

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Control and Monitoring System**with type designation(s)
AHD-IMAC

Issued to

Böning Automationstechnologie GmbH & Co.KG
Ganderkesee, Niedersachsen, Germany

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.****Temperature****Humidity****Vibration****EMC****Enclosure****Location classes: see page 2 and 3.**Issued at **Hamburg** on **2020-08-18**This Certificate is valid until **2022-08-18**.DNV GL local station: **Hamburg CMC**for **DNV GL**Approval Engineer: **Jens Dietrich**

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.



Job Id: **262.1-026327-4**
 Certificate No: **TAA00001MM**
 Revision No: **4**

Product description

Components (application system system may comprise a subset of components)

Type	Description	Temperature	Humidity	Vibration	EMC	Enclosure
AHD 570	5,7" LCD Color Display	B	B	B	B	B (front) A (rear)
AHD 651	6.5" Color TFT-Display	B	B	A	B	C (front) B (rear)
AHD 652	6.5" Color TFT-Display	B	B	A	B	C (front) B (rear)
AHD 880 TC AHD 880 E AHD 880 G	8" Operating Panel with touch screen	B	B	A	B	C (front) A (rear)
AHD 1115 F (foil) AHD 1115 G (glas)	Touch screen Displays 15"	B	B	A	B	C (front) A (rear)
AHD 1119 F (foil) AHD 1119 G (glas)	Touch screen Displays 19"	B	B	A	B	C (front) A (rear)
AHD 1215 F (foil) AHD 1215 G (glas)	Touch ScreenPanel PC 15"	B	B	A	B	C (front) A (rear)
AHD 1219 F (foil) AHD 1219 G (glas)	Touch Screen Panel PC 19"	B	B	A	B	C (front) A (rear)
AHD 1110 F (foil) AHD 1110 G (glas)	Touch Screen Display 10"	B	B	A	B	C (front) A (rear)
AHD 1200	Embedded PC	B	B	A	B	A
AHD 1224 G (glas)	Touch Screen Panel PC 24"	B	B	A	B	C (front) A (rear)
AHD 1310 G (glas) AHD 1310 F (foil)	Touch Screen Panel PC 10"	B	B	A	B	C (front) A (rear)
AHD 406-2	Cabin/Duty Alarm Panel	B	B	A	B	A
AHD-DPU 9	Data Processing Station	B	B	A	B	A
AHD 882	Central Unit	B	B	B	B	*
AHD-SAS 15 M12	Data Station for Analog and Binary Sensors	B	B	B	B	A
AHD-UCC	CAN-Repeater	B	B	A	B	B
AHD-UIC	Compact Protocol Converter (RS485/CAN)	B	B	A	B	A
AHD-R101	CPU-controlled Relay Board	B	B	A	B	*

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AHD-PS15,-30,-47 AHD-PS 15B	Data station with binary inputs B-type with duty selection function	B	B	A	B	*
AHD-WAOP K	Personnel Alarm System	B	B	A	B	B (front) A (rear)
AHD-WAOP	BNWAS	B	B	A	B	B (front) A (rear)

* Required protection according to DNV GL Rules shall be provided upon installation on board

Software / Functions:

CAN network communication with redundancy depending on application. Alarm and monitoring function with graphic data presentation, alarm pages with time stamp, alarm history page, alarm grouping. Control and Monitoring, graphic presentation of ship's data, duty alarm system, duty engineer call alarm system, graphic presentation and control of pumps, valves (MIMICS). Tank measurement and indication. Self-diagnostic alarms. Personnel Alarmsystem, BNWAS.

Software Version - MCU	
3.28.113	AHD 1110 (F+G)
	AHD 1115 (F+G)
	AHD 1119 (F+G)
	AHD 1200
	AHD 1215 (F+G)
	AHD 1219 (F+G)
	AHD 1224 (G)
	AHD 1310 (F+G)

Software Version - AHD 11	
2.1.2578	AHD 1200
	AHD 1215 (F+G)
	AHD 1219 (F+G)
	AHD 1224 (G)
	AHD-DPU 9

No software	
No software	AHD-PS15,-30,-47
	AHD-PS15B

Software Version - Basic circuit board	
1.4.2061	AHD 1200
	AHD 1215 (F+G)
	AHD 1219 (F+G)
	AHD 1224 (G)
	AHD 1310 (F+G)
1.2	AHD 406-2
2.19.1465	AHD 570
	AHD 651
	AHD 880
1.5.19	AHD 882
1.52 / 1.53	AHD R101
4.3.27	AHD-DPU 9
4.4.346	AHD-SAS15 M12
3.5.3.63	AHD-UCC
3.6.74	AHD-UIC
3.1.1	AHD-WAOP
	AHD-WAOP K

Application/Limitation

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This type approval covers part of hardware, system design-principles and basic software listed under Product description.

EMC in the range 2 GHz to 6 GHz according to DNVGL-CG-0339, December 2019 has not been documented. EMC up to 6 GHz must additionally be documented for installation on ships contracted for construction on or after 2022-01-01.

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
- Functional description
- Power supply arrangement (may be part of the System block diagram)
- List of control and monitored points
- Description of function covered by software
- Test program for application software at manufacturer
- For integrated systems: Functional failure analysis including procedure for the test/verification.

This type approval covers part of hardware, system design-principles and basic software listed under Product description.

Product certificate

Each delivery of the application system is to be certified according to DNV GL Pt.4 Ch.9 Sec.1. The Certification of Application Functions 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 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.

Tests carried out

Applicable tests according to DNV GL Class Guideline CG-0339, Nov. 2016.
Functional performance tests for integrated Alarm-, Monitoring and Control System,
For AHD-WAOP (BNWAS): IEC 60945 (appl. parts) and functional tests according to IEC 62616 Ed.1,
IMO Resolution MSC.128(75).

Marking of product


Maker, type designation, power supply, serial number.

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



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

END OF CERTIFICATE