

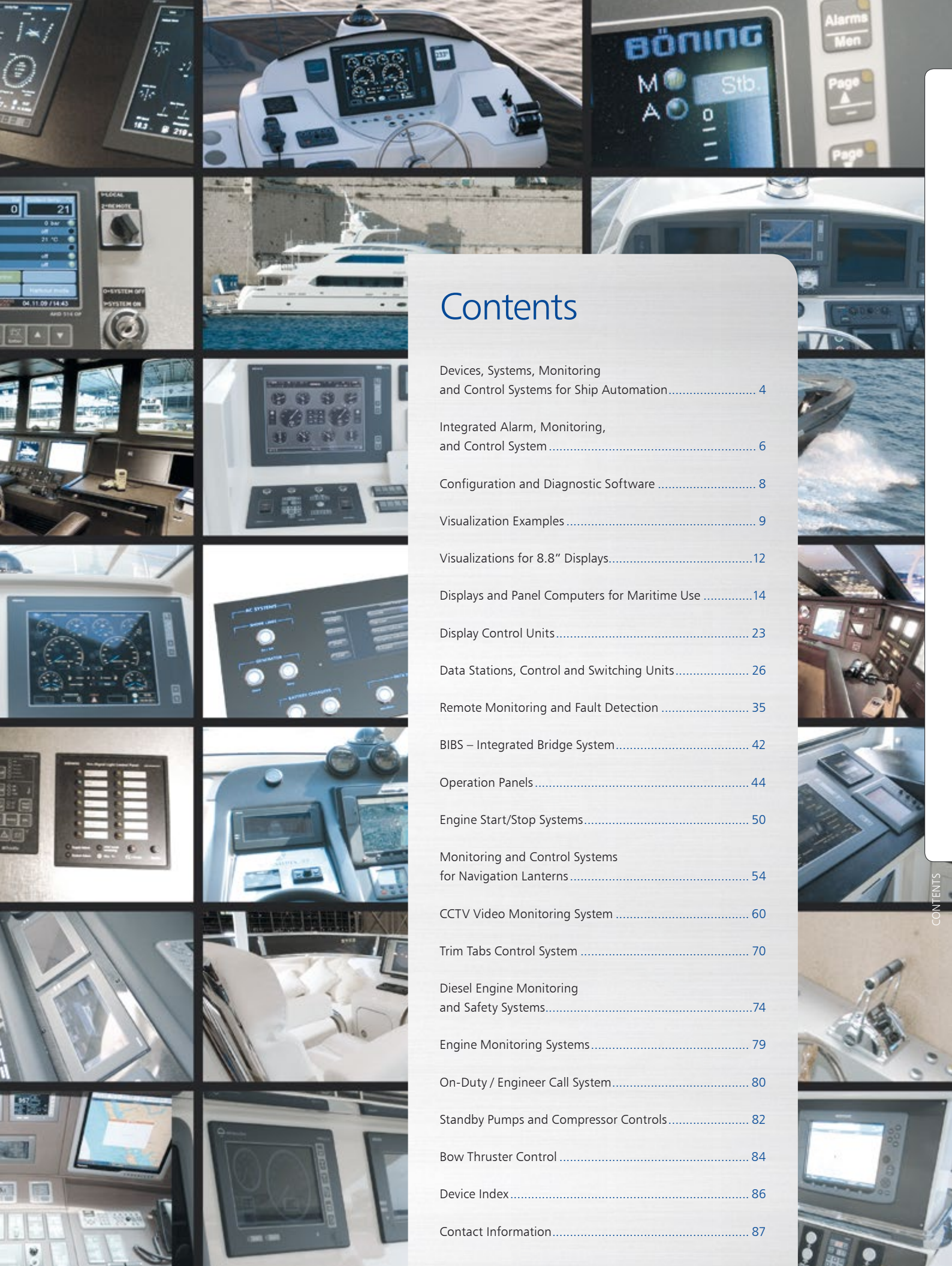
Systems and Devices for Monitoring and Control Technology



Catalog

Ship Automation





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Devices, Systems, Monitoring and Control Systems for Ship Automation

Our company's founding stone was laid in 1977 with the establishment of the Engineering Firm Böning. In 1996, it became the Engineering Firm Böning GmbH, which was renamed to Böning Automationstechnologie GmbH & Co. KG in 2003. From the very beginning, the development and manufacture of electronic devices and systems for ship automation was a major focal point of all company activities.

Originally rooted in commercial shipping, we have also been successfully active in the area of super and mega yachts since 1996. In the meantime, our devices and systems, the majority of which we have developed and manufactured ourselves by the way, are found on more than 13,000 commercial ships and yachts.



By now, a staff of approximately 100, among them about 20 engineers in the area of development alone, are employed here in Ganderkesee in an area of nearly 4000 m² for office, production, and storage space.

One of our responses to the economic crisis beginning in 2008 is our continued drive toward globalization. In this context, we point to branch offices in Brazil, Italy, and Croatia, as well as representatives and distribution partners. This allows us to better meet the demands for competent service and short routes, especially by shipping companies and yacht owners.

One of our recipes for success is based on the close cooperation with our customers, resulting in creation of practice-oriented and reliable devices and systems. From this positive synergy grows a steady expansion of our competence. Here, we point out especially the integrated alarm systems which affect practically all areas of ships.

Safety relevant devices and systems are generally type approved according to Germanischer Lloyd and other classification societies.

Our company is DIN EN ISO 9001:2008 certified.





Integrated Alarm, Monitoring, and Control System

In today's maritime industry, ship crews handle a multitude of diverse systems. Our modern, integrated, and decentralized monitoring system monitors and controls the safe operation of a ship. The systems are visualized on several monitor pages for easy viewing and operation, e. g.

- + Graphic display of generators and propulsion engines
- + Display of power management system data
- + Tanks, fire system, bilge, service, and transfer pumps
- + Doors and hatches, bilge alarms
- + Navigation lanterns, lighting systems, and search lights
- + Display of CCTV camera video images
- + Conning page
- + Other pages with important on-board information



GENERATORS



BLOWERS



TANK LEVELS



WINCHES

AIR
CONDITIONING

SEARCHLIGHT



HORN



NAVLIGHTS



ENGINES



PUMPS



TRIM TABS



THRUSTERS



DOOR ACCESS



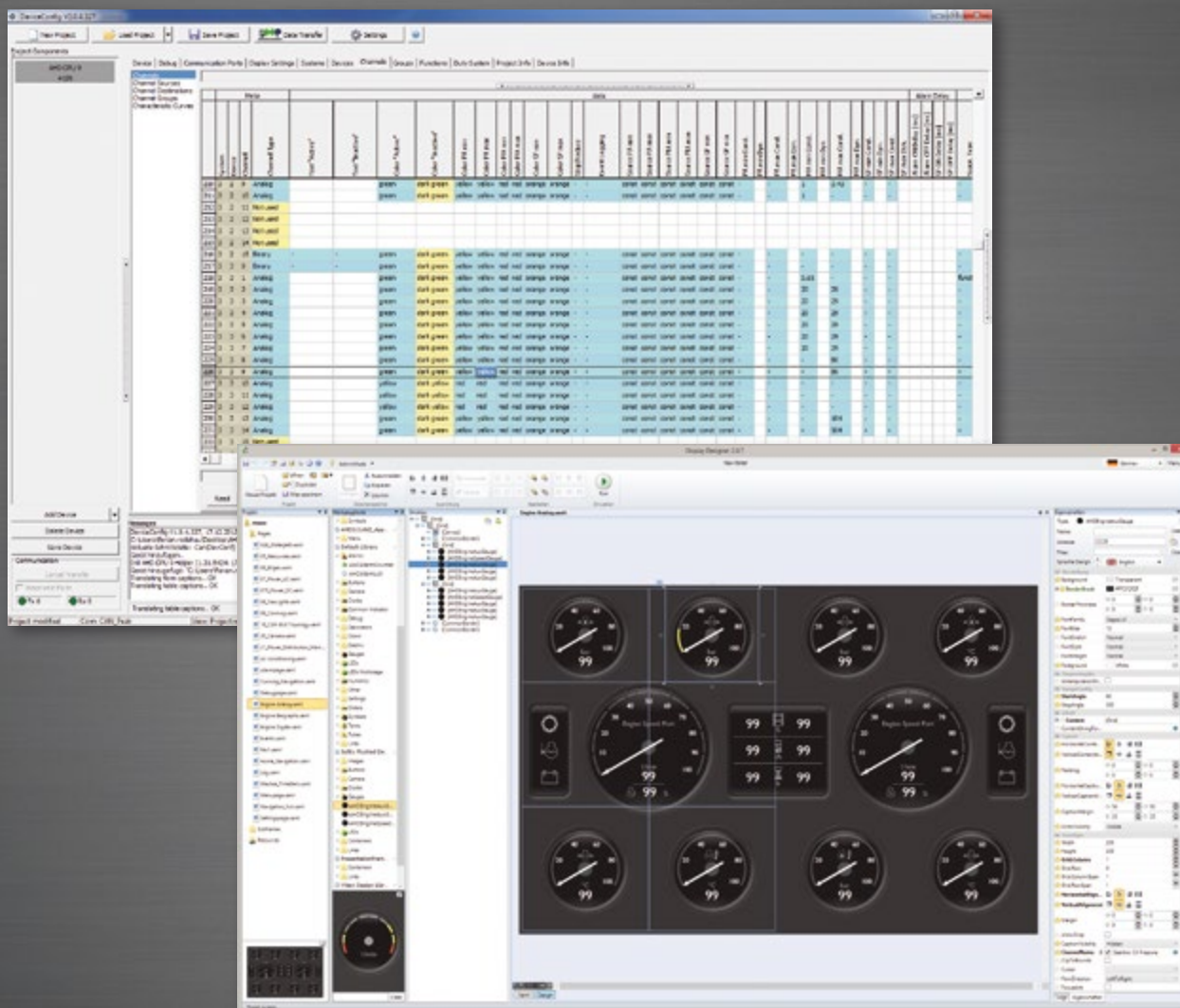
CCTV



LIGHTS



BLINDS



Configuration and Diagnostic Software

AHD-DeviceConfig is a software tool for the uniform and complete system configuration of all Böning alarm, monitoring, and control systems.

The configuration is generally based on a customer generated, project specific measuring points list.

With our configuration tool AHD-DeviceConfig, our devices and systems can be configured over a network. Additionally, firmware updates can be executed and diagnostic information can be viewed. The tool **AHD-MiniCAN** is available for further reaching diagnostics options.

With **AHD-DisplayDesigner**, individual visualization pages can be created, configured, and transferred to the devices over the network.

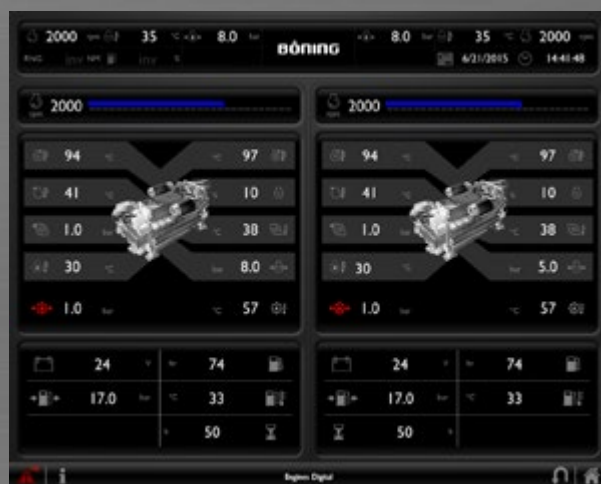
Visualization Examples

Modern ships are equipped with numerous different systems that must be monitored and controlled.

Our displays present the vessel's data visually and logically on various pages. The ship crew simply navigates the pages to view the data.



Just like in your car: The display provides information about the engine's state, using customary display systems. The engine data are displayed on round instruments and in numeric presentation.



Like having the skipper himself in the ECR:
Access to all engine data at a glance often saves a trip to the ECR.



The bar graph presentation makes for easier reading of important engine parameters, thus allowing for quick visual comparisons.



A menu page shows all available system pages with the option to launch the desired page directly.



On-board power grid monitoring, including generators and battery chargers.



Remote control for air conditioning systems, lights, and blinds on a single page, displayed in switchable deck views.



Fuel, water, oil, and other resources are carried along in tanks most of the time – as well as waste water and sewage. Bar graphs display the tanks' filling levels states. The pumps can also be controlled from this page.



Representation of the battery charge states.



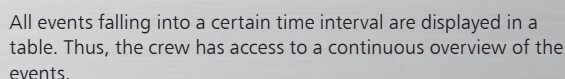
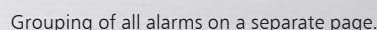
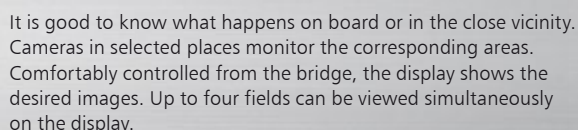
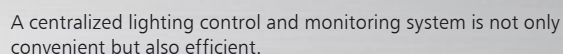
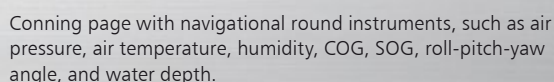
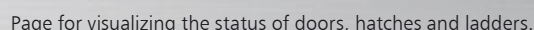
Overview of several important operational data.



Representation of a bilge system.



Navigation and signal lantern control and monitoring.



Visualizations for 8.8" Displays

The following visualization examples have been designed for the AHD 880 series displays. The graphics were created with the AHD-DisplayDesigner software with which customer specific display pages can be created.



Once the system is launched, the menu page with direct links to various pages in the system is displayed.



General engine status information, e.g. engine speed, oil pressure, and cooling water temperature are displayed on the engine page.



Visualization and control of generators and power supply.



Tank contents measuring for fuel, drinking water, grey water, and black water.



The ship's lighting system can be controlled from this page. Brightness levels can be set seamlessly with slide controllers. Preconfigured lighting groups can be switched together.



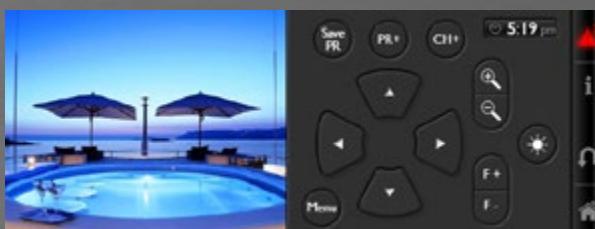
Navigation lanterns must be monitored continuously. A visualization on a display showing lantern states, error indication, and much more offers many advantages when compared to traditional displays. Combined with our navigation lantern monitoring system, an easy to use and type-approved system is at your disposal.



At a single glance: all necessary information about position, cruising speed, and heading.



Transferring fluids from one tank to another is easy and simple with a clearly organized visualization of the respective systems. Pump and valve control is designed based to the vessel's requirements.



Remote controlled cameras in selected ship locations contribute to increased safety on board. The CCTV system consists of several cameras whose images are shown on the display. Expansions, such as recording functions, are optionally available.



For increased on-board safety, the lighting in predefined areas can be conveniently switched on or off.



The visualization shows the states of the bilge pumps in the various ship areas.



An alarm page provides a list of all incoming alarms and warnings, including measuring point designation, value, and alarm time.



Language, time, and date, etc. are adjusted on the settings page.

Displays and Panel Computers for Maritime Use

All displays in our product line were designed with the goal of providing the best possible platform for graphic user interfaces.

Our displays appeal through design, intuitive operation, and individualized visualization options.

Data from external systems can be captured and processed with ports that meet the requirements of the modern maritime industry.

The monitors of the 11-series (10", 15", 19", 24") are especially suited as display devices for external sources. On the other hand, the panel PCs of the 12-series (15", 19", 24") combine the same, excellent display properties with an integrated, powerful PC system.

The displays' main functions are identical throughout the entire product line. The brightness is always matched to the ambient light, ensuring glare-free operation while cruising at night and optimum readability during sunlight. The displays can be integrated flush and watertight into consoles and switch boards.

Most displays include an integrated touch screen and can be easily operated with control panels (beginning on page 24).

Dispensing with mechanically movable parts ensures maintenance free hardware that is impact resistant and completely noiseless.

Our panel PCs also provide the option of showing the image data from external imaging sources via external inputs.





AHD 1219 G / AHD 1215 G

LCD-Panel PC-System with Glass Front and Touch Screen

Integrated panel PC system with glass front, provides a central visualization and operation platform for alarm and monitoring systems. The large 19" and 15" screens provide sufficient room for presenting complex correlations, even within the context of extensive systems. High capacity, increased functionality, and appealing design contribute to an increase in operational safety and comfort on ship bridges.

The panel PC system was developed specifically for maritime use. Dispensing with mechanically movable parts and equipping the unit with a passive cooling system secures error-free operation even under extreme conditions. The integrated PC runs on a self-contained XP Embedded® operating system. This prevents any changes during normal operation and thus, it runs with the highest degree of stability.

The excellent color graphics monitor with integrated touchscreen operation facilitates coverage of any incurring visualization and control tasks on board. High luminosities ensure the best readability even during strong sunlight. When cruising at night, automatic dimming with variable minimum brightness ensures glare-free operation.

Frontside touch fields allow for direct acknowledgement of active alarms, selection of the video source, as well as a default-setting function. The remote control units AHD DRM R (Control Unit for Color Displays and Monitors with Rotary Push Drive) or AHD DRM T (Control Unit for Color Displays and Monitors with Trackball) provide additional control options.

Version with black glass front, suitable for bulk-head or flush mounting. Alternatively, available with white glass front. (item-no. 14060)

AHD 1219 G

Inputs	1 x DVI-D In, 1x VGA In, 1 x Video-In (BNC, PAL 50 Hz), 4 x Digital IN (optocoupler)
Outputs	5 x Digital OUT (relay output)
Interfaces	6 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 2 x USB 2.0
Power supply	24 V DC (+30% / -25%)
Current consumption	2.5 A @ 24 V DC
Dimensions (W x H x D)	454 mm x 384 mm x 107 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 12 kg
Processor	1.3 GHz DualCore, 4 GB RAM, 4 GB Flash Disk
Display resolution	SXGA 1280 x 1024 pixels (5:4)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m² Best readability at all ambient light conditions
Display illumination	LED back light manually or automatically controllable
Operation temperature	-25 °C ... +55 °C (-25 °C ... +70 °C at interior console temp. of max.+45°C)
Storage temperature	-50 °C ... +85 °C (according to RMRS Part IV Section 3.10)
Approvals	GL, LR, BV, DNV, ABS, RMRS, RINA, CRS (in progress)



Large image top left:
AHD 1219 G black (item-no. 14059)

Top:
AHD 1219 G white (item-no. 14060)

Top right:
AHD 1215 G black (item-no. 14058)

Right:
AHD 1215 G white (item-no. 14057)



AHD 1215 G Deviations

Current consumption	2.1 A @ 24 V DC
Dimensions (W x H x D)	384 mm x 324 mm x 107 mm
Weight	approx. 10 kg
Display resolution	XGA 1024 x 768 pixels (4:3)
Viewing angle	Hor. 70/40°; Vert. 70/70°
Luminous intensity	approx. 1,600 cd/m²



AHD 1224 G

item-no. 14086

24" Widescreen Panel PC with Glass front

AHD 1224 G differences compared to AHD 1219 G

Current consumption	2.5 A @ 24 V DC
Dimensions (W x H x D)	620 mm x 390 mm x 107 mm
Weight	approx. 15 kg
Display resolution	Full HD 1920 x 1080 pixels (16:9)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m ² Best readability at all ambient light conditions



AHD 1200

item-no. 14486

PC System (Black box)

Blackbox computer system for console installation or flush mounting with integrated, powerful PC system, can be used for data management and visualization, as a platform for alarm and monitoring systems or as a central control system; innovative operation and visualization concept; intuitive user interface; customer specific graphics can be integrated; video functions: overlay of standard video signals or switch to DVI input; suitable for controlling the display series AHD 1115 (15"), AHD 1119 (19"), or external displays with matching resolution.

- + Robust design with passive cooling system without mechanically movable parts
- + Shock-resistant and silent
- + Electronic unit in metallic housing
- + All device connections pluggable

Inputs	4 x optocoupler input) (alarm acknowledgment, special functions optional)
Outputs	5 x relay output (switch contacts, galvanically isolated)
Interfaces	6 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 2 x USB 2.0, 1 x VGA out, 1 x DVI-D out, 1 x DVI-D in, 1 x video-in (BNC, PAL 50 Hz)
Power supply	24 V DC (+30% / -25%)
Current consumption	1.9 A @ 24 V DC
Dimensions (W x H x D)	400 mm x 320 mm x 112 mm
Degree of Protection	IP 20
Weight	approx. 10 kg
Processor	1.6 GHz DualCore, 4 GB RAM, 4 GB SSD Hard Disk, Windows XP® Embedded
Supported standard Display resolutions	SXGA 1280 x 1024 pixels (5:4) XGA 1024 x 768 pixels (4:3)
Operation temperature	-25 °C ... +55 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL



AHD 1219 F / AHD 1215 F

LCD-Panel PC-System with Foil Front

Integrated panel PC system with 19" and 15" monitor, standard version with matt black front frame.

Configuration comparable to glass front variant (item-no. 14060) automatic dimming, processes various video signals (DVI-D, VGA or PAL 50 Hz).



Large image top:
AHD 1219 F (item-no. 14067)

Left:
AHD 1215 F (item-no. 14066)

AHD 1219 F

Inputs	1 x DVI-D In, 1x VGA In, 1 x Video-In (BNC, PAL 50 Hz), 4 x Digital IN (optocoupler)
Outputs	5 x Digital OUT (relay output)
Interfaces	6 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 2 x USB 2.0
Power supply	24 V DC (+30% / -25%)
Current consumption	2.5 A @ 24 V DC
Dimensions (W x H x D)	454 mm x 384 mm x 107 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 12 kg
Processor	1.3 GHz DualCore, 4 GB RAM, 4 GB Flash Disk
Display resolution	SXGA 1280 x 1024 pixels (5:4)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m ² Best readability at all ambient light conditions
Display illumination	LED back light manually or automatically controllable
Operation temperature	-25 °C ... +55 °C (-25 °C ... +70 °C at interior console temp. of max.+45°C)
Storage temperature	-50 °C ... +85 °C (according to RMRS Part IV Section 3.10)
Approvals	GL, LR, BV, DNV, ABS, RMRS, RINA, CRS (in progress)

AHD 1215 F Deviations

Display with integrated touch surface	
Current consumption	2.1 A @ 24 V DC
Dimensions (W x H x D)	384 mm x 324 mm x 107 mm
Weight	approx. 10 kg
Display resolution	XGA 1024 x 768 pixels (4:3)
Viewing angle	Hor. 70/40°; Vert. 70/70°
Luminous intensity	approx. 1,600 cd/m ²



AHD 1119 G / AHD 1115 G

LCD Color Display with Glass Front and Touch Screen

Monitoring display with glass front, provides a central visualization and operating platform for alarm and monitoring systems. High capacity, increased functionality, and appealing design contribute to the operating safety and comfort on ship bridges. The excellent color graphics monitor with touch operation allows coverage of all incurring visualization and control tasks on board. The display was built specifically for maritime use. Dispensing with mechanically movable parts and the use of a passive cooling system ensure error-free operation even under extreme conditions. High luminosities ensure the best readability even during strong sunlight. When cruising at night, the automatic dimming with variable minimum brightness ensures glare-free operation.

