Pitch Propeller

with type designation(s)
Alphatronic 3000 Propulsion Control System

Issued to
MAN Energy Solutions
Frederikshavn, Nordjylland, Denmark

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

Application :

System certificate only

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

This Certificate is valid until **2019-06-30**.

Issued at **Høvik** on **2018-08-29**
DNV GL local station: **Aalborg** for **DNV GL**

Approval Engineer: **Marthe Kristine Tautra Hoen**

Odd Magne Nesvåg
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.
If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million.
In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

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Product description

The Alphatronic 3000 propulsion control system is used for remote control of a ship's propulsion line. A two-stroke low speed engine directly connected to the propeller shaft line or a four–stroke medium speed engine is connected to a fixed pitch propeller (FPP) or controllable pitch propeller (CPP) through a reduction gearbox, with optional clutch control for the main engine clutch, power take–off (PTO) clutch to a shaft generator (SG) and the power take–in (PTI) clutch for a pony motor to start up the SG in PTI mode (optional) used for electrical take-home power. The Alphatronic 3000 is operated by means of setpoint levers and colour graphic touch panels.

The Alphatronic 3000 is operated as an independent stand–alone system, with all information and internal alarms displayed on the graphic operator panels.
When the Alphatronic 3000 is delivered together with a MAN four–stroke engine, the PCS is interfaced with the units fitted on the engine. These units ensure local control, engine monitoring and engine safety functions.
Local control and monitoring of the propeller and possibly the gear box, is carried out from the system called Local Propulsion Control System (LPCS). For certain MAN engines, the LPCS will share the Local Operator Panel (LOP) with the engine. From the LOP, also the order telegraph can be operated.

The Alphatronic 3000 can, depending in the actual plant, provide control of:
- Main engine start/stop
- Main engine setpoint (combinator, constant rpm and separate)
- Main engine load control (load control limitations)
- Main engine load reduction (rpm and/ or load reduction)
- Combinator control from single lever in ECR and on the bridge
- Controllable pitch propeller (CPP) setpoint system (combinator curves)
- Control transfer (bridge/ECR setpoint selection)
- Propulsion mode selection (combinator, constant rpm and separate)
- Bridge wing control with wing panels and electric shaft on setpoint levers
- Alarm announcement and indication

The Alphatronic 3000 can be extended with the following options:
- Clutch control (ME, PTO and PTI (engage/ disengage)
- Propeller shaft speed measurement and indication
- Interface to PTO connected shaft generator (SG waiting station)
- Alternative propulsion (PTI mode)
- El motor operating with stopped (ME)
- Power boost (ME + PTI simultaneously)
- Speed Pilot integrated in the system
- Manoeuvring order printer integrated in the system

The remote control system constitutes the following parts:

a) Alphatronic 3000 PCU. Main cabinet with process computer and I/O modules
b) Propulsion control panels for remote control of the propulsion machinery via graphic colour touch screens
c) Setpoint levers with electric shaft ensuring bumpless transfer, also to/from ECR
d) Communication telegraph system
e) Emergency stop panels
f) External interfaces to connected systems

A combination of b), c), d) and e) will form a control station for centre bridge, bridge wings, aft bridge or ECR.

The parts are separately Type Approved as listed below:

Designation	MAN type no.	Supplier	Suppliers type	DNV GL or GL type approval
DPU2010	2162185-3	Lyngsø Marine	810.001.660	TAA000019G
DPU2020	2193574-2	Lyngsø Marine	810.001.820	TAA000019G
SIO2010	2170155-9	Lyngsø Marine	810.003.200	TAA000019G
PFM2200	2140453-0	Lyngsø Marine	810.001.410	TAA000019G
BI.40-SUP-E	2170300-9	Lyngsø Marine	810.005.050	TAA000019G
PCS.C2	2170304-6	Lyngsø Marine	810.005.070	TAA000019G
PF.C1	2170093-5	Lyngsø Marine	810.005.090	TAA000019G
Ethernet Switch 5/8 ports	2168790-0 2175330-0	MOXA	EDS-405A EDS-408A	TAA000006N TAA000006K
Manoeuvring Handle Panel (MHP), single with clutch	2169974-0	Lyngsø Marine	810.005.310	TAA000019G
MHP, single without clutch	2170286-5	Lyngsø Marine	810.007.610	TAA000019G
MHP, double with clutch	2169966-8	Lyngsø Marine	810.005.320	TAA000019G
MHP, double without clutch	2170288-9	Lyngsø Marine	810.007.620	TAA000019G
Telegraph Panel	2169984-7	Lyngsø Marine	810.005.400	TAA000019G
Propulsion Control Panel (Display Panel)	2169982-3	Lyngsø Marine	810.005.300	TAA000019G
Emergency Stop Panel	2170270-8	Lyngsø Marine	810.005.410	TAA000019G
Dial instruments		DEIF	XL	59588-08 HH
Propulsion Indication Panel	2169977-6	DEIF	XDi 192	61011-13 HH

The Alphatronic 3000 remote control system and the LPCS local control system will interface with the SaCoS_one engine control and safety systems delivered by the engine manucaturer and DNV GL Type Approved through Certificate TAA0000002 or a successor to this.

Application/Limitation

For high speed category B passenger vessels where two propulsion lines with both normal and backup control from the operating compartment is required at least two control stations shall be arranged.

Reset of required protective safety functions shall normally be arranged from the machinery space only. Reset from the bridge is accepted for E0 vessels while operated with unattended machinery spaces but only for overspeed shutdown and safety functions caused by blackout (manual reset after blackout is an alternative to automatic reset, ref. DNVGL-RU-SHIP Pt.6 Ch.2 Sec.2 [3.2.1.3]).

Approval conditions

The Type Approval covers hardware listed under Product description.

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)
- List of implemented functions
- List of control and monitored points
- Layout of bridge control panels
- FAT procedure where items to be checked reflect list of implemented functions
- References to Type Approval Certificates certificates if those listed above have been replaced (or not issued yet)

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The Certification is to be performed at the manufacturer before the system is shipped to the yard. After 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. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.
Functional Type Test conducted at the manufacturer on 2014-11-18 with a system intended for a DNV classed vessel.

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

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE