DNV·GL

Certificate No:
TAA00001T9

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Remote Control System, Propulsion

with type designation(s)
MAREX OS II, Marex OS III, Marex OS3D

Issued to
Aventics GmbH
Laatzen, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :

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

Different location classes from the below table are listed in the certificate.

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

Issued at **Hamburg** on **2018-06-25**
This Certificate is valid until **2020-06-24**.
DNV GL local station: **Essen**

Approval Engineer: **Holger Jansen**

for **DNV GL**

Joannis Papanuskas
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.

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Product description

This type approval certificate covers hardware and software for MAREX OS II, MAREX OS III and Marex OS3D remote propulsion control system,
as well as back up remote control system for gear propulsion (item 10).

1. Control Units
   24Vdc, 3A, (Modular, MAN, Cabinet, Plus)
   a) MAREX OSII - MPC - For Main Engines with Reverse Gear Units:

Product No.	Product description	Location classes	SW
3460690000	MPC / Control Unit Modular		O2WG V5.01.20
3460690010	MPC / Control Unit MAN		O2WG V4.122M
3460690020	MPC / Control Unit Cabinet	B/B/A/B/B	O2WG V5.01.20
3460690030	MPC / Control Unit Plus	B/B/A/B/B	O2WG V5.01.20P
3460690040	MPC / Control Unit MAN S&G		O2WG V4.50M

   b) MAREX OSII - MPC - For Controlable Pitch Propeller:

Product No.	Product description	Location classes	SW
3460690300	MPC / Control Unit Modular		O2VP V6.01.40
3460690320	MPC / Control Unit Cabinet	B/B/A/B/B	O2VP V6.01.40

   c) MAREX OS III - MPC2 – For Main Engine with Reverse Gear Units:

Product No.	Product description	Location classes	SW
3460690100	MPC2-WG / Control Unit Modular		O3WG V7.01.10
3460690110	MPC2-WG / Control Unit MAN		O3WG V7.01.10M
3460690120	MPC2-WG / Control Unit Cabinet	B/B/A/B/B	O3WG V7.01.10
3460690130	MPC2-WG / Control Unit Plus	B/B/A/B/B	O3WG V7.01.10P
3460690140	MPC2-WG / Control Unit Cabinet2	B/B/A/B/B	O3WG V7.01.10

   d) Marex OS 3D - MPC2 – For Main Engine with Reverse Gear Units:

Product No.	Product description	Location classes	SW
3460690400	MPC2-3D / Control Unit Cabinet	B/B/A/B/B	OS3D V1.05.20
3460690410	MPC2-3D / Control Unit Cabinet2	B/B/A/B/B	OS3D V1.05.20

   e) Pitch Controller – 24Vdc, 0,5A

Product No.	Product description	Location classes	SW
R419300553	CANopen module with PLC external pitch controller	B/B/B/B/*	OSPC V1.03.10

2. Operating Units

Product No.	Product description		Location classes	SW
362231xxx0	231(Operating Module)	24Vdc, max 0,8A	D/B/A/B/*	V0.0
36223150x0	231(Indication Module)			
R419300157	231(Multi-Coulper I²C)			
R417000243	242 (Operating Module)	CAN-Bus		O2BE V2.10
R417000304				
R417000506				
R417000507				

3. Control Heads

a) Control Lever Type 230, 24Vdc, max 2,5A (panel mounted)