AHD 1119 G / AHD 1115 G can process visualization data from various video sources, which are comfortably selected with an integrated frontside button. All touch control commands are available at the integrated USB interface and can be evaluated with a system PC. The control units AHD-DC (Control Unit for Color Displays), AHD-DRM R (Control Unit for Color Displays and Monitors with Rotary Push Drive), or AHD-DRM T (Control Unit for Color Displays with Trackball) provide additional remote control options.

Version with black glass front, suitable for bulkhead or flush mounting.

Alternatively, available with white glass front

- AHD 1119 G white (item-no. 14064)
- AHD 1115 G white (item-no. 14061)

AHD 1119 G

Inputs	1 x DVI-D In, 1x VGA In, 1 x Video-In (BNC, PAL 50 Hz)
Interfaces	2 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 2 x USB 2.0 (Touch out)
Power supply	24 V DC (+30% / -25%)
Current consumption	1.9 A @ 24 V DC
Dimensions (W x H x D)	454 mm x 384 mm x 92 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 11 kg
Display resolution	SXGA 1280 x 1024 pixels (5:4)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m ² Best readability at all ambient light conditions
Display illumination	LED back light manually or automatically controllable
Operation temperature	-25 °C ... +55 °C (-25 °C ... +70 °C at interior console temp. of max.+45°C)
Storage temperature	-50 °C ... +85 °C (according to RMRS Part IV Section 3.10)
Approvals	GL, MED compliant



Large image top left:
AHD 1119 G black (item-no. 14063)

Top:
AHD 1119 G white (item-no. 14064)

Top right:
AHD 1115 G black (item-no. 14062)

Right:
AHD 1115 G white (item-no. 14061)



AHD 1115 G Deviations

Current consumption	1.7 A @ 24 V DC
Dimensions (W x H x D)	384 mm x 324 mm x 92 mm
Weight	approx. 10 kg
Display resolution	XGA 1024 x 768 pixels (4:3)
Viewing angle	Hor. 70/40°; Vert. 70/70°
Luminous intensity	approx. 1,600 cd/m ² Best readability at all ambient light conditions



AHD 1119 F / AHD 1115 F

LCD Color Display with Foil Front

Monitoring display, standard version with matte black front frame.

Configuration nearly identical to glass front variant (see item-no. 14063).



Large image top:
AHD 1119 F (item-no. 14070)

Left:
AHD 1115 F (item-no. 14069)



AHD 1110 F

item-no. 15288

LCD Color Display with Foil Front and Touch Screen

Compact monitoring display, standard version with matte black front frame.

AHD 1119 F

Inputs	1 x DVI-D In, 1x VGA In, 1 x Video-In (BNC, PAL 50 Hz)
Interfaces	2 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 2 x USB 2.0 (Touch out)
Power supply	24 V DC (+30% / -25%)
Current consumption	1.9 A @ 24 V DC
Dimensions (W x H x D)	454 mm x 384 mm x 92 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 11 kg
Display resolution	SXGA 1280 x 1024 pixels (5:4)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m ² Best readability at all ambient light conditions
Display illumination	LED back light manually or automatically controllable
Operation temperature	-25 °C ... +55 °C (-25 °C ... +70 °C at interior console temp. of max.+45°C)
Storage temperature	-50 °C ... +85 °C (according to RMRS Part IV Section 3.10)
Approvals	GL, MED compliant

AHD 1115 F Deviations

Display with integrated touch surface	
Current consumption	1.5 A @ 24 V DC
Dimensions (W x H x D)	384 mm x 324 mm x 92 mm
Weight	approx. 9 kg
Display resolution	XGA 1024 x 768 pixels (4:3)
Viewing angle	Hor. 70/40°; Vert. 70/70°
Luminous intensity	approx. 1,600 cd/m ² Best readability at all ambient light conditions

AHD 1110 F Deviations

Inputs	1 x DVI-D In, 1x VGA In, 1 x Video-In (BNC, PAL 50 Hz)
Interfaces	2 x CAN (galvanically isolated), 1 x RS-232, 2 x LAN, 1 x USB 2.0 (Touch out)
Power supply	24 V DC (+30% / -25%)
Current consumption	2.0 A @ 24 V DC
Dimensions (W x H x D)	280 mm x 240 mm x 107 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 7 kg
Display resolution	XGA 1024 x 768 pixels (4:3)
Viewing angle	Hor. 89/89°; Vert. 89/89°
Luminous intensity	approx. 1,000 cd/m ² Best readability at all ambient light conditions
Display illumination	LED back light manually or automatically controllable
Operation temperature	-25 °C ... +55 °C (-25 °C ... +70 °C at interior console temp. of max.+45°C)
Storage temperature	-50 °C ... +80 °C (according to RMRS Part IV Section 3.10)



AHD 880 G

item-no. 14369

8.8" Transflective Display with Glass Front and Touch Screen

The color display series AHD 880 G combines high performance and functionality in a compact design with attractive glass front. It was developed specifically for maritime use. Dispensing with mechanically movable parts and using a passive cooling system ensures error-free operation even under extreme conditions.

This makes the device equally suitable for outdoor use. Due to its compact design, it can be installed at any location where ship data should be visualized or alarmed (e. g. open or closed bridge, wing control helms, engine room, mess, or cabins).

The display can also be used as a central presentation platform for alarm and monitoring systems. An integrated, latest-generation touchscreen sensor guarantees convenience and ease of operation. All stored functions are configured according to the requirements. Every control relevant aspect of the ship can be displayed in a clearly organized manner on its own page. The visualization of status messages, measured values, and general alarm statuses is distributed across various graphic or tabular pages. Device in aluminum die-cast housing; suitable for installation in consoles or switchboards.

Transflective display technology with brilliant display, wide viewing angle, and full sunlight readability; luminosity 250 cd/m² with automatic brightness control; integrated input for processing image or camera signals; serial port for capturing GPS data; connection for remote control unit AHD 650 R; buzzer and relay contact for external signal devices.

Alternatively, available with white glass front

- AHD 880 G white (item-no. 14370)

AHD 880 TC G (including AHD 880 TC and AHD 880 E)

Inputs	1 x optocoupler input (Alarm acknowledgment)
Outputs	2 x relay output (Horn, alarm, galvanically separated)
Interfaces	3 x CAN (galvanically isolated), 1 x RS-232 (GPS), 1 x Video-In (PAL 50 Hz), 1 x RC (AHD 650 R)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.7 A @ 24 V DC
Dimensions (W x H x D)	270 mm x 130 mm x 79 mm
Degree of Protection	IP 56 (front) IP 20 (rear)
Weight	approx. 2.2 kg
Display resolution	640 x 240 pixels (8:3)
Luminous intensity	approx. 250 cd/m² transreflective, Best readability at all ambient light conditions
Operation temperature	-30 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Approvals	GL, LR (TC and E only)



AHD 880 TC

item-no. 11413

8.8" Transflective Display with Foil Front and Touch Screen

Standard version with matte black front frame. Configuration nearly identical to glass front variant AHD 880 G (see item-no. 14369).



AHD 880 E

item-no. 13125

8.8" Engine Display with FoilFront and Touch Screen

The AHD 880 E touch screen engine color display was developed as an engine display for display and alarm presentation of attached engine systems' relevant operating data.

Communication occurs via CAN bus. Interfaces for various data protocols (e. g. SAE J1939, Modbus, NMEA 0183, NMEA 2000), with which the data of major engine manufacturers (e. g. MAN, MTU, Caterpillar, Volvo-Penta, Cummins) can be processed, are available.

Measured values are presented on various instrument pages. Separate page areas are provided for displaying status messages and alarm statuses. The integrated touch screen sensor ensures convenience and ease of operation.

Alternatively, available with white glass front

- AHD 880 E white (item-no. 10549)



Visualization prepared for

- Dual engine system MAN CR – 1st gen.

Alternative versions:

- MAN CR – 2nd gen.
- MAN EDC
- CAT
- MTU
- Others on request



AHD 430

item-no. 15165

4.3" Colour display with Glass Front and Touch Screen

The display AHD 430 with integrated touch operation was specially designed for marine applications. A compact design allows the installation wherever ship data need to be visualized or alarmed, particularly in places with reduced installation space, as for example cabins or in the mess.

The display serves as graphical or tabular presentation platform for alarm and monitoring systems with custom-designed visualization pages. Current alarm conditions are displayed on a separate page.

Device in aluminum housing, suitable for console or switchboard installation.

Interfaces	2 x CAN (galvanically isolated), 1 x RS-485 (GPS)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.2 A @ 24 V DC
Dimensions (W x H x D)	130 mm x 90 mm x 30 mm
Degree of Protection	IP 56 (front) IP 20 (rear)
Weight	approx. 0.5 kg
Display resolution	480 x 272 pixels (horizontal), 272 x 480 pixels (vertical)
Viewing angle	Hor. 65/65°; Vert. 50/60°
Luminous intensity	1,000 cd/m ²
Display illumination	LED back light automatically dimmed
Operation temperature	-30 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C



AHD 651

item-no. 11202

6.5" Color Display with Foil Front

The display AHD 651 was specially designed for marine applications, an according design ensures error-free operation even in outdoor areas. A compact design allows the installation wherever ship data need to be visualized or alarmed (e. g. open or closed bridge, wing control stand, engine room, mess, or cabins).

Device in aluminum housing, suitable for console or switchboard installation.

Inputs	1 x optocoupler input (Alarm acknowledgment)
Outputs	2 x relay output (Alarm, horn, galvanically separated)
Interfaces	2 x CAN (galvanically isolated), 1 x RS-232 (GPS) 1 x RC (AHD 650 R)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.45 A @ 24 V DC
Dimensions (W x H x D)	210 mm x 130 mm x 95 mm
Degree of Protection	IP 67 (front) IP 67 (rear)
Weight	approx. 1.5 kg
Display resolution	400 x 240 pixels (16:10)
Luminous intensity	200 cd/m ² (reflective) Best readability at all ambient light conditions
Display illumination	LED back light, transreflective, automatically dimmed
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR



Display Control Units

AHD-DC R

item-no. 15867

Control Unit with Rotary Push Drive for Displays

Control panel for operating Böning displays with and without PC system, beginning with series AHD 11xx or AHD 12xx; suitable for use with integrated bridges or other multi-display systems. As a central command unit, AHD-DC R can conveniently assign menu navigation control to the desired display; up to 10 displays can be managed. The device can be combined with AHD-DRM T.

Further description see AHD-DRM R (page 25).



AHD-DC R

Interfaces	1 x CAN (Control CAN)
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 74 mm
Degree of Protection	IP 65 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-DC

item-no. 13290

Control Unit for Selecting and Operating Displays

Control panel for selecting and operating Böning displays with or without PC system, beginning with the series AHD 1015 or AHD 1019; suitable for use with integrated bridges or other multi-display systems; as a central command unit, AHD-DC can conveniently assign menu navigation control to the desired display; up to 10 displays can be managed. At the same time, integrated cursor control keys allow for navigating and launching functions on the selected system.

Additional control elements:

- + Direct switching to the main menu
- + Acoustic and optical alarm acknowledgement
- + Selecting the display's signal source
- + Selection of displays in integrated bridges

Can be combined with control units AHD-DRM T (trackball) or AHD-DRM R (rotary push drive); electronics unit in metal housing for installation in consoles, switchboards, and arm rests; illuminated control elements and status displays automatically dimmed; pluggable device connections.

AHD-DC

Interfaces	1 x CAN (control CAN)
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 66 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-15 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-DRM T

item-no. 13287

Control Unit with Trackball for Displays

Control panel for operating Böning displays with and without PC system, beginning with series AHD 1015 or AHD 1019; suitable in connection with integrated displays or remote control of individual displays. AHD-DRM T allows for convenient menu navigation control via trackball and additional function keys.

Additional control elements:

- + Direct switching to the main menu
- + Acoustic and optical alarm acknowledgement
- + Selecting the display's signal source

Electronics unit in metal housing for installation in consoles, switchboards, and armrests; illuminated operating elements and status displays automatically dimmed; pluggable device connection.

AHD-DRM T

Interfaces	1 x CAN (control CAN)
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 74 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-15 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-DRM R

item-no. 13281

Control Unit with Rotary Push Drive for Displays

Control panel for operating Böning displays with and without PC system, beginning with series AHD 1015 or AHD 1019; suitable in connection with integrated displays or remote control of individual displays. AHD-DRM R allows for convenient menu navigation control via a combined rotary push drive and additional function keys.

Additional control elements:

- + Direct switching to the main menu
- + Acoustic and optical alarm acknowledgement
- + Selecting the display's signal source

Electronics unit in metal housing for installation in consoles, switchboards, and armrests; illuminated operating elements and status displays automatically dimmed; pluggable device connection.

AHD-DRM R

Interfaces	1 x CAN (control CAN)
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 74 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD 650 R

item-no. 10498

Remote Control Unit for 6.5" and 8.8" Displays

Remote control unit for 6.5" and 8.8" color displays, series AHD 651 and AHD 880.

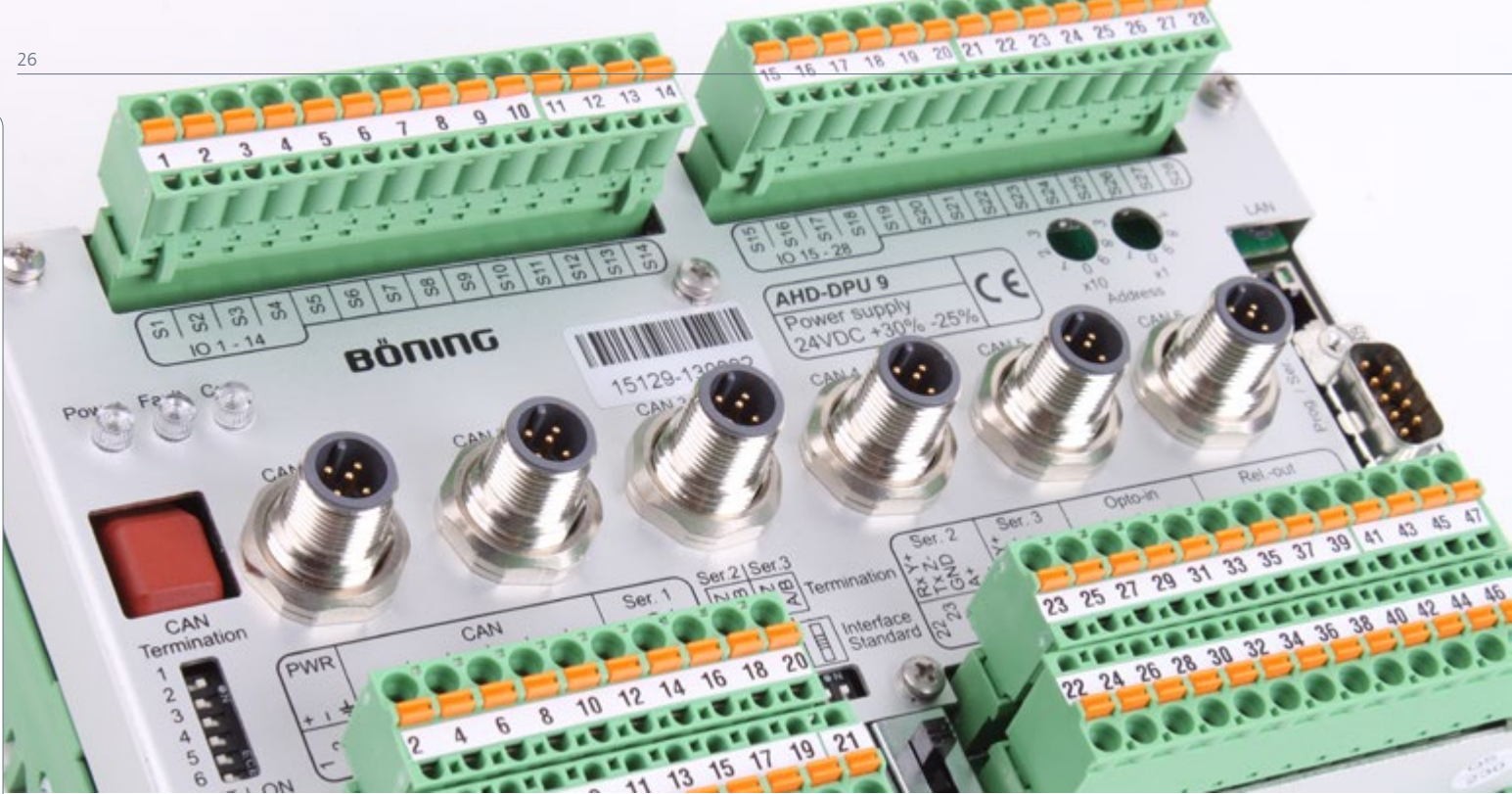
Compact unit for launching all display functions:

- + Menu launching
- + Switching pages
- + and alarm acknowledgement

Electronics unit in metal housing for installation in consoles, switchboards, and armrests; illuminated and dimmed operating elements; pluggable device connection.

AHD 650 R

Interfaces	1 x 8-Pin digital (display remote connector)
Power supply	24 V DC (+30% / -25%)
Current consumption	10 mA @ 24 V DC
Dimensions (W x H x D)	40 mm x 130 mm x 41 mm
Degree of Protection	IP 67 (front) IP 55 (rear)
Weight	approx. 0.2 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR



Data Stations, Control and Switching Units

and binary signals. Here, pluggable input modules for each channel allow for the highest degree of flexibility. Direct alerting occurs via 4 potential free contacts, for horn control and general alerting, among others.

Integrated interfaces for binary data stations of the AHD-PS series capture up to 94 additional channels, if necessary. In addition, a relay station AHD-R 101 with 15 changeover contacts can be directly controlled.

The standard version of AHD-SAS 15 is suitable for carrier rail mounting (TS32/35), or as a special version, for bulkhead installation (item-no. 10786).

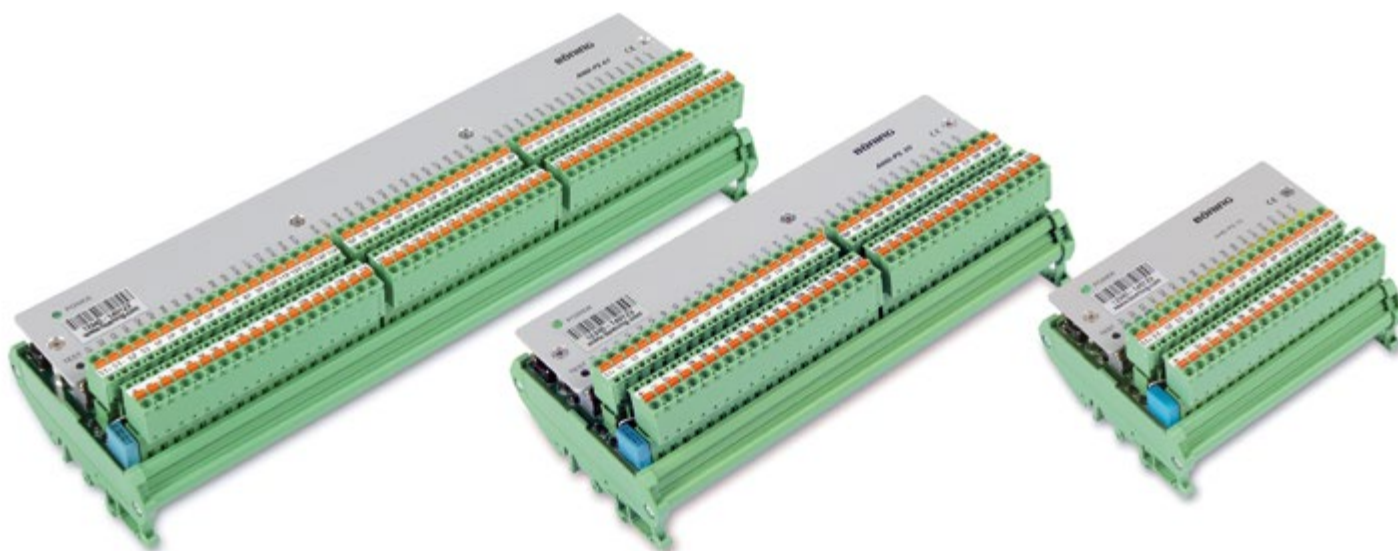


AHD-SAS 15 item-no. 11663

15 Channel Analog Data Capture

Data station with 15 input channels, suitable for capturing current, power, and resistor sensors, changeover contacts, thermo elements, (e. g. NiCrNi), pulse generators, and other sensor types. The integrated processor system allows for the autarkic processing and monitoring of analog

Inputs	15 x analog input, sensor type modular pluggable: 4-20 mA, 0-5 V, 0-30 V, 0-45 V, PT100, PT1000, NiCrNi, frequency, switch etc. 3 x optocoupler input: 2 x serial (e.g. AHD-PS 15/30/47), 1 x alarm acknowledgment (optical/acoustic)
Outputs	2 x optocoupler output serial (e.g. for AHD-R 101) 4 x relay output (horn, collective alarm 2 x configurable)
Interfaces	2 x CAN (galvanically isolated), 1 x serial (RS-232)
Power supply	24 V DC (+30% / -25%)
Current consumption	520 mA @ 24 V DC
Dimensions (W x H x D)	210 mm x 125 mm x 84 mm
Degree of Protection	IP 20
Weight	approx. 0.7 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, DNV, ABS



AHD-PS 47

item-no. 10864

47 Channel Binary Data Capture

Binary data station for the decentralized capture of 47 sensors (contacts, transistor outputs, proximity switches, etc.), serial data output to higher ranking system components (AHD 882, AHD-SAS 15, or AHD-DPU), inputs and outputs optically decoupled, integrated status displays, 1 or 2 pin connection of sensors possible, electronics unit in profile carrier housing, suitable for carrier rail mounting (TS32/35).

Inputs	47 x optocoupler input (for changeover contacts, optocoupler outputs, 1- or 2-pin connectible)
Outputs	3 x optocoupler output, serial: dipolar, galvanically isolated, open emitter (plus switched), open collector (minus switched)
Power supply	24 V DC (+30% / -25%)
Current consumption	50 mA @ 24 V DC
Dimensions (W x H x D)	281 mm x 90 mm x 53 mm
Degree of Protection	IP 10
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, DNV, CRS, ABS

AHD-PS 30

item-no. 10375

30 Channel Binary Data Capture

Similar to AHD-PS 47, but with 30 channels.

Inputs	30 x optocoupler input (for changeover contacts, optocoupler outputs, 1- or 2-pin connectible)
Current consumption	30 mA @ 24 V DC
Dimensions (W x H x D)	193 mm x 90 mm x 53 mm
Weight	approx. 0.35 kg

AHD-PS 15

item-no. 10882

15 Channel Binary Data Capture

Similar to AHD-PS 47, but with 15 channels.

This device can be used as a parallel-serial converter for reducing the cabling in spatially separate systems (in conjunction with AHD-R 101).

Inputs	15 x optocoupler input (for changeover contacts, optocoupler outputs, 1- or 2-pin connectible)
Current consumption	25 mA @ 24 V DC
Dimensions (W x H x D)	113 mm x 90 mm x 53 mm
Weight	approx. 0.2 kg



AHD-AO 6

item-no. 14652

6 Channel Analog Output Unit

AHD-AO 6 is a 6-channel output unit for the generation of analog voltages or currents.

The integrated high-precision analog output converters are galvanically isolated. Each output signal can be configured within standardized limit values, thus allowing an uncomplicated integration into third-party systems.

Outputs	6 x analog output (current 0-20 mA, 4-20 mA, 0-24 mA or voltage 0-5 V, 0-10 V)
Interfaces	2 x CAN (galvanically isolated), 1 x serial (extension modules)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.4 A @ 24 V DC
Dimensions (W x H x D)	147 mm x 125 mm x 52 mm
Degree of Protection	IP 10
Weight	approx. 0.55 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-UCC

item-no. 13871

Universal CAN Converter

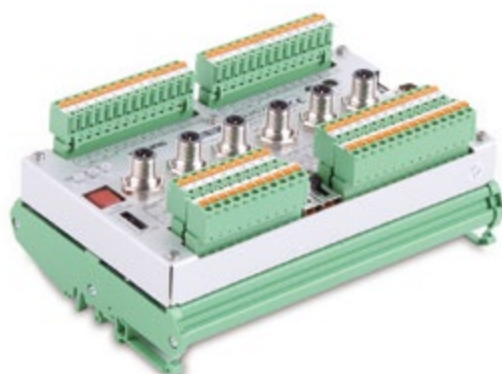
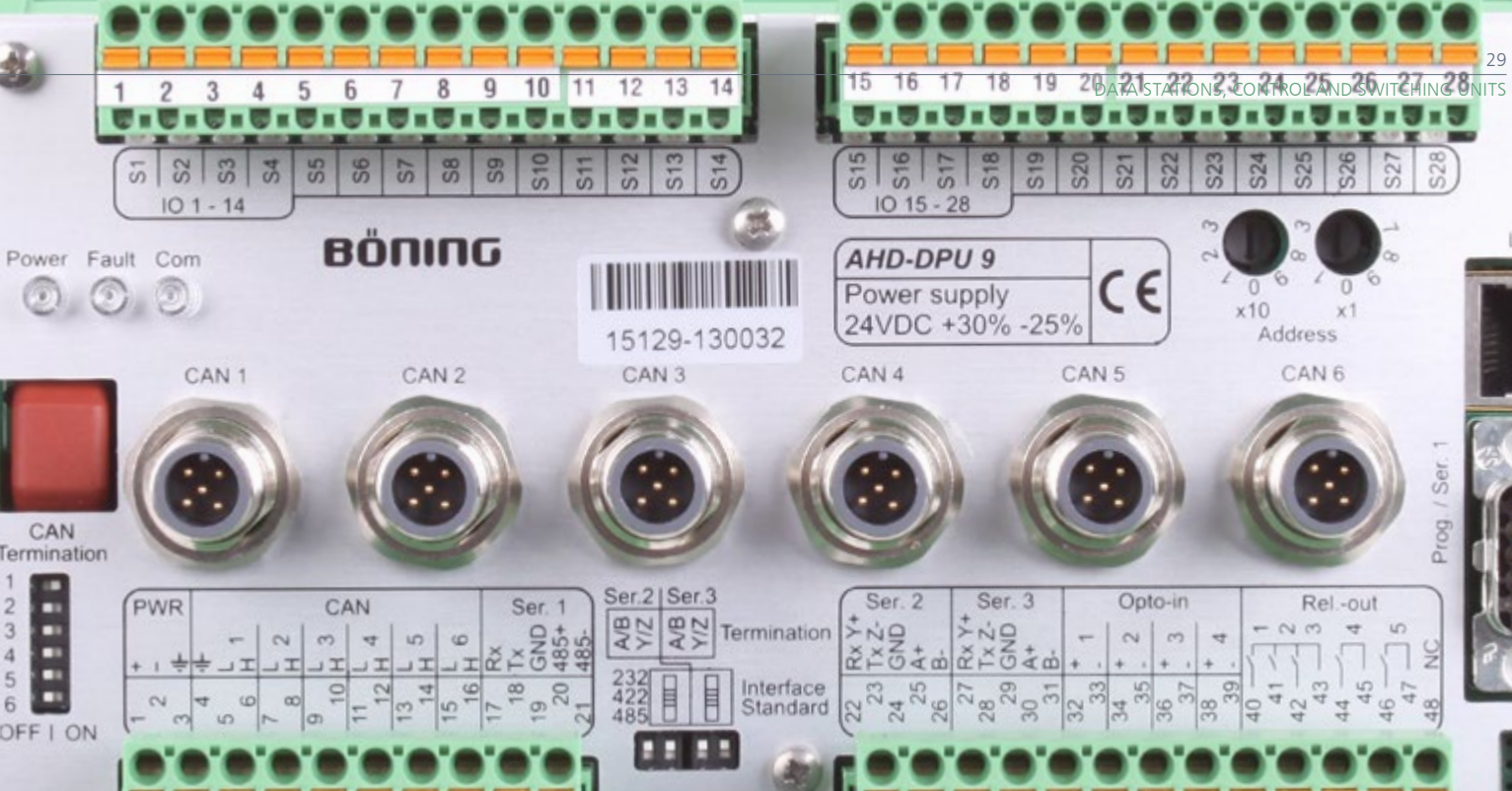
Converter for communication with external CAN bus networks. The device allows for connecting external systems to the Bönning AHD-SAS CAN bus network. For this, a number of adapted communication protocols are already available.

AHD-UCC is NMEA 2000® (listen only) certified. CAN bus networks galvanically isolated, electronics unit in closed metal housing with flange mounting.

Also available as a CAN repeater for SAS CAN bus networks (item-no. 13223). This is required for systems with greater cable lengths.

- Available data protocols:
- + **Engine controls**
Caterpillar, Cummins, MAN, MTU, Scania, Volvo
 - + **Generators**
Onan, Kohler, Fischer Panda
 - + **Battery chargers**
Mastervolt
 - + **Other systems**
anchor control, offshore systems,
Dometic air conditioning systems,
Furuno, Bosch Rexroth BODAS
 - + **Others on request**

Interfaces	1 x CAN (AHD-SAS bus, galvanically isolated), 1 x CAN (external systems: NMEA 2000®, SAE J1939, galvanically isolated)
Power supply	24 V DC (+30% / -25%)
Current consumption	55 mA @ 24 V DC
Dimensions (W x H x D)	140 mm x 82 mm x 44 mm
Degree of Protection	IP 56
Weight	approx. 0.45 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL



AHD-DPU 9

item-no. 15129

Data Processing Unit

Powerful logic unit for integrated ship alarm, monitoring, and control systems. It can capture and process all data accruing in the board system. This includes the evaluation of all integrated sensors captured via analog or binary data stations.

Every measuring point is monitored under consideration of various parameters and can be alerted, if thresholds are exceeded. All data are available in the Böning SAS bus and can be displayed with matching Böning displays (e. g. AHD 1215).

AHD-DPU 9 supports mathematic and logical operations (SPS functions).

An integrated logging function records all events. Thus, any status messages or the watch standby status can be logged. The last 16,000 can be viewed at any time.

Various ports (including LAN) support its integration into the ship's existing infrastructure. AHD-DPU 9 is NMEA 2000® certified.

Inputs	4 x optocoupler input (alarm acknowledgment, special function optional)
Outputs	5 x relay output (galvanically isolated, 2 x contact 2-pin, 3 x contact 1-pin)
Combined in/out	28 x optocoupler channel (bidirectional), can be used as input or output, for serial data exchange or switch function
Interfaces	6 x CAN (galvanically isolated, termination and address switchable), LAN (RL45, 10/100 Mbit), 2 x serial (RS-232/RS-485/RS-422), 1 serial (RS-232/485) switchable, bus termination switchable
Power supply	24 V DC (+30% / -25%)
Current consumption	170 mA @ 24 V DC
Dimensions (W x H x D)	188 mm x 126 mm x 63 mm
Degree of Protection	IP 20
Weight	approx. 0.7 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL



AHD-R 101

item-no. 14754

15 Channel Relay Station

Relay output station with 15 changeover contacts, adapted for the serial transmission of data stations or central control units, such as AHD-DPU 9 or AHD 882 (for controlling AHD-SAS 15, see item no. 15315 or 15463).

- + Control of pumps, engines, pilot lamps, room lighting, or other actuators
- + Transmission of status messages to external systems (potential free changeover contacts)
- + Use as a serial-parallel converter for reducing the cabling in spatially separated systems (in conjunction with AHD-PS 15)
- + Integrated LEDs as status indicators

Alternate versions:

- **AHD-R 101 (AHD 882 Hold/Classifiable)**
saves relay state after data loss
(item-no. 14753)
- **AHD-R 101 (AHD 882 DoubleSerial/Redundant)**
for redundant systems (item-no. 14757)
- **AHD-R 101 (CustomConfig)**
customer specific configuration (item-no. 14757)
- **AHD-R 101 (SAS-15 Hold/Classifiable)**
like item no. 14753, but for
AHD-SAS 15 (item-no. 15315)
- **AHD-R 101 (SAS-15 NoHold)**
like item no. 14754, but for
AHD-SAS 15 (item-no. 15463)

Inputs	2 x optocoupler input (serial 1, serial 2)
Outputs	15 x relay output (changeover contact, galvanically isolated), 230 V AC, 3 A or 30 V DC, 2 A (channel 15 = error message)
Power supply	24 V DC (+30% / -25%)
Current consumption	320 mA @ 24 V DC
Dimensions (W x H x D)	147 mm x 112 mm 55 mm
Degree of Protection	IP 10
Weight	approx. 0.55 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, DNV



AHD-UIC

item-no. 11334

Serial CAN Protocol Converter

(Basic version, 2 x RS-485 without configuration)

Universal interface converter for communicating with external ports such as RS-485/RS-422 or RS-232.

This device allows external systems to be connected to the Böning AHD-SAS CAN bus network.

A number of adapted communication protocols are already available for this. Other system specific protocols can be configured on request.

- + Reactionless capture and conversion of analog and binary data
- + Cyclical processing of up to 100 Modbus data packets
- + Configurable data capture
- + Redundant system available in combination with two devices (master/slave)

Versions with alternative ports:

- **AHD-UIC with 1 x RS-485, 1 x RS-422**
(item no. 13790);
- **AHD-UIC with 2 x RS-422**
(item no. 13800)

Versions with preconfigured protocols for:

- + **Main engines**
(MAN, MTU, Volvo, ComAp, SymAp),
- + **Battery chargers**
(Mastervolt, Victron Energy [DC], Deif [AC])
- + **Fire monitoring**
(Kentech, Consillium)
- + **Lighting control** (Cantalupi)
- + **Stabilizers**
(ABT, Slepner, Trac),
- + **Generators** (CAT)
- + **Miscellaneous** (Maxwell)

Interfaces	2 x RS-485/RS-422 (isolated), 1 x CAN, 1 x RS-232, data rates up to 38,400 baud
Power supply	24 V DC (+30% / -25%)
Current consumption	85 mA @ 24 V DC
Dimensions (W x H x D)	135 mm x 130 mm x 55 mm
Degree of Protection	IP 20
Weight	approx. 0.35 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR



AHD-RB 6

item-no. 14205

Electronic Circuit Breaker

Electronic remote controlled circuit breaker (ECB) for securing up to six independent users.

All load circuits are switched in a dipolar manner. The maximum connection load is 16 or 28 Amperes at an on-board voltage of 24 V. The unit is controlled remotely via the existing system bus or separate control inputs which also allow “standalone” operation.

When used for lighting control, the outputs can be regulated continuously (dimmer function). The tripping threshold can be set freely for each channel. Short circuits and other error states are detected and reported to the central alarm unit.

Each circuit breaker is equipped with integrated emergency operation, allowing for the independent addition or deletion of each user, even in case of error.

Tripping characteristic type B.

Alternative version:

- Tripping characteristic type C (item-no. 14708)

Inputs	Central feed: 2-pin 125 A, 6 switch inputs (direct control)
Outputs	6 circuit breaker outputs, 16 A ea. or 4 circuit breaker outputs, 16 A ea. and 1 circuit breaker output, 28 A or 2 circuit breaker outputs, 28 A ea. and 2 circuit breaker outputs, 16 A ea.
Fuse	max. release current switchable 6.3, 10, 16 or 28 A (dual channel), available with tripping characteristics type B or C, current monitoring starting at 50 mA, release current configurable
Interfaces	CAN bus (Böning bus), NMEA 2000® on request
Power supply	24 V DC (+30% / -25%)
Current consumption	220 mA @ 24 V DC
Dimensions (W x H x D)	219 mm x 125 mm x 70 mm
Degree of Protection	IP 20
Weight	approx. 1.6 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-CUC

item-no. 13291

CAN-USB Converter

CAN-USB control for transmitting mouse and keyboard commands to external systems.

Normally, external PC systems whose visual data output is meant to be integrated with the Böning system (e. g. navigation systems) are connected via this device.

Within an integrated bridge system, devices are mostly operated with the control units AHD-DC, AHD-DC R, AHD-DRM R, or AHD-DRM T. The commands thus issued are sent to the Böning PCs via a common control bus and via the AHD-CUC also to the external systems. Thus, all participating PC systems can be conveniently controlled via a common user interface. Depending on the configuration, the command transfer can also occur based on the selected video data source.

Interfaces	1 x CAN (AHD-SAS, control CAN bus), 1 x USB 2.0 (supports Windows XP®, Windows 7® support in preparation)
Power supply	24 V DC (+30% / -25%)
Current consumption	30 mA @ 24 V DC
Dimensions (W x H x D)	93 mm x 125 mm x 89 mm
Degree of Protection	IP 20
Weight	approx. 0.25 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-30 °C ... +85 °C



AHD 882

item-no. 10390

Central Unit

Up to 18 serial input channels gather information from external data stations (e. g. AHD-PS 15, 30, or 47) or alternative data sources. In addition to the binary information, analog data from the SAS bus (CAN) can also be processed. A total of 846 processing channels are possible.

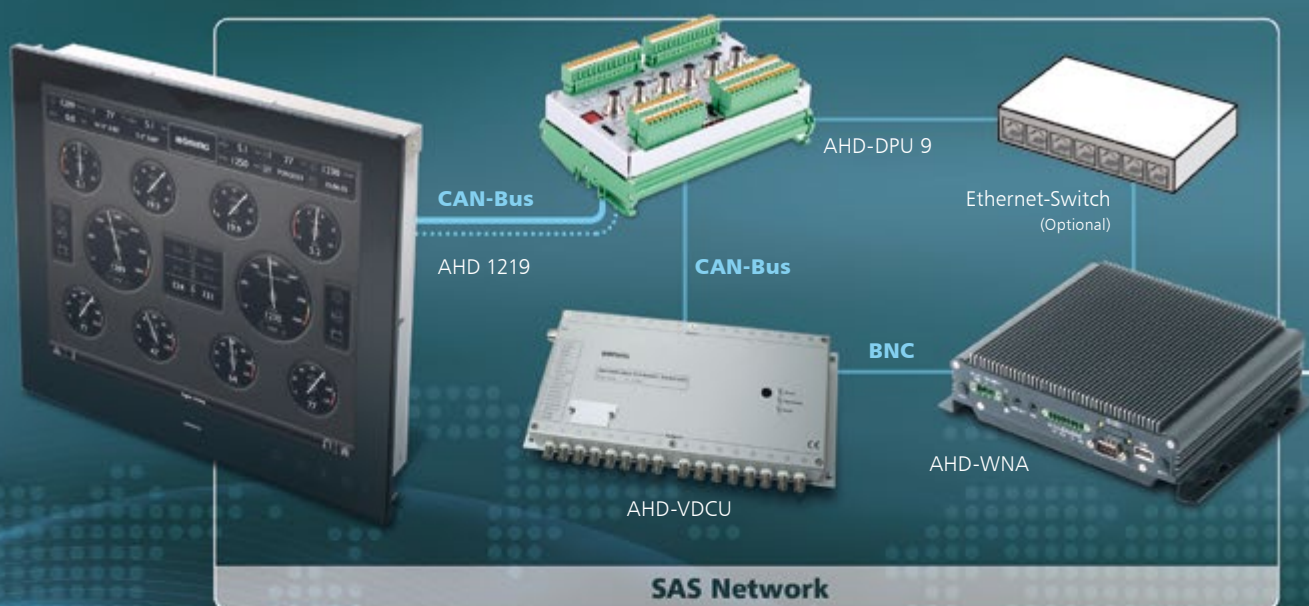
16 output channels are available for transmitting message data or control groups. These can control e. g. binary alarm panels, such as AHD 406-2, or relay units (e. g. AHD-R 101), directly and thus trigger switch or control processes.

All processed data can be distributed or grouped as desired with a powerful configuration tool.

The integrated logging function saves up to 10,000 events. These can be accessed with a service computer via the integrated RS-232 port.

As a special function, a log printer can be controlled.

Inputs	18 x optocoupler input (static or serial), 2 x alarm acknowledgment (optical and acoustic)
Outputs	16 x transistor output short-circuit proof, static or serial (open-collector)
Interfaces	2 x CAN (galvanically isolated), 1 x serial (RS-232), 7 x relay outputs (5 x group alarm, 1 x collective alarm, 1 x horn relay)
Power supply	24 V DC (+30% / -25%)
Current consumption	125 mA @ 24 V DC
Dimensions (W x H x D)	216 mm x 125 mm x 71 mm
Degree of Protection	IP 10
Weight	approx. 0.6 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, DNV



Desktop-PC | Notebook | Tablet | Smartphone



Router

Home Network
Router

Remote Monitoring and Fault Detection



AHD-WNA

Internet Access to Böning Systems

AHD-WNA allows for viewing the vessel's current data and sending commands to the ship system from any location with Internet access.

Using an Ethernet port, AHD-WNA is integrated into the ship's bus system via a Panel PC AHD 1215 F, AHD 1215 G, AHD 1219 F, AHD 1219 G, or Data Station AHD-DPU 9; an additional port establishes the connection to the operator provided Internet access (data rate 3G or higher).

The user accesses AHD-WNA with a web browser, which provides the ship's data visualization and controls, known from the ship's Böning displays, via remote access. This ensures the customary fast and secure operation.

To ensure the vessel's safe operation, safety relevant functions, such as starting and stopping the engine, cannot be opened.

Access to AHD-WNA is password protected. AHD-WNA secures data traffic with the user by means of the known to be secure AES256 encryption protocol.

Already existing Böning systems can be retrofitted with AHD-WNA.



AHD-WNL

Mobile iPad® Connectivity and Logging

AHD-WNL (Web and Log) integrates the iPad®, iPhone®, iPod®, and other clients seamlessly into the ship's Böning monitoring and control system. The user can access the ship's data and – with the corresponding rights – controls at any time in the WLAN board network. The visualization on the clients matches the visualization on the ship's displays, thus ensuring familiar, safe operation.

AHD-WNL logs the Böning system's data according to configured channels and exports them in flexible file formats. AHD-WNL consists of a PC with the AHD-WNL server installed there. A 12xx-series panel PC or data station AHD-DPU 9 connect AHD-WNL to the ship's Böning system. With it, all data can be visualized. The connection to the ship's WLAN is established via a user provided WLAN router or an already installed WLAN on board.

User management data, visualization of supported devices, and logging are stored on the AHD-WNL server. Configuration and logging data can simply be accessed over a web interface that is compatible with most common browsers.

In the user management, the extent of each user's access to the vessel's data and controls is set up during delivery and according to the customer's wishes. Thus, e. g. guests may be permitted to know the ship's location and cruising speed or switch the cabin lighting on or off.

Standard pages that can be matched to the individual presentation on the ship displays with the most important functions are available for the visualization on clients. On request, pages matching the individual presentation on the ship displays can be created. Existing Böning systems can be retrofitted with AHD-WNL. AHD-WNL can also be accessed from the Internet.

Only under certain conditions AHD-WNL is intended for use in commercial shipping. Supported clients: iPad®, generation 2 and later; iPhone®, generation 4 and later; iPod® Touch, generation 4 and later; PCs and laptops with Microsoft Windows®, Windows XP SP3 and later.

Supported clients	iPad®, generation 2 and later; iPhone®, generation 4 and later; iPod® Touch, generation 4 and later; PCs and laptops with Microsoft Windows®, Windows XP SP2 and later
Power supply	9 ... 36 V DC
Power consumption	60 W
Battery supply	Integrated, sufficient for 10 minutes
Degree of Protection	IP 20
Operation temperature	-40 °C ... +70 °C
Storage temperature	-40 °C ... +80 °C



AHD-IAMCS

Visualizing Software for AHD-WNL

In conjunction with AHD-WNL on the board WLAN, AHD-IAMCS (Integrated Alarm, Monitoring and Control system), available at the Apple App Store for free. It allows access to the ship's data and controls with the clients iPad®, iPhone® and iPod®. The visualization, matched to the presentation on the ship displays, ensures operational safety, thus making AHD-IAMCS a fully valid component of the Böning monitoring and control system.

The ship's data are displayed and access to the controls is enabled according to the user rights stored in AHD-WNL. The ship specific configuration data for the graphic visualization are transferred by AHD-WNL to the clients one time during logon. The ship's data are continuously transferred to the client, allowing real-time and safe control and management everywhere and at any time on board.