Product No.	Product description	Location classes	SW
36223000x0	single lever, RG	D/B/A/B/*	OSKG V2.28
32623010x0	double lever, RG		
36223020x0	single lever, CPP		
36223030x0	double lever, CPP		
36223040x0	single lever, Speed only		
36223050x0	double lever, Speed only		
36223005x0	single lever, RG with lever follow-up		
32623015x0	double lever, RG with lever follow-up		
36223025x0	single lever, CPP with lever follow-up		
36223035x0	double lever, CPP with lever follow-up		
36223045x0	single lever, Speed only with lever follow-up		
36223055x0	double lever, Speed only with lever follow-up		
R417002068	single lever, Reversing Gear		OSCU V2.24
R417002069	single lever, Reversing Gear		
R417002070	double lever, Reversing Gear		
R417002071	double lever, Reversing Gear		
R417002072	single lever, CPP		
R417002073	single lever, CPP		
R417002074	double lever, CPP		
R417002075	double lever, CPP		
R417002076	single lever, Speed only		
R417002077	single lever, Speed only		
R417002078	double lever, Speed only		
R417002079	double lever, Speed only		
R417002080	single lever, RG with lever follow-up		
R417002081	single lever, RG with lever follow-up		
R417002082	double lever, RG with lever follow-up		
R417002083	double lever, RG with lever follow-up		
R417002084	single lever, CPP with lever follow-up		
R417002085	single lever, CPP with lever follow-up		
R417002086	double lever, CPP with lever follow-up		
R417002087	double lever, CPP with lever follow-up		
R417002088	single lever, Speed only with lever follow-up		
R417002089	single lever, Speed only with lever follow-up		
R417002090	double lever, Speed only with lever follow-up		
R417002091	double lever, Speed only with lever follow-up		

b) Control Lever CANIO

Product No.	Product description	Location classes	SW
R419300370	analog inputs for 3 axis	D/B/A/B/*	OSCU V2.24
R419300375	analog inputs for 3 axis		
R419300376	analog inputs for 3 axis		
R419300378	analog inputs for 2 axis		

c) Control Lever Type 240, CAN-Bus, (panel mounted)

Product No.	Product description	Location classes	SW
3622400310	short double lever scale, RG	D/B/A/B/*	O2KG V1.14
3622400320	double lever scale, RG		
3622400600	double lever, RG		
3622401600	single lever, RG		
R417000009	double lever OEM, RG		
R417000010	short double lever OEM, RG		
R417000095	double lever scale, for astern stations, RG		
R417000610	short double lever, RG		
R417000670	short double lever OEM, RG		
R417000760	double lever scale, RG		
R417000764	short double lever scale, RG		
R417000766	single lever scale, RG		
R417000966	single lever illuminated, RG		
R417000975	single lever illuminated, RG		
R417000977	short double lever illuminated, RG		
R417001400	double lever, RG		
R417001635	single lever, RG		
R417001073	triple lever, RG		
R417000828	short single lever, RG		
R417000366	single lever, only ahead, CPP		
R417000368	single lever, CPP		
R417000370	double lever, CPP		
R417000372	double lever, CPP		
R417000374	double lever, only ahead, CPP		
R417000376	double lever, red handles, CPP		

d) Control Lever Type 251, CAN-Bus, IP66 (panel mounted)

Product No.	Product description	Location classes	SW
R417000327	double lever	D/B/A/B/*	O2KG V1.14

e) Control Lever Type 244, CAN-Bus, IP66 (panel mounted)

Product No.	Product description	Location classes	SW
R417000750	double lever, RG	D/B/A/B/*	O2K4 V2.06
R417001130	short double lever, RG		
R417001230	double lever, RG		
R417001350	triple lever, RG		
R417003000	double lever, CPP		
R417003012	single lever, CPP		

f) Control Lever Type 241, CAN-Bus IP66 (panel mounted)

Product No.	Product description	Location classes	SW
R417000356	double lever, RG	D/B/A/B/*	O2KG V1.14
R417000357	single lever, RG		
R417000358	double lever, for astern station, RG		
R417000367	single lever, only ahead, CPP		
R417000369	single lever, CPP		
R417000371	single lever, CPP		
R417000373	double lever, CPP		
R417000375	double lever, CPP		
R417000377	double lever, only ahead		

g) Control Unit Type 230, CAN-Bus, IP66 (panel mounted)

Product No.	Product description	Location classes	SW
3622405312	for external single control heads	D/B/A/B/*	OSKG V2.28

h) Control Unit Marex OS II TFT, CAN-Bus, IP66 (panel mounted)