Many standard pages are available for the most common data and control functions, e. g. tanks, bilge pump monitoring and control, and many more. At the customer's request, pages matched to the specific presentation on the ship's displays can be created.

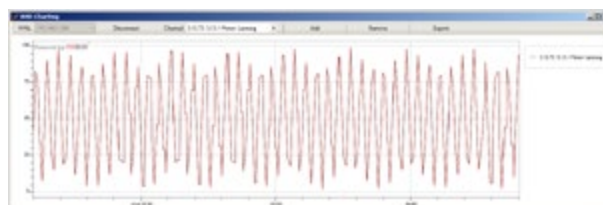
For Apple iOS®, Version 5 and later



AHD-Charting

Graphical Presentation of AHD-WNL Logging Data

AHD-Charting complements the AHD-WNL installed on board. AHD-WNL logs the data of ship system channels set up during the system configuration, allowing their export to Microsoft Excel® and viewing on the vessel's displays.

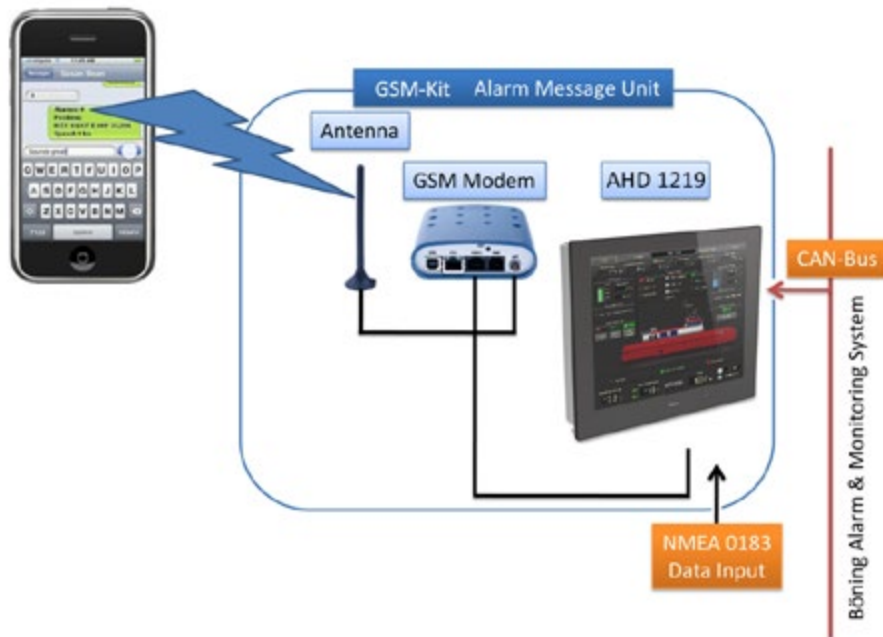


AHD-Charting expands AHD-WNL's functionality with the easily comprehensible graphic presentation of the logged data. AHD-Charting can be downloaded from AHD-WNL's administration pages and the manufacturer's website.

AHD-Charting is suitable for PCs and laptops with Microsoft Windows XP® or later. Apart from an Ethernet cable, no other hardware is required. The logged data are available in AHD-Charting after completing the software's simple installation procedure and establishing the connection to AHD-WNL. No additional configuration is required for AHD-WNL or the vessel's Böning system.

In the graphic presentation, the user can view individual values, move the displayed curve, enlarge value ranges by zooming, and export their data in Microsoft-Excel®'s xls-format.

For Windows® PCs with Windows XP® SP3 and newer.



GSM-Kit

Alarm and Messaging Unit

The GSM-Kit (Alarm Messenger Unit) is an additional alert system with quad band GSM modem and suitable mobile telephone antenna. During an alarm, the system sends a message to a previously entered telephone number (e. g. the owner's or captain's cell phone) with detailed alarm information.

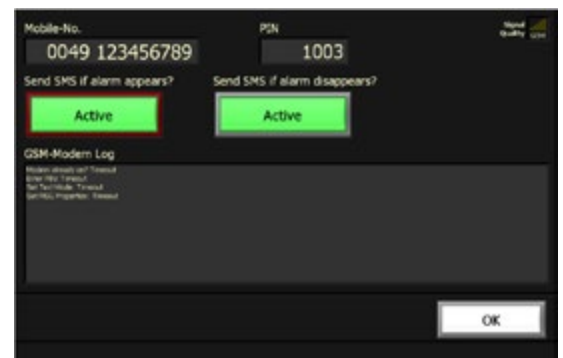
It is connected to a monitor with integrated PC (such as AHD 1219) in the Böning alarm system via a serial cable.

The message is sent via short messaging service (SMS). All commercially available cell phones are supported. A special app for the cell phone is not necessary.

Before using the system, the user only needs to enter the receiving party's telephone number and the SIM card's PIN and then activate the system.

This ensures a maximum degree of on-board safety when the ship is anchored in the harbor or only watch keepers are on board (GSM reception required).

A SIM card is not included and must be provided by the customer.





AHD-SW I

item-no. 10873

Spill Warning Gauge

Warning device for acoustic and optical alerting impending fuel spills during fueling. AHD-SW is an active contribution to environmental protection. Fuel tank spills are avoided by a clearly audible warning signal.

Continuous fuel level display in conjunction with Böning ship alarm systems AHD-SAS 15.

AHD-SW I for monitoring a single tank:

- + Integrated button for switching off the acoustic signal
- + Luminosity automatically adjusted to ambient brightness
- + Several warning gauges per tank can be combined
- + Weather resistant, robust design for outdoor use

Alternate version for 2 tanks (stb and bb) available:

■ AHD-SW II (item-no. 10874)

Inputs	1 x optocoupler input (Alarm acknowledgment)
Outputs	1 x relay output (Horn)
Interfaces	3 x optocoupler input (serial data AHD-SAS 15)
Power supply	24 V DC (+30% / -25%)
Current consumption	20 mA
Dimensions (Ø x T)	100 mm x 39 mm
Degree of Protection	IP 67 (front) IP 31 (rear)
Weight	approx. 0.4 kg
Operation temperature	-25 °C ... +65 °C
Storage temperature	-50 °C ... +85 °C



AHD-S 201

item-no. on request

Hydrostatic Level Transmitter

The Hydrostatic Level Transmitter AHD-S 201 was developed for capturing fuel levels in service and product storage tanks and based on its Germanic Lloyd certification, it is predestined for applications in shipbuilding and offshore use. Its operating range encompasses level readings in ballast tanks, tanks with fuel and oils, service and waste water tanks, etc. as well as a vessel's position and draught measurement.

The AHD-S 201's basis is a specifically optimized capacitive-ceramic sensor element which distinguishes itself through its high overload capacity and resistance to chemicals. Its high temperature operating range (up to 125 °C) and use in the areas with potentially explosive atmospheres (optional) allow for the pressure readings for a wide range of fluids under extreme operating conditions.

Standard version:

- + Nominal pressures = 0...40 cm H₂O or 0...200 cm H₂O
- + Precision = 0.25 % FSO (according to IEC 60770)
- + Customer specific versions on request

Outputs	4 ... 20 mA @ Ub=10 ... 32 V DC
Power supply	24 V DC (+30% / -25%)
Current consumption	21 mA
Dimensions (Ø x L)	39.5 mm x 132.5 mm
Degree of Protection	IP 68
Weight	approx. 0.65 kg (without cable)
Operation temperature	-25 °C ... +125 °C -25 °C ... +80 °C (cable)
Storage temperature	-40 °C ... +125 °C -40 °C ... +80 °C (cable)
Approvals	GL



PE 4000 WE

item-no. 12520

Inclination Angle Sensor

By means of inclination sensor PE 4000 WE, the trim or list inclination of a ship can be recorded (one sensor required per axis) in order to allow inclination depending content calculation corrections e. g. tank content measurements. The sensor is delivered in a robust aluminium housing in two versions (with plug connector or cable connection).

- + Further features of the sensor are:
- + Oil-damped single-axis pendulum system
- + Inductive measurement principle
- + Angle max. +/- 45°
- + Angle accuracy < +/- 0.5 %.

Outputs	4 ... 20 mA
Power supply	18 ... 33 V DC
Degree of Protection	IP 65
Weight	approx. 1.0 kg

Further available inclination angle sensor:

AHD-TCS INCL

item-no. 11944

Inclination Angle Sensor for Trim Tabs Control System AHD-TCS

Further availbale: Description and specifications see page 70.



DeviceNet

item-no. on request

CAN Terminal and CAN Bus Accessories

Accessory for CAN bus interconnection of Böning devices.

CAN terminal - CAN Bus Interface Module

It includes a CAN bus connection feedthrough socket over a 6-pin terminal strip (2 x CAN-H / CAN-L / CAN-Shield) and/or DeviceNet connectors (1 x male / 1 x female).

In addition, a switchable terminating resistor is integrated. The module housing is intended for rail mounting.



DeviceNet Drop Cable, cable endings with 5-pole plug connector (plug / socket)

- + Length 0.3 m / 2 m / 10 m / 25 m / 55 m
- + T-piece for DeviceNet modules, cable endings with 5-pole plug connector (plug / socket)
- + Terminating resistor provided with 5-pole plug connector (plug / socket)

Accessory for serial connections (not illustrated)

- Serial data cable, l = 15.0 m, cable endings with 4-pole plug connector Lumberg M12 (socket / socket)
- Length: 15 m / 20 m / 25 m



BIBS – Integrated Bridge System

The BIBS (Böning Integrated Bridge System) serves as the central control and display platform, where all data present in the system are processed and visualized.

For this purpose, 19" AHD 1219 color displays with integrated panel PC (panel computer), controlled by an innovative operating concept, are installed in the bridge console.

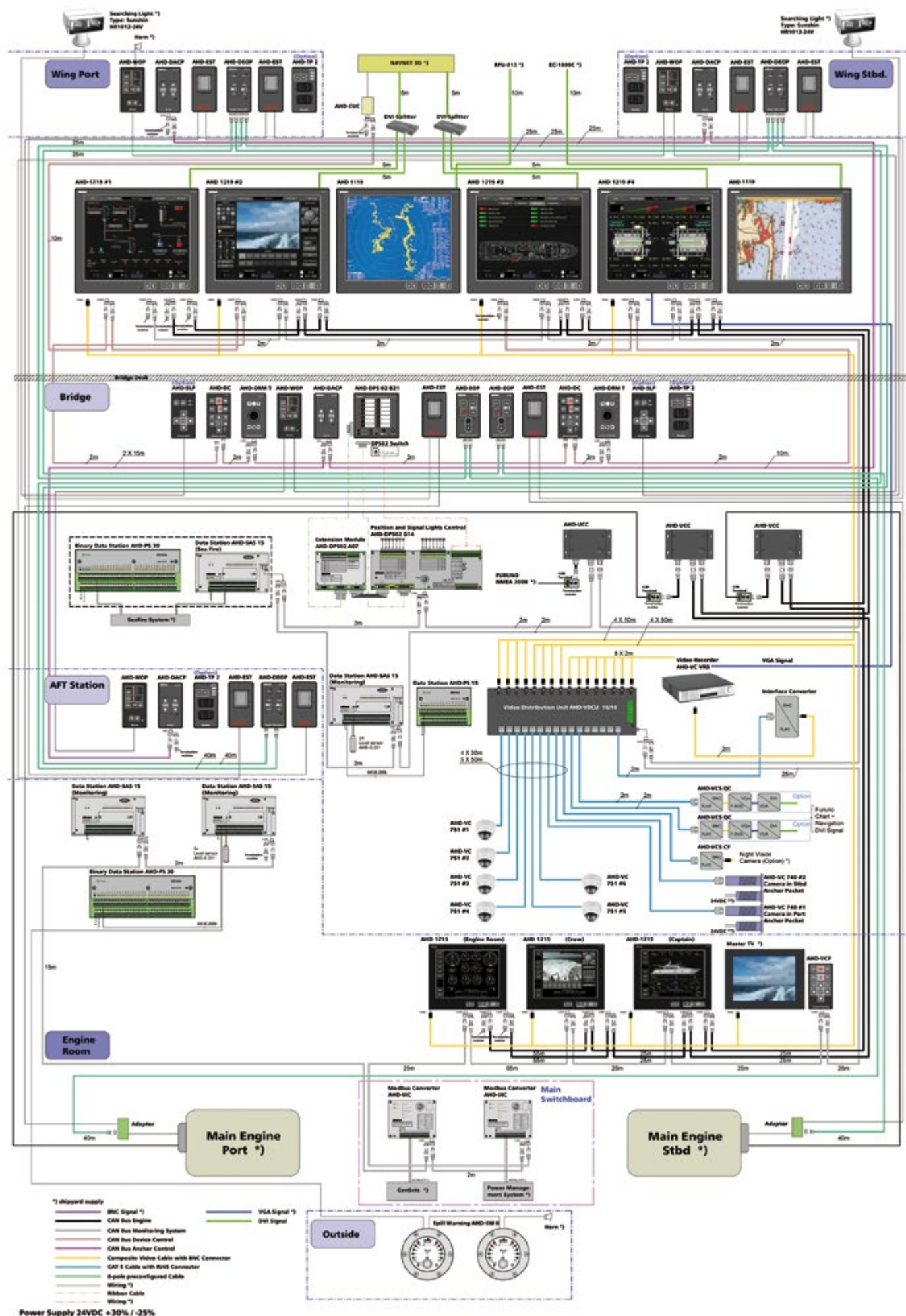
Over a control CAN bus, every AHD 1219 color display (up to 8 displays) can be selected and operated centrally from the Control Unit AHD-DC. Furthermore, each AHD-DC unit is assigned a Control Unit AHD-DRM T, with which the navigation of system menus and the operation of control elements in the graphic visualization can be comfortably executed via trackball. Moreover, these units can also be integrated into e.g. the pilot seat's armrest.

All connected system's data are graphically rendered, integrated into ship graphics and master plans, and visualized individually on the color displays.

To meet the classification societies' equipment regulations, the BIBS Integrated Bridge System is completed with two 19" color monitors AHD 1119. These monitors have been tested and approved for displaying radar and ECDIS sea charts by classification societies and the Federal Maritime and Hydrographic Agency (BSH). One monitor is integrated for each, radar and ECDIS sea charts. It is directly controlled by the respective external system (e. g. Furuno).

The following functions are displayed and controlled:

- + Navigation with sea charts and radar**
(over DVI port with connection to a Furuno control system via CAN/USB Converter AHD-CUC)
- + Data display for backboard and starboard main engines**
(over a separate engine CAN bus for each engine)
- + Connection to the Böning ship alarm system**
- + Tank gauge system**
with continuous tank contents measuring via hydrostatic level transmitters
- + Door monitoring system**
for all relevant doors, hatches, and flaps; in part, with alerting based on the vessel's cruising speed
- + Integration of CCTV camera control**
(video signal via the displays' video input)
- + Display and control of navigation and signal lanterns**
- + Visualization of generator data and power management system**
by external manufacturers
- + Monitoring of circuit breakers**
with remote controlled reactivation
- + Connection to the fire alarm system**
- + Conning page**
with easy to view display of all relevant information as well as depth sounding indicator and presentation of the vessel's roll and pitch movements.
- + Visualization of anchor winch data**
with chain counter and alarm function
- + Control of pumps and valves**





Operation Panels

The increase in on-board automation also leads to an increase in data that must be captured. On the bridge, it is generally visualized by a multitude of different instruments by diverse manufacturers. The captain must constantly adjust to the manifold operating concepts of these instruments.

In our view, harmonizing the vessel's operation, especially on the bridge, is an important task that can contribute to operational safety and comfort. This is why in recent years, we have developed numerous control units with a unified design and under consideration of the latest ergonomic aspects.

All devices feature automatic dimming as well as a unified, glare-free design, allowing for reliable operation when cruising at night.

Our team is happy to advise you on control units, switch panels, panel PCs, or bridge modules.



AHD-WAOP

item-no. 13146

Watch Alarm Panel (BNWAS)

The AHD-WAOP watch alarm panel "Bridge Navigational Watch Alarm System" (BNWAS) meets the requirements of IEC62616-1.

It ensures the bridge crew's watch standby readiness. All watch duty times can be changed after entering a user code. The selected time elapses and has to be acknowledged before running out.

If no acknowledgement is received, the following alarms are raised:

- + First the display of the AHD-WAOP and the mushroom button start blinking,
- + Followed by switching on the internal buzzer as well as relay output "Stage 1"
- + Followed by switching on the relay output "Stage2"
- + Followed by switching on the rely output "Stage 3"

Equipped with a lit mushroom button for easy cyclical activation. Here, intervals of a duration of up to 12 minutes can be set. If the mushroom button is pressed and held for 5 seconds, an emergency alarm is raised.

All system settings such as e. g. time or password can be altered with the system keys and are visualized on the display. Up to 4 acknowledge-authorized end devices can be directly connected for an easy acknowledgement at different locations on the bridge (freely enlargable with multiples). If the external devices are designed accordingly, simultaneous blinking of internal and external buttons is possible.

Inputs	6 x input, potential-free (4 x for ext. acknowledgement, ext. start, ext. stop)
Outputs	4 x relay output (buzzer, alarm, general alarm, error)
Interfaces	1 x RS-485 (connection to VDR)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.25 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 107 mm
Degree of Protection	IP 44 (front) IP 20 (rear)
Weight	approx. 0.4 kg
Operation temperature	-15 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, MCA (MED in preparation)



AHD-WAOP K

item-no. 13224

Watch Keeper Panel (Dead Man System)

Watch keeper panel for ships required to carry such equipment, meets the requirements of a "Bridge Navigational Watch Alarm System" (BNWAS) according to IEC62616-1, and ensures the watch keeper's watch standby readiness.

All watch duty times can be changed after entering a user code. A 3-stage pre-alarm is raised prior to triggering the general alarm. Equipped with a key switch. Removing the key activates the system for the duration of the watch duty. For this, time intervals of up to 30 minutes can be set.

Equipped with integrated display and operating keys for specifying all system settings (such as e.g. time or password), integrated emergency call function, inputs for up to 4 acknowledge-authorized end devices, outputs for horn, pre-alarm, general alarm, and system errors, automatic dimming for all operating and lighting elements.

Technical specifications see AHD-WAOP (above)



AHD-WAOP S

item-no. 14712

Signalling Device

Additional signalling device to the AHD-WAOP for installation on the bridge.

Functions:

- + Reset
- + Emergency call
- + Buzzer
- + Blinking
- + Dim function for glare-free operation.



AHD-WAOP S AP-A

item-no. 15052

Additional Device for Cabins

Additional device to the AHD-WAOP S for installation in messes and cabins. With blinking and signalling function as well as optical and acoustical alarm annunciator.

Available in two versions:

- Installation in consoles
- Wall installation



AHD-WAOP S AP-K

item-no. 14716

Additional Device for Workspace

Additional device to the AHD-WAOP for installation at strategic points in the workspace.

Functions:

- + Reset
- + Optical (blinking) and acoustical (buzzer) alarm

Available in two versions:

- Installation in consoles
- Wall installation

AHD-WAOP S MDA

item-no. 15623

Motion Detector

With automatic reset function in case of motion detection, for installation on the bridge (not approved by all classification societies).



AHD-GAP F

item-no. 14002

General Alarm Unit with Fire Alarm Function

AHD-GAP F is used to control the acoustic and optical ship alarm devices in emergency situations. In addition to manual signal activation, all required signals, such as "Abandon Ship", "General Alarm", and "Fire Alarm" are pre-programmed and can be accessed directly; signal and pause intervals can be preselected in stages; external inputs for triggering general or fire alarm as well as pause control; key lock against unintended activation, secure power supply via main and emergency feed;

Weather proof, robust design, suitable for use on bridges or outdoor use, automatic dimming of the operation and display elements.



AHD-TP 2

item-no. 12879

Operating Panel for Thrusters

The thruster panel AHD-TP 2 allows for comfortable and individual control of two hydraulically and/or VFD (electrically) operated ABT thrusters. Compact structure, designed for installation in helms, panels, switch boards or switch cabinets; water tight design for outdoor use; suitable for use on bridges due to dimming of the indicator lights; integrated monitoring with acoustic signal device;

Single-axis joystick with no-contacting hall operating principle, version as 2-channel control with automatic return in center position; alternatively, available with friction hold function (upon request).

Also available with digital joysticks: AHD-TP 2 D

AHD-GAP F

Inputs	3 x control input for fire alarm, general alarm and signal pause
Outputs	5 x relay output (system error, 4 x signal control)
Power supply	24 V DC (+30% / -25%) 2 inputs
Current consumption	0.1 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 65 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR

AHD-TP 2

Inputs	3 x signal (error feedback)
Outputs	2 x control voltage analog 0.5-5 V, 2 x signal (start, stop)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.1 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 65 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-SLPitem-no. 10691

Searchlight Control

Operating panel for controlling a searchlight in the uniform design of the yacht device series. The functional scope encompasses the searchlight's orientation in any direction. The positional change can be selected in 2 stages. Button for switching the lamp on and off; additional function key for setting the light signals manually; up to 4 control units can be networked in a parallel manner.

Compact module for installation in consoles or switch cabinets; suitable for indoor and outdoor applications; suitable for use on bridges due to automatic dimming of all operation and lighting elements; standard version for controlling our searchlight AHD-SL (Sanshin HR 1012 with 12 V control inputs);

Alternatively, available with 24 V control outputs for controlling other searchlights: AHD-SLP 24 V (item-no. 14769)

AHD-SLP	
Outputs	1 x transistor, short-circuit proof (lamp, vertical tilt, horizontal pan)
Interfaces	1x optocoupler (bus for additional operation units)
Power supply	24 V DC (+30% / -25%) 2 inputs
Current consumption	30 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 66 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 0.15 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-SLitem-no. 10756

Searchlight Type HR 1012, Remote Controllable

Searchlight HR 1012 (Sanshin) for illumination during nighttime maneuvering operations or as signal devices; equipped with two powerful halogen lamps (55 W each, with reflector inserts) and remote controllable pan and tilt function; 360° horizontal lamp positioning (endless rotation) and 26°; max. reach 500 m at a luminosity of 160,000 cd;

Version in seawater resistant aluminum die-cast housing; protection class IP 56 (front) for indoor and outdoor use

AHD-SL	
Inputs	3 x control input (lamp, vertical tilt, horizontal pan)
Current consumption	5 A @ 24 V DC
Dimensions (W x H x D)	230 mm x 200 mm x 210 mm
Degree of Protection	IP 56
Weight	approx. 3.25 kg
Operation temperature	-10 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C

**AHD-WOP**

item-no. 11331

Whistle Operation Panel

Control of one or several signal horns on board of ships; sound signals issued in accordance with the collision prevention regulations "Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGs)," including supplements. Pre-programmed signals for maneuvering and during diminished visibility can be activated directly via keys; function for collision warning and manual signaling; interval times can be set; additional connection for signal lamps; up to 4 control units can be networked in a parallel manner

Version for installation in consoles or switch cabinets; suitable for indoor and outdoor use; suitable for use on bridges due to automatic dimming of all operating and lighting elements;

**AHD-DACP**

item-no. 12671

Control Panel for Windlasses

Anchor control panel for operation of 2 windlasses in Böning's yacht design, comfortable up and down control; direct control via frontside integrated function keys, operational readiness display; up to 4 control units can be networked in a parallel manner

Version for control of 2 windlasses; suitable for installation in consoles or switch cabinets; for indoor and outdoor use; suitable for use on bridges due to automatic dimming of all operation and lighting elements

Alternatively, available for control of a single windlass: AHD-ACP (item-no. 12631)

AHD-WOP

Outputs	4 x relay output (2 x horn, 2 x light signal)
Interfaces	1 x RS-485 (bus for additional operation units)
Power supply	24 V DC (+30% / -25%)
Current consumption	max. 400 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 65 mm
Degree of Protection	IP 66 (front) IP 20 (rear)
Weight	approx. 0.4 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	Approval in preparation

AHD-DACP

Outputs	4 x relay output (2 x anchor up/down each)
Interfaces	CAN bus (Böning bus)
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 65 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



Engine Start/Stop Systems

With the engine operation panel AHD-EOP, maritime diesel engines can be started and stopped conveniently and safely. Instead of conventional ignition locks and the associated high cabling effort, AHD-EOP uses modern transponder technology, which contributes to increased operational safety and also simplifies cabling. The backboard and starboard engines are activated and enabled for starting by inserting the transponder key into the respective socket.

The dual engine operation panel AHD-DEOP is used for starting and stopping two maritime propulsion engines with comfort and ease. The device can be installed in a separate location and works in combination with the matching key units AHD-EOP.

While the transponder key remains inserted, the engine is operational and can be started with any AHD-EOP or AHD-DEOP unit in the system. This is signaled by an LED on all units.

The engine is started by pressing the start button (AHD-EOP or AHD-DEOP). The stop button, in turn, stops the engine.

If the key is removed from the unit, the engine is stopped immediately. All AHD-DEOP units can be cascaded, resulting in easier installation of additional units.

**AHD-EOP**

item-no. 12030

Engine Operation Panel for One Ship Main Engine, Basic Module

Engine operation panel for convenient and safe starting and stopping of one ship main engine. Release for engine operation occurs via innovative transponder technology, providing an increased degree of protection against unauthorized operation; lit push buttons for ignition, start and stop; integrated emergency stop function and LED battery charge indicator; lit keyhole; connection with M12 plug connection via EOP adapter module (item no. 11823 or variants), can be cascaded for several helms via separate input and output;

Compact design for installation in consoles, control cabinets, and control panels; suitable for indoor and outdoor applications; suitable for use on bridges due to automatic dimming of all operation and light elements; version with release for engine operation via pluggable transponder key (not included in the scope of delivery); on request, individual encoding can be transferred to several transponder keys.

AHD-EOP

Combined inputs / outputs	2 x M12 plug connector (1 x input, 1 x output)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.4 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 66 mm
Degree of Protection	IP 66 (front) IP 65 (rear)
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +65 °C
Storage temperature	-50 °C ... +85 °C

**AHD-DEOP**

item-no. 11479

Dual Engine Operation Panel for Ship Main Engines, Expansion Module for AHD-EOP

Dual engine operation panel for safe starting and stopping of two ship main engines, expansion module for transponder-controlled system AHD-EOP; lit push buttons for ignition, start, and stop; integrated emergency stop function and LED battery charge indicator; connects via M12 plug connections, can be cascaded for several helms; via 2 separate inputs and outputs each;

Compact design for installation in consoles and control panels; suitable for indoor and outdoor applications; suitable for use on bridges due to automatic dimming of all operation and light elements; version without release for engine start (this occurs externally via AHD-EOP or AHD-DEOP K).

AHD-DEOP

Combined inputs / outputs	4 x M12 plug connector (2 x input, 2 x output)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.4 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 65 mm
Degree of Protection	IP 66 (front) IP 65 (rear)
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +65 °C
Storage temperature	-50 °C ... +85 °C



AHD-EOP K I

item-no. 12214

Pair of Keys for AHD-EOP, Stainless Steel Version

Transponder keys for releasing and operating one ship main engine via operation panel AHD-EOP.

- + Patented design with paired keys, which can be kept together with integrated magnets
- + Individual encoding with AHD-EOP master key, can be transferred to other key sets
- + Version in stainless steel design housing (K I) with “Böning” logo

Also available in buoyant plastic housing

- **AHD-EOP K II** (item-no. 12215)

Other versions with customer specific logos available on request

AHD-EOP K I

Dimensions (W x H x D)	60 mm x 40 mm x 18 mm
Degree of Protection	IP 67
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-EOP Adapter

item-no. 11823

Transfer Unit for AHD-EOP

Transfer unit for simple adaptation of our control panel AHD-EOP to the ship engine.

- + Module with relay control outputs and terminal clamps
- + Universal version for installation onto norm carrier rail in control stands, consoles, or switch boxes
- + Incl. M12 plug connector (EOP port) and pluggable terminal strip

Special versions with individual adjustment of the control signals to the respective engine type for:

- **MAN Vneu** (item-no. 11823)
- **MAN EDC** (item-no. 12366)
- **CAT** (item-no. 12368)

AHD-EOP Adapter

Combined inputs / outputs	1 x M12 plug connector (1 x input)
Dimensions (W x H x D)	46 mm x 78 mm x 33 mm
Degree of Protection	IP 10
Weight	approx. 0.1 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-EOP EM

item-no. 15496

Optional Emergency Operation Unit for AHD-EOP / AHD-DEOP

The additional safety device allows starting and stopping the engine parallel to the regular helms, if e. g. the transponder keys are missing. Furthermore, it can also be used, if e. g. an unintentional start of the engines must be prevented due to maintenance work.

Key switch positions:

- + **LOCAL** (Operation only possible from emergency unit, other operation units blocked)
- + **REMOTE** (Operation from AHD-EOP / AHD-DEOP)

The engine can only be started and stopped from this operation panel, if the key is in the LOCAL position. In this key position, the operation panels AHD-EOP/AHD-DEOP are deactivated.

In the REMOTE position, the engines can only be started and stopped from the operation panels AHD-EOP/AHD-DEOP.

Also available for MAN, CAT and MTU engines.

AHD-EOP EM

Combined inputs / outputs	2 x M12 plug connector (1 x input, 1 x output)
Power supply	24 V DC (+30% / -25%)
Current consumption	50 mA @ 24 V DC
Dimensions (W x H x D)	219.6 mm x 130 mm x 79.7 mm
Degree of Protection	IP 65
Weight	approx. 1.4 kg
Operation temperature	-25 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-EST

item-no. 14359

Emergency Stop Control Unit

Emergency stop control unit in Böning's design for stopping diesel engines.

- + Secured against unintentional triggering by cover flap
- + Locking push button with integrated LED lighting
- + Module can be cascaded, wire break monitoring according to class possible
- + Version with pluggable terminal strips
- + Suitable for installation in consoles or switch panels

AHD-ORP

item-no. 14220

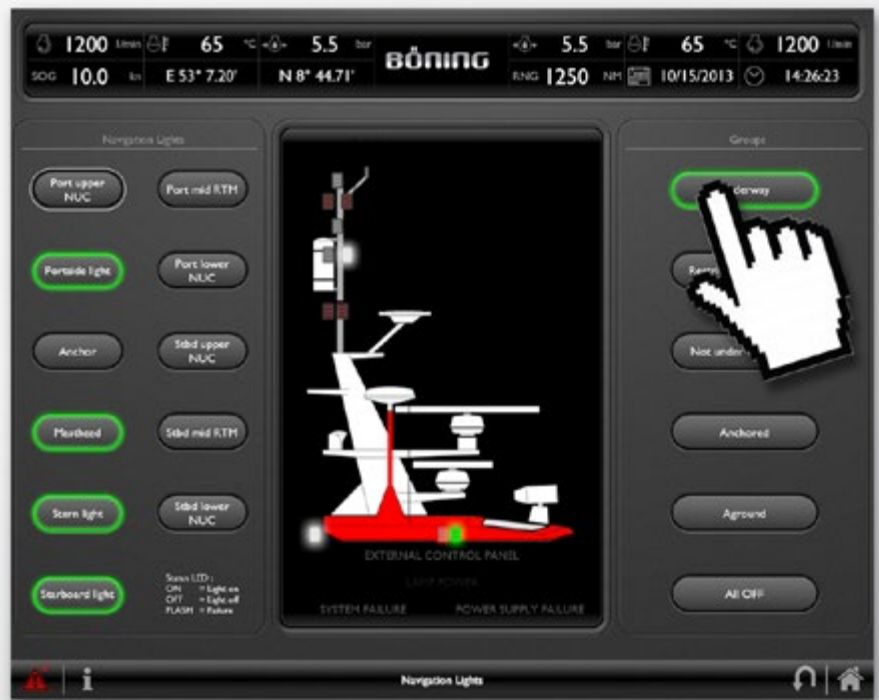
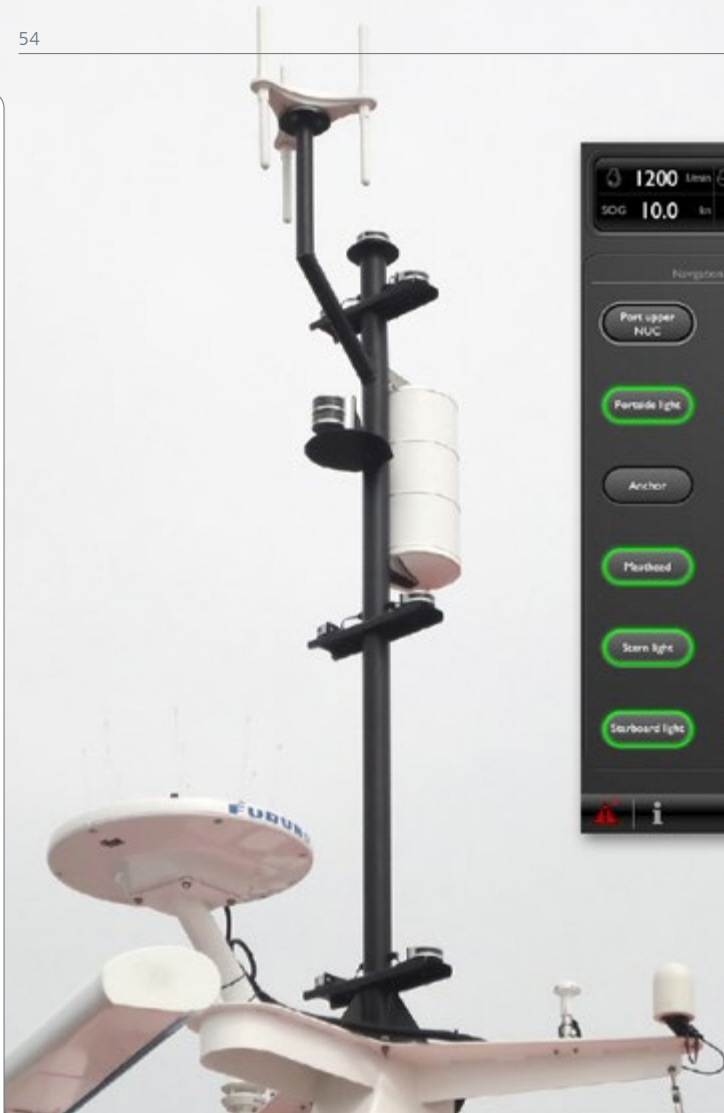
Override-Panel

Override panel in Böning's design for activating the override operation for diesel engines.

Technically identical to AHD-EST (item-no. 14359)

AHD-EST/AHD-ORP

Inputs	1 x emergency stop input
Outputs	1 x emergency stop output
Power supply	24 V DC (+30% / -25%)
Current consumption	70 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 70 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.25 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



Monitoring and Control Systems for Navigation Lanterns

The modular AHD-DPS 02 controls and monitors up to 42 navigation and signal lanterns on board vessels. Due to its modular structure, the system can be matched to customer specific requirements. It is comprised of one basic module and up to 4 extension modules as well as a customer specific operation panel. The system is available in different versions for all customary voltages on board vessels, and it can be used with conventional or LED lanterns.

The minimum configuration encompasses a basic module for 14 lanterns and a standard operation panel. By using additional basic modules, any number of lanterns can be controlled and monitored.

The lanterns are controlled with an operation panel, which provides one operation button and one LED status light for each lamp circuit. Depending on the requirements, the operation panels can be delivered in their standard size or according to the customer's wishes. Additional operation options for touch screen or panel PC are also available.

The lamp current is provided either by the main feed or a second, separate feed (emergency feed). If one of these power feeds fails, it can be manually switched over to the other. Both currents are continuously monitored.

The internal electronics are automatically supplied by one of the available power sources. If one lamp channel is switched off, both switch contacts are disconnected from the power supply with a relay. The lamp outputs are short-circuit proof and maintenance free. The lanterns can be controlled manually during electronics failure.

A collective alarm (closed) contact reports current error conditions to a higher ranking alarm system.

The CAN bus or Modbus enables connection to ancillary systems for convenient control and visualization.



AHD-DPS 02 G14

item-no. 13828

14 Channel Basic Module for Navigation and Signal Lights Control (24 V Bulb)

The basic module for controlling and monitoring navigation and signal lamps has been constructed for 14 lamp circuits, which can be controlled and monitored independently; lamp failures, short-circuits, or wire breaks are alerted; in addition, operating time monitoring and end-of-life warning ($t < 2000$ h) can be parametered for each lamp circuit. The system includes a dual power supply, which switches over to the emergency feed in case of main feed failure. Both feeds are also monitored.

Additional features:

- + Direct switching of the lamps is possible even in case of electronics failure
- + All switch channels are short-circuit proof, automatic reset fuses enable maintenance and exchange-free operation
- + The system can be expanded to up to 42 lamp circuits with the extension modules AHD-DPS 02 A07
- + Optional communication modules AHD-DPS 02 GC (RS-422, RS-485, CAN) available on request

Electronics unit for 24 V incandescent lamps (bulbs) in carrier rail housing, suitable for carrier rail mounting (TS32/35).

Alternate versions for:

- **24 V LED lamps** (item-no. 13831)
- **230 V incandescent bulbs** (item-no. 14678)
- **230 V LED lamps** (item-no. 14679)
- **115 V incandescent bulbs** (item-no. 13830)
- **115 V LED lamps** (item-no. 15113)

AHD-DPS 02 G14

Inputs	1 x optocoupler input (Alarm acknowledgment)
Outputs	14 x relay output (2 poles, for lamps) 3 x relay contact status signals (Common alarm, supply error, lamp error)
Combined inputs / outputs	1 x connection for operation unit (ribbon cable), 1 x connection for max. 4 extension modules (ribbon cable)
Interfaces	1 x CAN (galvanically isolated), optional communication module AHD-DPS 02 GC for RS-232, RS-485 or CAN
Power supply	24 V DC (+30% / -25%)
Current consumption	420 mA @ 24 V DC
Dimensions (W x H x D)	324 mm x 126 mm x 76 mm
Degree of Protection	IP 20
Weight	approx. 1.05 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, RMRS, CRS, BV



AHD-DPS 02 B14

item-no. 11414

Operating Panel for Navigation and Signal Light Control

Operating panel for navigation and signal lamp monitoring AHD-DPS 02 G14 for controlling 14 lamp circuits.

- + Compact design for installation in consoles, panels, and switch control boxes
- + Individual ON/OFF operating keys for 14 navigation and signal lamps
- + Integrated signal LEDs for displaying lamp status, lamp fault, supply fault, and system failure
- + Additional warning indicator for the lamps' rest-of-life (2,000 hours remaining)



AHD-DPS 02 BS

item-no. 10945

Customer Specific Operation Panel

For controlling our navigation and signal lamp monitoring system AHD-DPS 02 G14.

Identical technical qualities and options as standard operating panel (see AHD-DPS 02 B14, item-no. 11414 or variant). Lamp control elements and labels are arranged individually, according to tabular or graphic templates.

- + All signal LEDs are automatically dimmed
- + Integrated alarm buzzer and acknowledge key with lamp test function
- + Optional switch for releasing an existing remote control (via Basic Module AHD-DPS 02 G14's CAN port)

Device for console installation or flush mounting.

Alternate versions:

- **AHD-DPS 02 B21** with 21 channels (item-no. 11481)
- **AHD-DPS 02 B28** with 28 channels (item-no. 12521)
- **AHD-DPS 02 B35** with 35 channels (item-no. 12522)
- **AHD-DPS 02 B42** with 42 channels (item-no. 12382)

AHD-DPS 02 B14

Combined inputs / outputs	1 x connection to basic module (ribbon cable)
Power supply	24 V DC (+30% / -25%)
Current consumption	400 mA @ 24 V DC
Dimensions (W x H x D)	144 mm x 144 mm x 64 mm
Degree of Protection	IP 22 (front side with protection cover IP 54)
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, RMRS, CRS, BV

Depending on the application and number of lamp channels to be controlled, various sizes are available.

Device for installation in consoles or switch boards.

Alternate versions:

- AHD-DPS 02 BS
with front frame 192 mm x 144 mm
(item-no. 11060)
- AHD-DPS 02 BS
with front frame 288 mm x 144 mm
(item-no. 11061)

AHD-DPS 02 BS

Outputs	1 x connection to basic module, up to 4 connections to extension modules
Power supply	24 V DC (+30% / -25%)
Current consumption	400/600/800 mA @ 24 V DC
Dimensions (W x H x D)	144/192/288 mm x 144 mm x 64 mm
Degree of Protection	IP 22 (front side with protection cover IP 54)
Weight	approx. 0.5 kg / 0.7 kg / 0.9 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, RMRS, CRS, BV



AHD-DPS 02 Selector Switch item-no. 8794

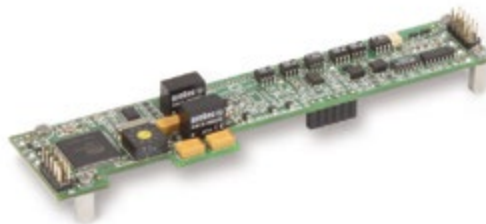
Selector Switch for Navigation and Signal Light Control System

Installation toggle switch for switching the supply voltage of a control and monitoring system for navigation and signal lamps. With this device, the lamp circuits are generally supplied and a changeover between the main and emergency feed is established. It can be connected directly via basic module AHD-DPS 02 G14.

3 switching levels:

(0 = off, 1 = main feed, 2 = emergency feed).

Inputs	Main supply / Emergency supply
Outputs	Lamp supply
Dimensions (W x H x D)	48 mm x 48 mm x 95 mm
Degree of Protection	IP 65 (front)
Weight	approx. 0.1 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-DPS 02 GC item-no. 12258

Communication Module

Electronics card for extending the basic module with additional interfaces; with this, the existing lamp circuits can be integrated into any external system. For ModBus RTU, for insertion onto the circuit board of basic module.

Alternate versions:

- AHS-DPS 02 GC with **combined RS-485/CAN interface** (item-no. 12256)
- AHD-DPS 02 GC with **4-pin RS-422 interface** (item-no. 11231)

Inputs	Internal connection with basic module
Outputs	Over terminal 42...46 (basic module)
Interfaces	a) 1 x CAN and 1 x RS-485, b) 1 x RS-422, c) 2 x RS-485 (Modbus RTU protocol)
Power supply	24 V DC (+30% / -25%)
Current consumption	20 mA @ 24 V DC
Dimensions (W x H x D)	90 mm x 20 mm x 20 mm
Weight	approx. 0.02 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-DPS 02 A07

item-no. 12337

**7 Channel Extension
Module (24 V bulb)**

Extension module for 7 lamp circuits to expand an existing basic module for monitoring and controlling navigation and signal lamps. The extension module includes 7 channels. The technical qualities and options are identical to those of the basic module (see AHD-DPS 02 G14, item no. 13828 or variant). Every system can be expanded with up to 4 extension modules to a maximum of 42 lamp circuits.

Electronics unit for 24 V incandescent lamps (bulbs) in carrier rail housing, suitable for carrier rail mounting (TS32/35).

Alternate versions for:

- **24 V LED lamps** (item-no. 12157)
- **230 V incandescent bulbs** (item-no. 14674)
- **230 V LED lamps** (item-no. 14675)
- **115 V incandescent bulbs** (item-no. 11338)
- **115 V LED lamps** (item-no. 15114).