Product No.	Product description	Location classes	SW
R419300356	TFT, 650cd/m²	D/B/B/B/*	O2DS V1.11
R419300720	TFT Basic, 220cd/m²		

i) Control Lever, CAN-Bus, IP66 (panel mounted)

Product No.	Product description	Location classes	SW
R417002407	Joystick 530 Analog	D/B/B/B/*	-
R417003030	Joystick 531 Marex 3D		JS3D V1.00

4. External Power Supply Unit

5. I/O Module

Product No.	Product description	Technical data	
3460691510	EPU	12-24Vdc, max.2,5A, IP20	
Product No.	**Product description**	**Technical data**	**SW**
3460670010	basis system	24Vdc, max.6,6A, IP54	OSIS V2.14
R419300294			
R419300299			
3460677162	I/O-extension boards		-
3460677172			
3460677182			

6. Modules

Product No.	Product description
R419800170	DDC 712-T
R419800171	AIT 704-T
R419800172	AOT 701-T
R419800173	AIT 701-T
R419800174	CTA 703-T
R419800175	TBA 705
R419800470	CAN-Module**
R419800471	
R419800526	
R419800482	Interface Modul**
R419800481	Suppressor Modul**

Product No.	Product description
R419800472	4 DI-Modul**
R419800646	8 DI-Modul**
R419800473	2 AI-Modul**
R419800648	4 AI-Modul**
R419800949	2 AI-Modul**
R419800475	4 DO-Modul**
R419800768	2 DO-R Modul **
R419800479	Termination**
R419800476	2 DO-R Modul**
R419800647	8 DO-Modul**
R419800477	2 AO-Modul**
R419800649	4 AO-Modul**
R419800950	2 AO-Modul***
R419800480	Voltage supply**

7. Mechanical actuator

Product No.	Product description	
323 698 000 0	70mm stroke, plug	External controlled 12Vdc, max. 4A, IP54
323 698 010 0	120 mm stroke	
323 698 020 0	70 mm stroke	
323 698 100 0	70mm stroke, plug	Internal controlled 24Vdc, max. 4A, IP54
323 698 110 0	120 mm stroke, plug	

8. Data cable

Product No.	Product description
894 605 4xx 2	
R419800155	

Product No.	Product description
894 605xxx2	CAN-Bus Type Sub-D
894 605xxx2	I²C-Bus Type Sub-D

R419800177	CAN-Bus Type M12
R419800178	
R419800179	
R419800180	
R419800181	
R419800182	

894 6202xx2	Type M23
R417000523	

9. Accessories

Product No.	Product description
894 105 42x 4	Terminating Resistor M12
894 605 489 2	Adapter M12/Sub-D
346 067 36x2	Terminating Resistor Sub-D

10. Back-up Remote Control System for Gear Type 232

with 4-digt 7-segment display and membrane keyboard

Product No.	Product description		SW
3622320000	Master Panel	CAN-Bus	NOWG V4.56
3622320100	Slave Panel		

Where enclosure class is '*', denoted an required enclosure protection according to the rules to be provided upon the installation onboard.

Location classes are denoted in the following sequence:
Temperature/Humidity/Vibration/EMC/Enclosure class

Components marked with '**' are 3rd party equipment and are type approved separately.

Application/Limitation

The following documentation of the actual application is to be submitted for approval in each case:
- Functional description
- Reference to this type approval certificate
- System block diagram
- Power supply arrangement
- Equipment list
- List of control and monitored points
- Test program for product certification

Product certificate
Each delivery of the application system is to be certified according to DNVGL Pt.4 Ch.9 Sec.1. The certification tset 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 the application software control will be put into force.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.
Major changes in the software are to be approved before being installed in the computer.

Type Approval documentation

Tests carried out

Applicable tests according to Class Cuideline DNVGL-CG-0339, November 2016.

Marking of product

Components are marked with the company name and product number as listed in the tables above.

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 renewal of this certificate.
END OF CERTIFICATE