Outputs	7 x relay output (2 poles, for lamps)
Combined inputs / outputs	1 x connection for operation unit (ribbon cable), 1 x connection for max. 3 extension modules (ribbon cable)
Power supply	24 V DC (+30% / -25%)
Current consumption	380 mA @ 24 V DC
Dimensions (W x H x D)	148 mm x 126 mm x 66 mm
Degree of Protection	IP 20
Weight	approx. 0.45 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, RMRS, CRS, BV



AHD-POS 10

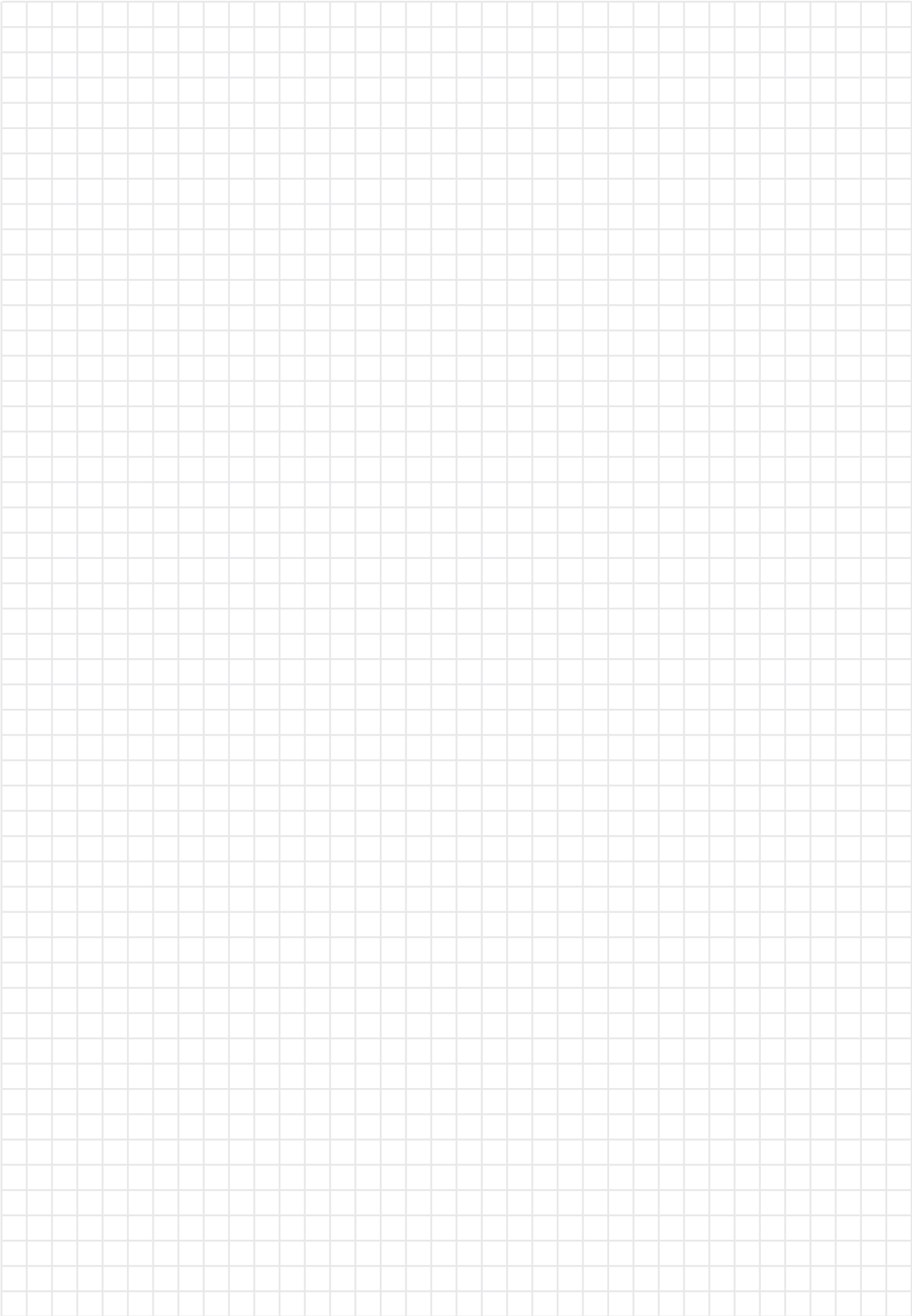
item-no. 10019

**Navigation Light Monitoring
System for 10 Lamp Circuits**

Device for monitoring the states of 10 navigation lamps on board a vessel.

- ✚ Mounted onto base plate for wall mounting in consoles, switch panels, or switch boxes
- ✚ Input and output terminals for connecting up to 10 lamp circuits
- ✚ Connected in the lamp circuit between the on/off switch and the lamp.
- ✚ Lamp monitoring system with alarm function during lamp failure
- ✚ Data transfer of status and alarm messages to the ship alarm system via CAN bus, including alarm acknowledgement
- ✚ LED indicator for power supply and power failure

Outputs	1 x relay contact for common alarm
Combined inputs / outputs	10 lamp circuits with 1 x input and 1 x output each (max. 40W)
Power supply	24 V DC (+30% / -25%)
Current consumption	150 mA @ 24 V DC
Dimensions (W x H x D)	215 mm x 120 mm x 55 mm
Degree of Protection	IP 10
Weight	approx. 0.6 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C





CCTV Video Monitoring System

Video monitoring (CCTV = Closed Circuit Television) has become a standard for increased safety and comfort on board ships, e. g. by monitoring public and private areas, unmanned engine rooms, gangways, accesses, visual support of docking and undocking maneuvers, as well as other areas.

The Video Monitoring System AHD-VCS was developed for operating up to 16 video cameras separately, including pan/tilt and zoom control. Here, the system components can easily be integrated into a Böning ship alarm system, because the same displays are used. Even the data communication runs on the same CAN bus. There is no need for special, separately installed camera monitors. An unlimited number of control units can be connected.

The system's main components are: Video Distribution Control Unit AHD-VDCU (for 4, 8, or 16 cameras), Video Control Panel AHD-VCP, and the touch screen color displays AHD 1215/AHD 1219 or AHD 880 with individual, separate control units. The Video Distribution Control Unit AHD-VDCU processes and controls the camera signals and forwards their video signals to the connected displays.

You can choose from various models for standard and special applications. The robust cameras meet the requirements of a maritime environment and are protected against vandalism. As a rule, they are controlled and powered by the Video Distribution and Control Unit AHD-VDCU. Models with a higher current consumption or nonstandard power supply are powered by a separate source.

The video monitoring system can be expanded with an optional Video Quad Processor AHD-VCS Q 4-1, by which four selected cameras can be viewed on a single screen. Another available option is the Digital Video Data Recorder AHD-VC VR8 with 8 loop through inputs, 320 GB internal hard disk (data compression MPEG-4), DVD-R/W, and several other functions.



AHD-VDCU 16/16

item-no. 11605

16 x 16 Video Distribution Control Unit

Central Unit with 16 x Video-In and 16 x Video-Out

Video distribution control unit for the distribution and control of video signals received from video systems (video cameras.) The video signals may be transferred to displays, television sets, video data recorders and other video processing systems. AHD-VDCU 16/16 operates autonomously or integrated into an installed ship alarm system.

The unit is operated via CAN bus or RS-485 with a separate video control unit or control elements on the connected color displays' visualization pages.

Version for bulkhead mounting.

Other versions:

- **AHD-VDCU 8/8**
8 x Video-In and 8 x Video-Out
(item-no. 11417)
- **AHD-VDCU 4/4**
4 x Video-In and 4 x Video-Out
(item-no. 11758)

AHD-VDCU 4/4

Inputs	4 camera inputs with RJ45 sockets for connection of video cameras with one standard CAT5 network cable for transmission of video signals, camera control signals and 12 V DC camera power supply
Outputs	4 video outputs (BNC connectors) for 75 Ohms coaxial cable (RG-59) (transmission of video signals, 1 Vpp, 75 Ohms)
Interfaces	1 x CAN, 1 x RS-485
Power supply	24 V DC (+30% / -25%)
Current consumption	0.36 A @ 24 V DC (plus max. 400 mA/camera when supplied via camera input)
Dimensions (W x H x D)	330 mm x 160 mm x 42 mm
Degree of Protection	IP 20
Weight	approx. 1.2 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-VCS Q4-1

item-no. 11824

Video Quad-Screen Processor Unit (Quadrant Divider)

Video quad-processor in surface mountable housing for integration into consoles or switch panels. 4-channel color quadrant divider for mixing 4 video input signals in a single video output signal with quad-screen presentation.

- ✚ Preset for use in a video system with video standard PAL 1024 x 624 pixels
- ✚ 4 loop-through channels (1 Vpp, 75 Ohm), each with BNC connection for video input and output
- ✚ 1 live-image monitor (1 Vpp, 75 Ohm) with BNC connection for quad, full screen, and auto sequence presentation output.

AHD-VCS Q4-1

Inputs	4 loop through channels on input side (1 Vpp, 75 Ohm), 1 VCR IN video input (1 Vpp, 75 Ohm), 4 alarm inputs (NO/NC contact, selectable)
Outputs	4 loop through channels on output side (1 Vpp, 75 Ohm), 1 VCR OUT video output (1 Vpp, 75 Ohm), 1 Live image monitor output (1 Vpp, 75 Ohm), 1 relay output (NO/NC contact)
Interfaces	1 x RS-232
Power supply	12 V DC (+30% / -25%) or 24 V DC over AHD-VSC QC, resp. (see page 66)
Current consumption	max. 0.85 A @ 12 V DC
Dimensions (W x H x D)	216 mm x 45 mm x 214 mm
Degree of Protection	IP 20
Weight	approx. 2.5 kg
Operation temperature	0 °C ... +50 °C
Storage temperature	-10 °C ... +85 °C



AHD-VCP

item-no. 11332

Video Control Panel

The video control panel AHD-VCP is used for selecting and controlling the video cameras connected to the video monitoring system.

The unit is connected to the CAN bus, communicating with the video distribution control Unit AHD-VDCU.

All available function for controlling the camera can easily and comfortably selected by keystrokes.

Interfaces	1 x CAN
Power supply	24 V DC (+30% / -25%)
Current consumption	40 mA @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 46 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.3 kg
Operation temperature	-30 °C ... +55 °C
Storage temperature	-50 °C ... +85 °C



AHD-VC VR8/16

item-no. 13472

Video Recorder

The digital video data recorder AHD-VC VR8 is used for data storage of video signals from connected cameras or other video signal sources.

The device is notable for its ease of use and convenient range of features.

- + Simultaneous processing of up to 8 video channels
- + Video standards: SVGA; PAL/NTSC
- + Auto recognition or menu selectable

Hard drives:
2 SATA solid hard drives, max. 2 TB, Compression: H.264

Inputs	Composite Video 1 Vss, 75 Ohm, automatic termination; PAL/NTSC, Automatic recognition Video: 8/16 BNC (loop through), automatic termination Audio: 4 RCA (Cinch)
Outputs	Monitor A – VGA RGB Monitor B – VGA RGB Audio: 2 RCA
Interfaces	1 x CAN Ethernet: RJ45, 10/100/1000BaseT according to IEEE802.3 Monitors: VGA D-Sub (2) USB 2.0: at front and rear side for mouse and USB storage devices
Power supply	100...240 V AC 50/60 Hz
Current consumption	max. 1.8 A
Dimensions (W x H x D)	355 mm x 88 mm x 362 mm
Degree of Protection	IP 20
Weight	approx. 4.3 kg
Operation temperature	0 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C

**AHD-VC 753**

item-no. 14554

Motor Dome Color Camera, Pan/Tilt Function, Remote Controlled

The motor dome camera AHD-VC 753 is a high-resolution color camera with remote controlled pan, tilt, zoom, and focus function.

- + 1/4" Sony Super HAD CCD, 752 x 582 pixels (PAL)
- + 10 x optical zoom with 10x digital zoom
- + High resolution (color: 520 TV lines; B/W: 570 TV lines)
- + Intelligent pan/tilt control
- + 360° endless rotation; 0° ... 180° tilt (auto flip mode)
- + 0.05°/sec. ... 360°/sec. pan/tilt speed
- + Vector drive technology; switchable day/night function (ICR blocking filter)
- + Can be remote controlled via control units or touch screen
- + OSD menu (7 languages)
- + Numerous monitoring functions: privacy masking; password protected; elegant, vandalism proof aluminum housing with PC dome hood for ceiling mounting

Power supply	12 V DC
Current consumption	0.67 A (1 A with internal heating)
Dimensions (Ø x H)	165 mm x 162 mm
Degree of Protection	IP 66
Weight	approx. 1.85 kg
Operation temperature	-10 °C ... +50 °C
Storage temperature	-10 °C ... +60 °C

**AHD-VC 731**

item-no. 13696

FlexiDome Color Camera, Pan/Tilt Function, Manual

The FlexiDome camera AHD-VC 731 is a high-resolution color camera, manual pan/tilt function and variofocus lens.

- + 1/3" Interline Transfer CCD, 752 x 582 pixels (PAL)
- + High resolution (color: 540 TV lines; B/W: 570 TV lines)
- + 360° endless rotation; 0° ... 90° tilt, +/-90° azimuth
- + Variofocus lens F1/2.6/2.6-6.0 mm (47° - 95° h)
- + Light sensitivity < 0.7 lux with NightScene function for increased sensitivity
- + Elegant, vandalism proof aluminum die-cast housing with PC dome hood for ceiling installation.

Power supply	10.8 - 39 V DC / 12 ... 28 V AC, 45 ... 65 Hz
Current consumption	0.17 A (0.25 A with internal heating)
Dimensions (Ø x H)	158 mm x 85 mm
Degree of Protection	IP 66
Weight	approx. 0.74 kg
Operation temperature	-20 °C ... +45 °C
Storage temperature	-40 °C ... +70 °C



AHD-VC 720IR

item-no. 12263

Infrared Dome Color Camera, Pan/Tilt Function, Manual

Infrared dome color camera, manual pan/tilt function. The infrared dome color camera AHD-VC 720 is a high-resolution camera for still image monitoring.

- + 1/3" Sony Super HAD CCD,
- + Manually controlled variozoom lens 4.0-9.0 mm, DC,
- + Min. light sensitivity 0.5/0.004 lux,
- + Manually controlled 360° rotation,
- + Manually controlled tilt 10° ... 90°,
- + IR-LED reflector with a range of up to 15 m

Power supply	12 V DC
Current consumption	0,5 A
Dimensions (Ø x H)	120 mm x 96 mm
Degree of Protection	IP 66
Weight	approx. 1.85 kg
Operation temperature	-10 °C ... +50 °C
Storage temperature	-10 °C ... +60 °C



AHD-VC 711

item-no. 13744

Bullet Miniature Color Camera, Pan/Tilt Function, Manual

Bullet miniature color camera, manual pan/tilt function. The bullet miniature color camera AHD-VC 711 is a high-resolution camera for monitoring still images.

- + Vandalism proof aluminum die-cast housing.
- + Adjustable socket for surface mounting
- + 1/3" CCD sensor
- + Resolution: color 700 TV lines
- + Light sensitivity < 0.1 lux
- + Lens 3.6 mm (69° h)
- + Integrated preconfigured connection cable

Power supply	12 V DC
Current consumption	83 mA
Dimensions (Ø x H)	approx. 23 mm x 91 mm
Degree of Protection	IP 67
Weight	approx. 0.07 kg
Operation temperature	-10 °C ... +50 °C
Storage temperature	-10 °C ... +60 °C

**AHD-VC 740**

item-no. 12969

Anchor Pocket Camera with LED Spot Light

Color camera and additional LED spot light, each in a submersible special installation casing for installation in the anchor pocket.

Camera:

- + 1/3" Sony CCD chip, 752 x 582 pixels (PAL)
- + High resolution (color: 540 TV lines)
- + Lens 4.0 – 9.0 mm; manually operated zoom
- + Light sensitivity 0.1/0.0 lux

LED spot light:

- + 7 single-LED 110 lumens
- + 30000 hrs. operating life
- + 7000 K color temperature, 3500 lumen light output
- + Aluminum bronze and 770 aluminum casing
- + Glass lens borosilicate glass

Power supply	12 V DC
Current consumption	300 mA (camera), 1.6 A (LED spotlight)
Dimensions (Ø x H)	82 mm x 325 mm camera 82 mm x 138.5 mm LED spotlight
Degree of Protection	IP 68 (front) IP 44 (rear) / 10 bar housing
Weight	approx. 1.5 kg camera approx. 1 kg LED spotlight
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C

**AHD-VC 741**

item-no. 13768

Bulbous Bow/Dolphin Camera

Plettac color camera FAC 940L, in a submersible, special installation casing for bulbous bow installation (installation kit item-no. 13390).

- + 1/2" Interline Hyper HAD CCD chip
- + 752 x 582 pixels (PAL)
- + High resolution (color: 580 TV lines hor. CVBS)
- + Lens F1.4/4.5 mm, (79° h), SCS
- + Light sensitivity < 0.05 lux
- + Bronze aluminum and 5083 aluminum casing
- + Glass lens borosilicate glass

Power supply	10 V DC ... 29 V DC
Current consumption	50 mA @ 12 V DC
Dimensions (Ø x H)	70 mm x 61.5 mm camera 130 mm x 222 mm housing
Degree of Protection	IP 68 (front) IP 44 (rear) / 10 bar housing
Weight	approx. 3 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C



AHD-VSC C item-no. 11720

Video Signal Converter
for AHD-VC Cameras with
Terminal Clamp Connections

The video signal converter AHD-VSC C is used for connecting standard AHD-VSC cameras to the video distribution control unit AHD-VDCU with a CAT5 cable. The connection encompasses the transmission of video signals and control commands as well as the cameras' power supply.

- + Conversion of the camera's video output signal to a differential signal for increased transmission quality.
- + Transformation of the 24 V DC power supply from the video central unit to the required standard 12 V DC camera power supply
- + Integration of the RS-485 data cable for transmitting the camera control commands.
- + Housing with preconfigured connection cable for camera connection and RJ45-coupling for the CAT5 cable's plug connection. Internal electronic circuits encapsulated to increase the protection class.

AHD-VSC C

Power supply	24 V DC (+30% / -25%)
Current consumption	Electronics: 60 mA (24 V DC) Output: 12 V / 1 A
Dimensions (Ø x L)	35 mm x 85 mm
Degree of Protection	IP 20
Weight	approx. 0.1 kg
Operation temperature	-30 °C ... +55 °C
Storage temperature	-50 °C ... +85 °C

AHD-VSC CB item-no. 14551

Video Signal Converter for
AHD-VC Cameras with BNC Plug

Same function as AHD-VSC C, BNC connection

Specifications: see AHD-VSC C (Item-no. 11720)

AHD-VSC CFV item-no. 13684

Video Signal Converter
for FLIR Voyager

The video signal converter AHD-VSC CFV is used for connecting a Voyager camera by FLIR Systems to the video distribution central unit AHD-VDCU with a CAT5 cable. The signal converter integrates video signal transmission and camera control commands.

Specifications: see AHD-VSC C (item-no. 11720)



AHD-VSC CF item-no. 13574

Video Signal Converter
for FLIR Navigator II

As AHD-VSC CFV (item-no. 13684),
but for FLIR Navigator II cameras.

Specifications: see AHD-VSC C (item-no. 11720)

AHD-VSC QC item-no. 11957

Video Signal Converter
for Video Quad-Screen
Processor Unit

The video signal converter AHD-VSC QC is used for connecting the video quad-screen processor unit AHD-VSC Q4-1 to the video distribution central unit AHD-VDCU with a CAT5 cable and BNC plug.

Specifications: see AHD-VSC C (item-no. 11720)



HM-Series, FLIR Systems item-no. on request

Portable Thermal Imaging Camera for Maritime Applications

Portable thermal imaging cameras for maritime applications (no integration into the video control system AHD-VCS).

HM-series thermal imaging cameras are portable and impact resistant. They create a crisp image, even in the darkest night, dramatically increasing your ability to observe your environment. The HM-series can be used on all types of vessels. Many yachts, merchant vessels, working vessels, as well as police and government boats can profit from the thermal imaging cameras' performance.

- + Image sensor focal plane, vanadium oxide (Vox), micro bolometer, uncooled
- + 240 x 180 pixels (HM-224), 320 x 240 pixels (HM-324 XP+)
- + Spectral range 7.5 ... 13.5 μm
- + Viewing angle 24° (h) x 18° (v), 12° (h) x 9° (v) with 2 x extender lens
- + Thermal sensitivity < 50 mK at f1.0 and + 25°C
- + Frame rate 8.3 Hz PAL/7.5 Hz NTSC
- + Internal LCD screen
- + Image storage single frame, standard JPEG (HM-324 XP+)
- + Video storage 9 Hz, full frame, MPEG4, (appr. 8 sec./MB) (HM-324 XP+)
- + Image polarity white-hot or black-hot, selectable
- + SD card slot for 1 GB card, USB 2.0 (HM-324 XP+)
- + Video output PAL or NTSC composite video, RCA coupling

Power supply	4 x AA NiMH Akku (incl.)
Battery Service Life	> 5 h
Dimensions (W x H x D)	240 mm x 85 mm x 60 mm (HM-224)
	265 mm x 85 mm x 75 mm (HM-324 XP+)
Degree of Protection	IP 67
Weight	approx. 0.66 kg (HM-224)
	approx. 0.97 kg (HM-324 XP+)
Operation temperature	0 °C ... +50 °C (HM-224)
	-20 °C ... +60 °C (HM-324 XP+)
Storage temperature	-20 °C ... +70 °C (HM-224),
	-40 °C ... +75 °C (HM-324 XP+)



M-Series, FLIR Systems item-no. on request

Premium Multi-Sensor Systems for Maritime Applications

The M-series combines a thermal imaging camera with a highly sensitive low light camera. It provides a crisp, clear thermal image in complete darkness and light fog or smoke. Integrated in a small, ultra compact gimbal, it is suitable for even the most demanding applications at sea.

The FLIR M-series provides the optimal instruments for navigation at night, on-board safety, man-over-board situations, protection from piracy, and many other applications. The FLIR M-series sets the standard for maritime thermal imaging systems by which all others are measured.

- + Combined thermal imaging and high-sensitivity low light camera with controllable pan/tilt head
- + Stepless 360° pan, tilt +/- 90°
- + Image sensor focal plane, vanadium oxide (VOx) micro bolometer, uncooled
- + 640 x 480 pixels (thermal image M-626L), 320 x 240 pixels (thermal image M-320L, M324XP)
- + Spectral range 7.5 ... 13.5 µm
- + Viewing angle 26° (h) x 20° (v) with 35 mm lens
- + Thermal sensitivity < 50 mK at f/1.0 and +25° C
- + Low light camera (M-626L, M-320L) 1/2" Interline Transfer CCD
- + Different versions available

Power supply	12 V DC ... 24 V DC (-10% / +30%) (Supply directly connected to camera)
Current consumption	25 W nominal, max. 50 W
Dimensions (Ø x H)	178 mm x 279 mm
Degree of Protection	IP 66
Weight	approx. 4.1 kg
Operation temperature	-25 °C ... +55 °C
Storage temperature	-40 °C ... +85 °C



MU/MV-Series, FLIR Systems item-no. o. req.

Premium Multi-Sensor Systems for Maritime Applications

The FLIR MU-series is the technologically most advanced thermal night vision system available to the maritime industry today. It is a powerful, gyro stabilized multi-sensor, long range, thermal night vision system.

FLIR MV-series provides a thermal imaging camera equipped with an uncooled Vanadium Oxide (VOx) detector producing thermal images of 640 x 480 pixels. It is the more affordable multi-sensor solution. The thermal imaging camera zooms in a field of view between a 24.5° and a 4°.

- + Stepless 360° pan, tilt +/- 90°
- + Active gyro stabilization provides steady images, even in rough seas
- + Radar tracking
- + Video tracking: the user can select a given target that can be automatically tracked by the video tracker
- + Picture-in Picture mode
- + Digital detail enhancement (DDE) ensures a crisp thermal image even in scenes with extreme temperature dynamics
- + Different versions available

Power supply	12 V DC ... 24 V DC (-10% / +30%) (Supply directly connected to camera)
Current consumption	75/100 W nominal, max. 200 W
Dimensions (Ø x H)	510 mm x 454 mm
Degree of Protection	IP 66
Weight	approx. 27 kg
Operation temperature	-30 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C



Voyager II, FLIR Systems

item-no. 13464

Gyro Stabilized Multi-Sensor Thermal Imager for Night Applications

Gyro stabilized thermal imager with pan/tilt for maritime night vision applications. Powerful multi-sensor night vision system operating in the mid-range of the infrared spectrum. It encompasses two thermal imaging cameras and one high-sensitivity low light camera. Ideal for navigation and environmental observation. Allows the user to zoom in on very small or distant objects. It also allows recognition of human sized objects at a distance of over 2 km. Objects 2.3 m x 2.3 m in size that are drifting on the water can practically be recognized even in complete darkness, through smoke, light fog, and in the most diverse weather conditions at a distance of 6 km.

Voyager II can be connected to a radar system in a so-called "slew to crew" configuration. Voyager II can identify and track radar targets, using the National Marine Electronics Association (NMEA) 0183 protocol.

When activated and when an object has been recognized, Voyager II automatically turns to the correct direction and tracks the object, so that you can clearly recognize what the blip on the radar screen really means.

Power supply	24 V DC (-10% / + 30%) (Supply directly connected to camera)
Current consumption	50 W nominal, max. 130 W, with heating max. 270W
Dimensions (Ø x H)	381 mm x 584 mm
Degree of Protection	IP 66
Weight	approx. 20.4 kg
Operation temperature	-25 °C ... +55 °C
Storage temperature	-50 °C ... +85 °C





Trim Tabs Control System

Developed and patented by Böning, the electrohydraulic trim tabs control system was designed for use with fast yachts whose cruising behavior is significantly affected by controlling the trim tabs.

The backboard or starboard trim tabs' single or dual action electrohydraulic cylinders are controlled with the electronic directional valves of the hydraulic aggregates AHD-TCS HYD. A particular characteristic of the system is the dispensation of cabling, which is often prone to error, on the vessel's exterior.

Instead of customary hydraulic displacement transducers, special flow meters converting the movement of the hydraulic fluid into impulses are used. These impulses are processed by the electronic control unit AHD-TCS A and are used for the exact calculation of the trim tab positions.

Automatic trim tab retraction ensures that the cylinders' pistons and gaskets are protected from fouling.

If the system is expanded with a GPS receiver (directly at the electronic control unit AHD-TCS A), the trim tabs can also be controlled in automatic mode. For this purpose, the optimal trim tabs' position at various cruising speeds is determined and saved during the shipyard side commissioning.

The electronic control unit AHD-TCS A transmits all data over a CAN bus. Thus, the trim tabs position can be depicted graphically (visually) on a color display (e. g. AHD 651 or AHD 880). The display can also be part of an existing ship alarm system. It is accessed directly by the electronic control unit AHD-TCS A via two analog outputs (0-10 V DC).

The control unit, display, and optional control instruments can be cascaded (e. g. for fly bridge). Control electronics failure is detected via CAN bus and shown on the connected displays.



AHD-TCS A

item-no. 10167

Electronic Control Unit for Trim Tabs Control System AHD-TCS

AHD-TCS A is the central control unit of the Trim Tabs Control System AHD-TCS. It processes all sensor data and transmits these data via CAN bus to a color display (e. g. AHD 651 or AHD 880) for visualization.

A failure of the control electronics is captured via CAN bus and indicated on a connected display. Even when the control unit AHD-TCS A fails the trim tabs can be controlled with the operation panel AHD-TCS OP A.

Three additional outputs are available for the direct control of analog position indicators.

- + Optional capture and evaluation of the current inclination angle
- + Electronics unit in profile carrier housing, suitable for carrier rail mounting (TS32/32)

Recommended accessories:

- Operation panel **AHD-TCS OP A** (item-no. 10168)
- **AHD-TCS INCL** Inclination sensor for measuring the inclination angle (item-no. 11944)

Inputs	2 x flowmeter, 1 x operation unit
Outputs	2 x hydraulic aggregates, 3 x gauges
Interfaces	1 x CAN (galvanically isolated), 1x RS-232
Power supply	24 V DC (+30% / -25%)
Current consumption	0.15 A @ 24 V DC (electronics)
Dimensions (W x H x D)	215 mm x 120 mm x 48 mm
Degree of Protection	IP 10
Weight	approx. 0.7 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °



AHD-TCS OP A

item-no. 10168

Operating Panel for Trim Tabs Control System AHD-TCS

Enables manual or automatic operation of the electrohydraulic Trim Tabs Control System AHD-TCS.

- + Compact design for inside and outside operation
- + Illuminated push buttons, automatic dimming of LEDs
- + Connection to control unit AHD-TCS A with 8-pole cable
- + Cascadable (e. g. for installation in fly bridge, bridge)

Inputs	1 x input (feedback)
Outputs	5 x output (key commands)
Power supply	24 V DC (+30% / -25%)
Current consumption	0.1 A @ 24 V DC
Dimensions (W x H x D)	70 mm x 130 mm x 94 mm
Degree of Protection	IP 66 (front) IP 10 (rear)
Weight	approx. 0.25 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °



AHD-TCS INCL

item-no. 11944

Inclination Angle Sensor for Trim Tabs Control System AHD-TCS

In conjunction with operation panel AHD-TCS A, the inclination angle sensor AHD-TCS INCL enables optimizing the trim tabs positioning, depending on the heel while cruising. Version with mounting flange.

Power supply	20 ... 30 V DC
Ausgang	4 ... 20 mA
Dimensions (W x H x D)	40 mm x 41 mm x 52 mm
Degree of Protection	IP 67
Weight	approx. 0.1 kg



AHD-TCS HYD

item-no. 10793

Hydraulic Aggregate for Trim Tabs Control System AHD-TCS

- AHD-TCS HYD is a complete hydraulic aggregate for hydraulic control of single or double-action cylinders operating trim tabs. Each trim tab requires a separate hydraulic aggregate.
- + Mounting plate for installation close to the trim tabs
 - + Available in versions with hydraulic aggregates for 1 or 2 trim tabs
 - + Hydraulic pump with terminal clamps for 24 V DC power supply
 - + Hydraulic oil container min. 0.75 l
 - + Distribution block with flow meter, incl. terminal clamps for 24 V DC
 - + Power supply and signal outputs (pulse left/right)

Not included in delivery: hydraulic cylinders for the trim tabs, tubes for the hydraulic cylinders and other installation material.

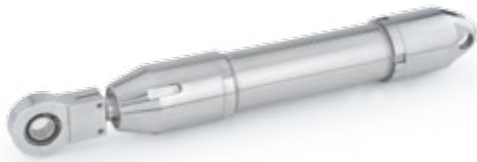
Inputs	Aggregate (control up, down)
Outputs	Flow (signal up, down)
Power supply	24 V DC (+30% / -25%)
Current consumption	typ. 16 A @ 24 V DC
Dimensions (W x H x D)	240 mm x 351 mm x 200 mm
Degree of Protection	IP 56
Weight	approx. 11 kg
Operation temperature	-25 °C ... +70 °C
Storage temperature	-30 °C ... +85 °C



Draghetti Marine Division

Trim Tabs

- **MD 350** 300 mm x 310 mm (item no. 14232)
- **MD 500** 500 mm x 310 mm (item no. on request)
- **MD 750** 750 mm x 410 mm (item no. on request)
- **MD 800** 800 mm x 410 mm (item no. on request)
- **MD 1000** 1000 mm x 460 mm (item no. on request)
- **MD 1800** 1800 mm x 460 mm (item no. on request)



Draghetti Marine Division

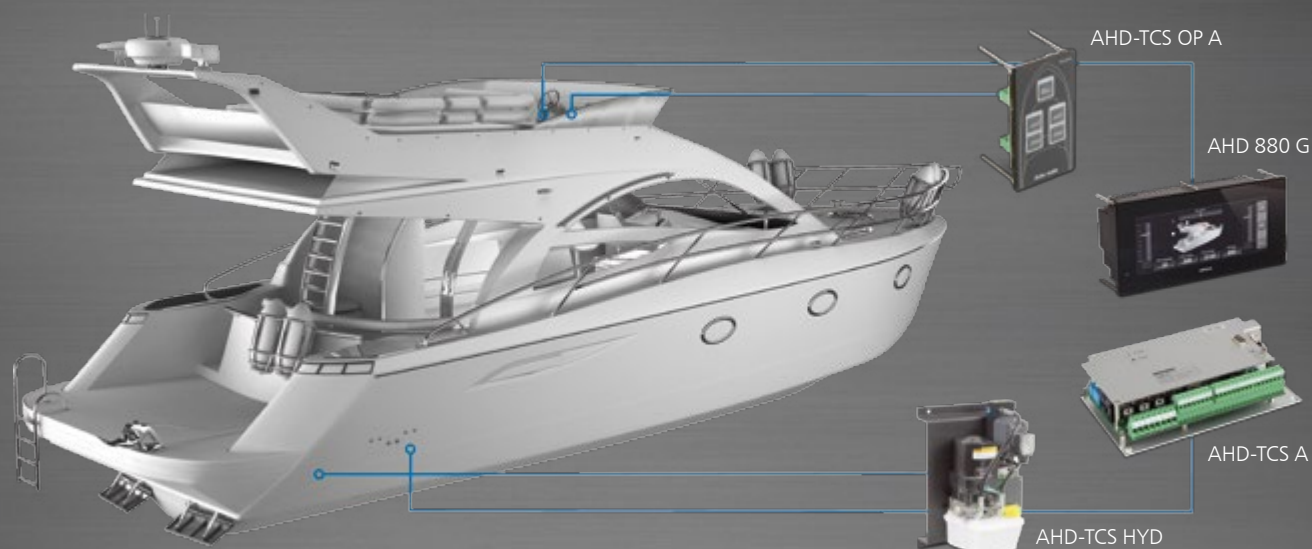
Hydraulic Cylinders

Version **MD 1632** (item no. 14230)

Type	Double effect
Stroke	80 mm
Pressure	90 bar
Connections	M12 x 1.5
Weight	3.85 kg
Force	6360 N

Version **MD 2540** (item no. on request)

Type	Double effect
Stroke	80 mm
Pressure	90 bar
Connections	M12 x 1.5
Weight	5.705 kg
Force	11309 N



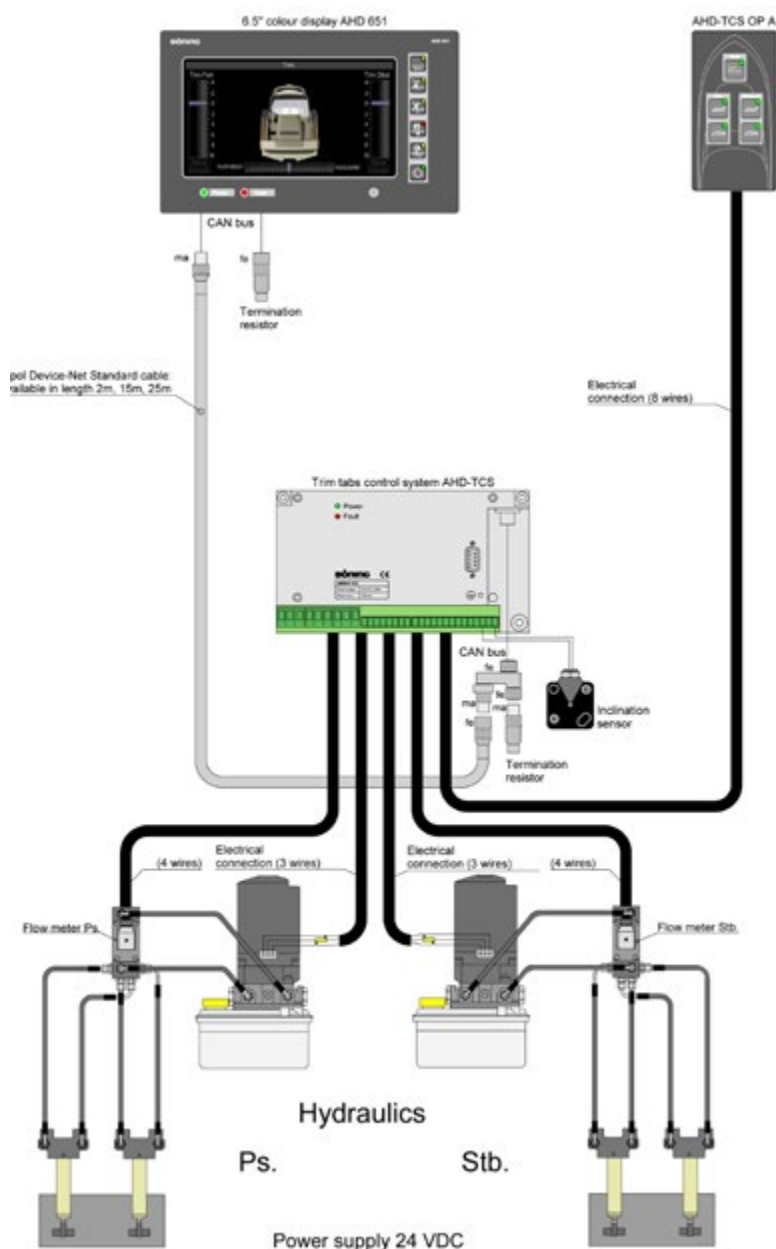
New Function for Böning Trim Tabs Control System

As of now, the innovative Trim Tabs Control System ADH-TCS can also be ordered with an optional inclination sensor. While cruising, the ship's electronics unit automatically compensates for inclinations caused by e. g. asymmetrical loads, cross winds, or sea currents. The speed-dependent automatic control system improves the yacht's maneuverability and furthermore achieves a fuel savings of up to 10 % at top speed.

Each optimal trim tab position is precisely calculated by a patented process using flow meters at the hydraulic pump. The system is maintenance friendly and robust, since no sensors are installed on the exterior of the vessel's hull.

Thanks to a special cooperation with the Italian hydraulics specialist Draghetti Marine, we can assemble a complete system, tailored to the customer's individual requirements. In addition, our partner has further improved his trim tabs. The new generation's curved design offers greater buoyancy over conventional trim tabs of the same size.

The electronic control unit AHD-TCS A transmits all data over a CAN bus. Thus, the trim tab position can be shown graphically (visually) on a color display (e. g. AHD 651 or AHD 880 TC). The display can be part of an existing ship alarm system. The control unit, display, and optional control instruments can be cascaded (e. g. for fly bridge). Control electronics failure is detected via the CAN bus and shown on the connected displays.



Diesel Engine Monitoring and Safety Systems

With the new AHD 514 system components, we provide a compact monitoring system for ship main engines and gensets. All required inputs and outputs as well as the corresponding monitoring and control functions are fully integrated. The system encompasses a monitoring unit with start/stop function, a safety unit with integrated emergency stop function, as well as a display and control unit with a 5.7" color display.

The components' design focuses on easy installation and operation. For the most part, the system components can be connected directly with terminal strips, leading to a significant reduction in material and installation costs. The system is approved by GL and other leading classification societies. The PC based configuration software, included in the delivery, makes it possible to adjust all necessary parameters at various user levels.

AHD 514 A Start/Stop System with Combined Alarm System for Diesel Propulsion Engines

Compact unit in module housing for console, switch panel, or control cabinet installation onto Profile Carrier Rails TS32/35. The AHD 514 A includes numerous inputs and outputs, whose functions are configurable for the most part. Thus, all required sensors, including engine speed and safety relevant (redundant) sensors are captured and processed. Threshold violations are alerted, and the engine is automatically stopped during overspeed. Various operational states can be transmitted via relay contacts. The diesel engine's start and stop, as well as alerting and presentation of all data, occurs via the connected Display and Operation Unit AHD 514 OP. Alarms and events are logged internally and can be retrieved at a later point. An optional remote control unit allows for controlling the system remotely.

AHD 514 S Safety System with Combined Emergency Stop System for Diesel Propulsion Engines

Compact unit in module housing for console, switch panel, or control cabinet installation onto Profile Carrier Rails TS32/35. All safety functions required by the classification societies, such as wire break monitoring of the inputs and outputs, are integrated. The emergency stop circuit includes a separate 24 V DC feed, which operates independently of the other safety functions. An initiated emergency stop is sent directly to the emergency stop exit. During an alarm, the safety relevant sensors activate the stop circuit. Alerts are reported locally via integrated LEDs as well as on a connected Display and Operation Unit AHD 514 OP.

AHD 514 OP Display and Operation Unit for AHD 514 Propulsion Diesel Monitoring System

Built-in device with 5.7" color display and keypad for local installation in the diesel engine's control cabinet and/or as remote control unit in the bridge console (optional). All relevant operational data are visualized on a bright, high resolution display (640 x 480 pixels, 500 cd/m²). The presentation is distributed in a clearly organized manner and across several pages. Current alarms are indicated by activating an internal buzzer and a red, flashing alert message. Built-in pushbuttons provide start and stop, alarm quit, and reset functionality, as well as the ability to navigate between pages.



AHD 514 A

item-no. 12972

Monitoring System for Diesel Engines: Alarm System with Combined Start/Stop System

The AHD 504/AHD 514 series diesel engine monitoring system has been designed as a compact solution for starting, stopping, and monitoring diesel engines on board of ships or in onshore installations. Combined with the Safety System AHD 514 S, it provides a complete package solution for wide-ranging fields of application.

AHD 514 A is an engine start/stop system with combined alarm system. The integrated processor system processes and monitors up to 15 sensors for the capture of currents and resistances, changeover contacts and engine speeds. Control inputs and potential free relays contacts round up the system to an compact reliable unit.

Electronics unit in profile carrier housing, suitable for carrier rail mounting (TS32/35.) The overall system is configured with an included software package, which allows individual adjustments at several authorization levels to various engine manufacturers' model series.

Inputs	15 x analog input (sensor type = 4-20 mA, PT100, PT1000, frequency or contact) 9 x optocoupler input: 1 x serial, 8 x control
Outputs	1 x analog (4-20 mA / 1-5 V / 2-10 V), 2 x serial optocoupler output (for example for AHD-R 101), 10 x switching output (start, stop, horn, common alarm, status and group alarms)
Interfaces	2 x CAN (galvanically isolated), 1 x serial (RS-232)
Power supply	24 V DC (+30% / -25%)
Current consumption	210 mA @ 24 V DC
Dimensions (W x H x D)	238 mm x 140 mm x 77 mm
Degree of Protection	IP 20
Weight	approx. 0.7 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS, RMRS, RINA, CRS



AHD 514 S

item-no. 12973

Monitoring System for Diesel Engines: Safety System with Emergency Stop

AHD 514 S is a safety system for monitoring all safety relevant (redundant) sensors and criteria according to classification society guidelines. integrated autonomous emergency stop system with separate feed, functional even during failure of the remaining alarm system. Processor system with autonomous data processing and direct alerting via potential-free contacts (horn activation and collective alarm).

Inputs with wire break monitoring for capturing 5 safety relevant sensors, 2 emergency stop switches as well as pulse generator (engine speed), 5 control inputs (acknowledgement, reset, override, and other functions), 4 universal relay outputs (system status and alerting), 2 switching outputs (wire break monitored) for engine safety stop and optional air flap. 1 analog output (4-20 mA, 1-5 V/2-10 V). 10 frontside LED indicators for direct, local fault indication.

Preconfigured standard version for shared operation with alarm system AHD 504 A/AHD 514 A.

Alternatively available as preconfigured device for standalone solutions (type: AHD 514 S1/item-no. 15431). additional customer specific solutions available on request.

Inputs	5 x binary inputs (sensor type = contact) 5 x optocoupler inputs (control)
Outputs	1 x analog (4-20 mA / 1-5 V / 2-10 V), 1 x serial optocoupler output, 7 x switching output (safety stop, emergency stop, horn, common alarm, status)
Interfaces	1 x CAN (galvanically isolated)
Power supply	24 V DC (+30% / -25%)
Current consumption	110 mA @ 24 V DC
Dimensions (W x H x D)	148 mm x 140 mm x 77 mm
Degree of Protection	IP 20
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS, RMRS, RINA, CRS



AHD 514 OP item-no. 12974

Monitoring System for Diesel Engines: Display and Operation Unit

AHD 514 OP is a 5.7" color display with integrated operating keypad for conveniently visualizing all relevant engine parameters.

- + Tabular and graphical presentation on several pages possible
- + Clear presentation of all active alarms on a separate page
- + Integrated menu navigation for direct changing of important basic settings (e. g. date/time, language, unit system)
- + Service functions on separate page
- + Keys for engine start/stop, page changing, acknowledgement, and reset
- + Automatically dimmed background lighting
- + Integrated buzzer
- + Device in aluminum housing suitable for installation in consoles, switch panels or the diesel engine's control cabinet

Interfaces	1 x CAN (galvanically isolated)
Power supply	24 V DC (+30% / -25%)
Current consumption	200 mA @ 24 V DC
Dimensions (W x H x D)	144 mm x 144 mm x 50 mm
Degree of Protection	IP 56 (front) IP 20 (rear)
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +70 °C (according to RMRS Part IV Section 3.10)
Storage temperature	-50 °C ... +80 °C
Approvals	GL, DNV, LR, BV, ABS, RMRS, RINA, CRS



AHD 504 A item-no. 14639

Monitoring System for Diesel Engines: Alarm System with Combined Start/Stop System

AHD 504 A is an engine start/stop system with combined alarm system for monitoring all necessary sensors and parameters. Integrated processor system with autarkic data processing and direct alerting via potential free contacts (horn activation and collective alerting).

15 input channels for capturing power, current, and resistance sensors, changeover contacts, thermocouples (NiCrNi), and pulse generator (engine speed)

6 control inputs (start, stop, acknowledge, and other functions), 3 universal relay outputs (system status and alerting), control outlet for starter relay, 1 changeover output (wire break monitored) for engine stop.

Optional Modbus module (RS-422/RS-485)

The included PC software package allows individual adjustments to various engine manufacturers' model series at several authorization levels.

Inputs	15 x Analog-input (Sensor type = 4-20 mA, PT100, PT1000, frequency or contact) 7 x optocoupler input: 1 x serial, 6 x control
Outputs	1 x serial optocoupler output (for example for AHD-R 101), 6 x switching output (start, stop, horn, common alarm and status alarms)
Interfaces	2 x CAN (galvanically isolated), 1 x serial (RS-232)
Power supply	24 V DC (+30% / -25%)
Current consumption	210 mA @ 24 V DC
Dimensions (W x H x D)	166 mm x 128 mm x 55 mm
Degree of Protection	IP 20
Weight	approx. 0.5 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS, RMRS, RINA, CRS



AHD 504 NG

item-no. 14377

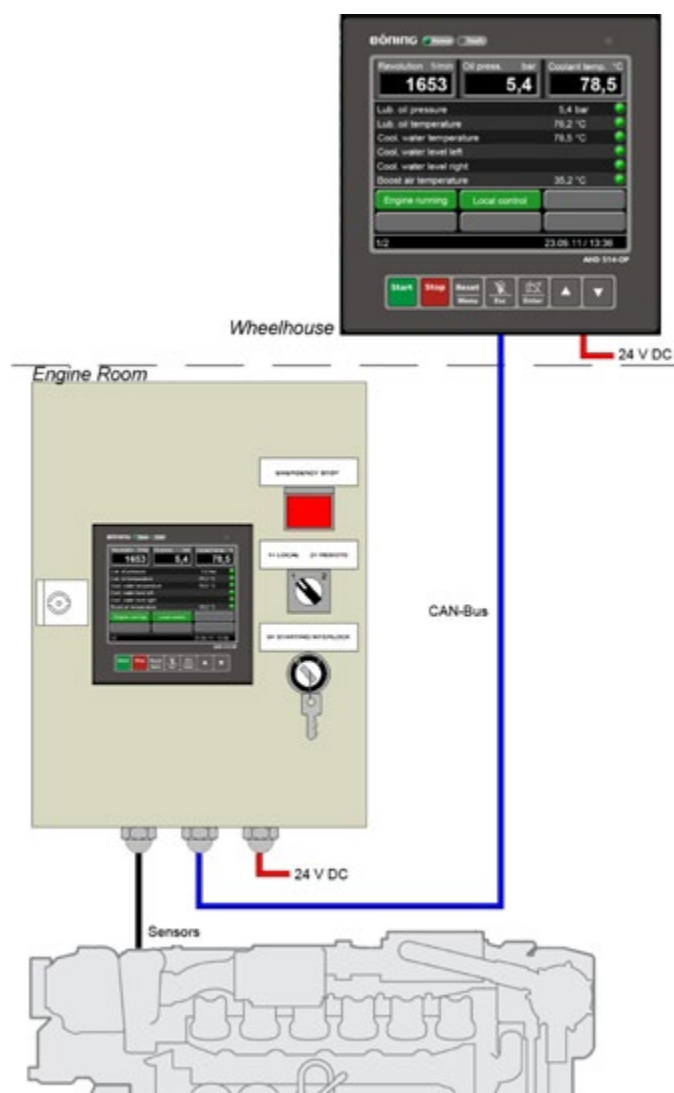
Alarm System for Monitoring Generators

The module AHD 504 NG for measuring power grids and generators is designed as an extension unit of the AHD 504/AHD 514 series Böning monitoring system and can be integrated into this system, if needed.

AHD 504 NG is an alarm system for monitoring the voltages and frequencies of a 3-phase generator power grid. The module captures the current and frequency of the 3 alternating current phases separately and initiates an alarm, if predefined thresholds are exceeded. Operational data and alarm states are transmitted to a higher ranking alarm system via CAN bus, where they are visualized.

PC software for system configuration included.

Interfaces	1 x CAN (galvanically isolated)
Power supply	24 V DC (+30% / -25%)
Current consumption	50 mA @ 24 V DC
Dimensions (W x H x D)	92 mm x 128 mm x 55 mm
Degree of Protection	IP 20
Weight	approx. 0.25 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS, RMRS, RINA, CRS





AHD 414 item-no. 8765
Automatic Diesel Start/Stop Control (24 V DC)

The AHD 414 start/stop Diesel control is a compact unit, designed for starting, stopping, and monitoring diesel engines. Individually configurable functions allow the adaptation to various requirements (solenoid or operating solenoid, number of start attempts, pre-heating function, and others). Suitable for monitoring diesel aggregates, emergency diesel or smaller propulsion engines.

- ✦ 4 input channels with wire break monitoring for reading binary sensors
- ✦ 3 control inputs for start blocking, remote start, remote stop
- ✦ Input for engine speed monitoring with safety stop
- ✦ Frontside operation keys for engine start, engine stop, acknowledgement, and reset
- ✦ Frontside LED for optical alerting, can be labeled with foil insert
- ✦ Switch panel mounted device, suitable for installation in consoles and switch boards or the diesel engine's control cabinet.

Inputs	3 x optocoupler inputs (control)
Outputs	1 x serial optocoupler output (remote control), 7 x switching output (start, stop, horn, common alarm, status)
Power supply	24 V DC (+30% / -25%)
Current consumption	200 mA @ 24 V DC
Dimensions (W x H x D)	144 mm x 144 mm x 53 mm
Degree of Protection	IP 20 IP 54 (front with protection cover)
Weight	approx. 0.5 kg
Operation temperature	-25 °C ... +55 °C
Storage temperature	-30 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS



AHD 414 A item-no. 4097
Compact Alarm and Safety System

AHD 414 A alarm and safety system is a compact unit for monitoring and displaying alarm and status criteria; Individually configurable functions allow the adaptation to various requirements (function as alarm or safety system, override, alarm release, activate group relays, and others);

- ✦ 10 input channels with wire break monitoring for capturing binary sensors
- ✦ 3 control inputs for acknowledgement and alarm release
- ✦ Frontside operating keys for acknowledgement and reset
- ✦ Frontside LED for optical alerting, can be labeled with foil insert
- ✦ 4 switching outputs (positive)
- ✦ 3 switching outputs, potential free (collective alerting and activation of acoustic signal generators)
- ✦ Switch board mounting device, suitable for installation in consoles or switch boards

Inputs	3 x optocoupler inputs (control)
Outputs	1 x serial optocoupler output (remote control), 7 x switching output (start, stop, horn, common alarm, status)
Power supply	24 V DC (+30% / -25%)
Current consumption	200 mA @ 24 V DC
Dimensions (W x H x D)	144 mm x 144 mm x 53 mm
Degree of Protection	IP 20 IP 54 (front with protection cover)
Weight	approx. 0.5 kg
Operation temperature	-25 °C ... +55 °C
Storage temperature	-30 °C ... +85 °C
Approvals	GL, DNV, LR, BV, ABS

Engine Monitoring Systems

Modern engines are equipped with highly sophisticated control electronics. The operating state is continuously monitored by numerous sensors and forwarded by powerful interfaces, such as CAN bus (Controller Area Network) or Modbus. Here, every manufacturer pursues his own philosophy.

We have set ourselves the task of presenting the engine data clearly and well-organized to the operator.

To this end, we have developed special displays that meet the requirements of the shipping industry. The sunlight readable and water resistant displays can also be used on open bridges.

In recent years, we have developed several converters that can be adjusted to various engine protocols.

Today, we are in a position to analyze and further process data from all major manufacturers, such as MAN, MTU, CAT, Volvo Penta, Cummins, Yanmar, and others.

While many products only visualize an engine's basic data, the measured values shown on a Böning display are very detailed.

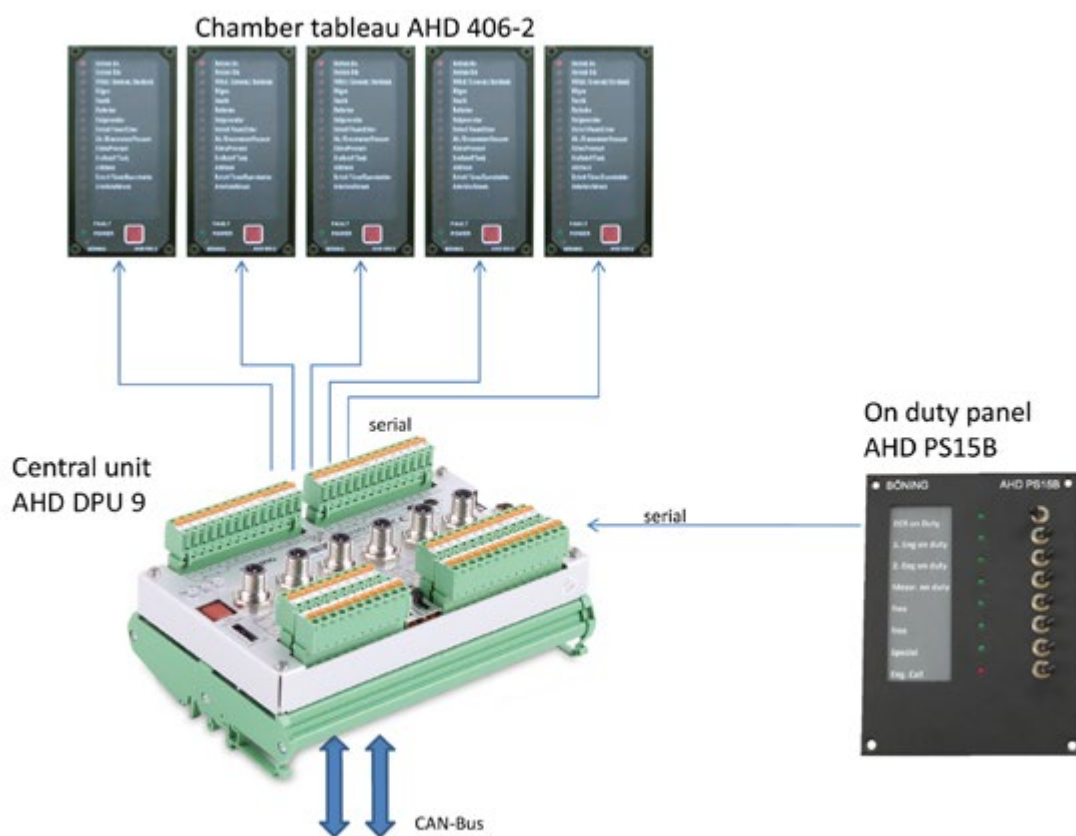
For example, an alert message is displayed in plain text, since here a quick reaction is often needed to avoid further damages. We not only replace the original manufacturer's display, our visualizations also provide a heightened ease of use.

The engine monitoring system can operate independently, but it can also be combined with other Böning systems. Integrating the alarm system also allows for other comfort functions, such as trip fuel consumption and calculation of the remaining range.

We provide suitable solutions for ships with single engines (e. g. sail boats) and the customary dual-engine ships as well as vessels with three or four propulsion engines.

The hardware is approved by the leading classification societies, so that safe operation and longevity can be ensured.





On-Duty / Engineer Call System

The type approved components of the watch standby and engineer call system are used on board ships that are classified for use with permanently or temporally unmanned engine rooms.

The system consists of:

- On-duty/engineer call panel **AHD-PS 15 B**
(installed in e. g. the engine control room ECR)
- Cabin duty alarm/engineer call panel **AHD 406-2**
(installed in the living and communal areas
(e. g. mess halls) of the duty personnel)
- Central data station **AHD-DPU 9** (page 29)

Invalid states (e. g. alarms) and status messages are assigned to alarm or indication groups and forwarded to the cabin duty alarm/engineer call panels AHD 406-2 and if necessary, to the bridge panel or a bridge display (e. g. AHD 1215) via the serial outputs.

The operational states "Engine Room Manned" or "Engine Room Unmanned" are selected with the switches on the front side of the on-duty/engineer call panel AHD-PS 15 B. Once the engine room has been switched to unmanned, the duty officer must also be selected. If this does not occur within a time frame defined during configuration, the engineer call is automatically initiated on the bridge and all cabin duty alarm/engineer call panels. An automatic engineer call is also initiated, if an initiated alarm is not quit at the operation panel of the ship alarm and monitoring system within a certain time frame (configurable).

Additionally, the engineer call can also be manually initiated from the on-duty/engineer call panel AHD-PS 15 B and a corresponding switch on the bridge (via binary input on the AHD-PS 15 B unit).

Alarms are reported visually with individual group LEDs and the internal buzzer on the cabin duty alarm/engineer call panels AHD 406-2. The horn relay is also activated. The acoustic alarm can be quit separately on each panel, but the optical alarm can only be quit from the ship alarm and monitoring system's control station. In addition, each of the cabin duty alarm/engineer call panels AHD 406-2 includes a separate 24 V DC power input for manual engineer call and according to regulations, one alarm input for optical and acoustic fire alerting.

**AHD 406-2**

item-no. 8728

Cabin Duty Alarm/Engineer Panel

The type approved components of the cabin duty alarm and engineer call system are used on board vessels that have been classified for wholly or partially unmanned engine rooms.

The cabin and mess panel AHD 406-2 is used for alerting alarm groups in the duty officers' cabins or in the mess. This function is provided only in conjunction with a fully installed duty alarm system.

Data capture via serial input channel, alerting of 15 groups; 2 separate inputs for fire alarm and eng. call; frontside operating key for acknowledgement and reset; frontside LED for optical alerting, can be labeled with foil insert; switching outputs for activating acoustic signal generators;

Switch panel mounted device, suitable for installation in consoles or switch panels.

Inputs	2 x optocoupler input (engineer call, fire)
Outputs	1 x switching output (horn)
Interfaces	1 x optocoupler input (serial IN)
Power supply	24 V DC (+30% / -25%)
Current consumption	200 mA @ 24 V DC
Dimensions (W x H x D)	72 mm x 144 mm x 33.5 mm
Degree of Protection	IP 20 IP 22 (front)
Weight	approx. 0.5 kg
Operation temperature	-25 °C ... +70 °C
Storage temperature	-30 °C ... +85 °C
Approvals	GL, DNV, LR, CRS

**AHD-PS 15 B**

item-no. 10883

On Duty/Engineer Call Panel

The type approved components of the cabin duty alarm and engineer call system are used on board vessels that have been classified for wholly or partially unmanned engine rooms.

The on-duty/engineer call panel AHD-PS 15 B is used for the watch duty (on-duty officer or mess) during unmanned engine room. This function is available only in conjunction with a fully installed watch duty system.

Front plate equipped with up to 7 selector switches, incl. LEDs for optical watch-duty indication, can be labeled with foil insert, 1 separate input for add-on functions; 3 x data output serial (optocoupler 2-pin, plus and minus switching); switch panel mounted device, suitable for installation in consoles or switch panels.

Inputs	8 x internal (duty selector switch)
Interfaces	1 x optocoupler output (serial out)
Power supply	24 V DC (+30% / -25%)
Current consumption	65 mA @ 24 V DC
Dimensions (W x H x D)	100 mm x 130 mm x 50 mm
Degree of Protection	IP 20
Weight	approx. 1.0 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL

Standby Pumps and Compressor Controls

Several AHD 408 components are available for controlling and monitoring standby pumps and compressor pumps. The devices are optimized for control cabinets and can be operated directly with frontside switches. The device internal logic facilitates direct control of pumps and compressors, even during failure of the monitoring system. Pump/compressor pairs or two connected pumps each are monitored. Switching or selection occurs automatically in critical cases, such as pressure loss. Optionally, the device is delivered with a front cap to increase the protection class.

Additional properties: All operating states are indicated by LEDs on the front side, relay output for alarms, activation delay after power failure, frontside text field (changeable).



AHD 408 E item-no. 8783

Dual Standby-Pump Control for Electrically Driven Pump Pairs

AHD 408 E is a standby pump control device for 2 electrically driven pairs of pumps (main pump and standby pump) each; suitable for universal use on ships; 2-channel system, both pump pairs operate independently from one another; pressure is monitored for each pump circuit; alerting and automatic changeover from main pump to standby pump during drop in pressure; automatic test of standby pump during system start; startup delay after blackout; 2 x 2 switching contacts 230 V AC for pumps; 2 transistor outputs for alerting; frontside switches for powering on and off as well as defining the main pump; LEDs for alarm and operational indication with lamp test function; serial port for remote operation (on request); Switch panel mounted device, suitable for installation in consoles or switch panels.

Inputs	3 x contact (pump pressure, blackout)
Outputs	2 x 2 switching relays 230 V AC, 2 x transistor switches (alarm)
Interfaces	1 x optocoupler input (serial IN)
Power supply	24 V DC (+30% / -25%)
Current consumption	300 mA @ 24 V DC
Dimensions (W x H x D)	72 mm x 144 mm x 216 mm
Degree of Protection	IP 20 IP 54 (front with protection cover)
Weight	approx. 1.0 kg
Operation temperature	0 °C ... +70 °C
Storage temperature	0 °C ... +85 °C
Approvals	GL



AHD 408 A

item-no. 8784

Dual Standby Pump Control for Attached Pumps

AHD 408 A is a standby pump control device for 2 electrically driven standby pumps, designed for interacting with attached main pumps (powered via diesel aggregate or main engine); suitable for universal use on ships;

2-channel system, both pump circuits are monitored independently; engine speed monitoring for main engine; the standby pumps and alarms are automatically activated during a drop in pressure; 2 switching contacts 230 V AC for pumps; 2 transistor outputs for alerting; frontside switches for powering on and off; LEDs for alarm and operational function with lamp test function;

Switch panel mounted device, suitable for installation in consoles or switch panels.

Inputs	5 x contact (pump pressure, engine speed control)
Outputs	2 x switching relays 230 V AC, 2 x transistor switches (alarm)
Interfaces	1 x optocoupler input (serial IN)
Power supply	24 V DC (+30% / -25%)
Current consumption	300 mA @ 24 V DC
Dimensions (W x H x D)	72 mm x 144 mm x 216 mm
Degree of Protection	IP 20 IP 54 (front with protection cover)
Weight	approx. 1.0 kg
Operation temperature	0 °C ... +70 °C
Storage temperature	0 °C ... +85 °C
Approvals	GL



AHD 408 E-K

item-no. 8786

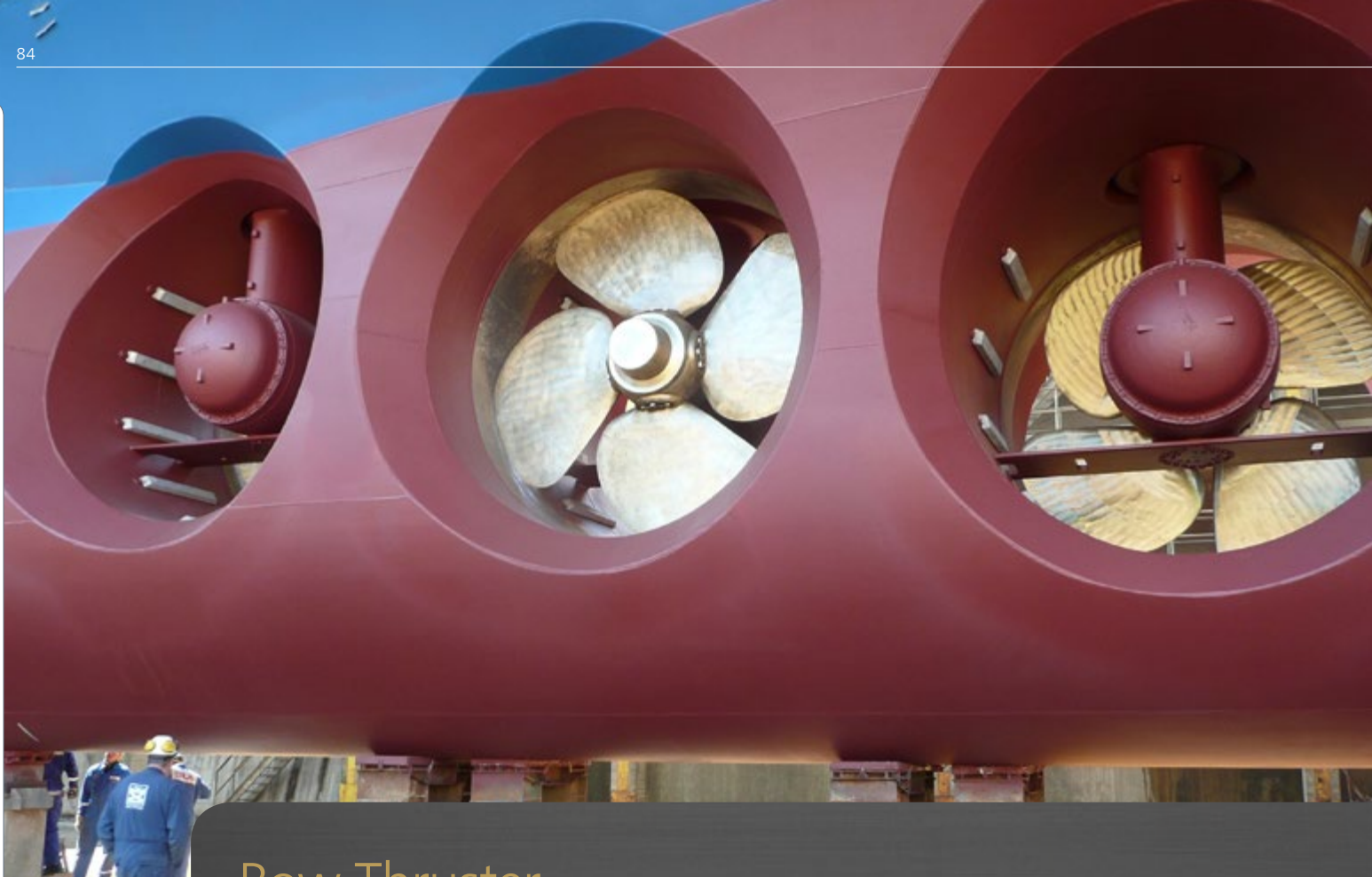
Combined Standby Pump and Compressor Control

AHD 408 E-K is a device combination comprised of a standby control for 1 electrically driven pump pair (main pump and standby pump) as well as compressor control for 1 electrically driven compressor pair; suitable for universal use on ships.

Both systems operate independently from one another; each system is pressure-monitored; automatic changeover or activation of standby operation at low pressure; alerting dependent on function; automatic testing of standby pump at system start; startup delay after blackout; compressor control with multiple step pressure monitoring; 2 x 2 switching contacts 230 V AC for pumps or compressors; 2 transistor outputs for alerting; frontside switches for powering on and off as well as defining the main pump or compressor; LEDs for alarm and operation indicators with lamp pest function;

Switch panel mounted device, suitable for installation in consoles or switch panels.

Inputs	5 x contact (pump pressure, pressure monitoring)
Outputs	2 x 2 switching relays 230 V AC, 2 x transistor switches (alarm)
Power supply	24 V DC (+30% / -25%)
Current consumption	300 mA @ 24 V DC
Dimensions (W x H x D)	72 mm x 144 mm x 216 mm
Degree of Protection	IP 20 IP 54 (front with protection cover)
Weight	approx. 1.0 kg
Operation temperature	0 °C ... +70 °C
Storage temperature	0 °C ... +85 °C
Approvals	GL



Bow Thruster Control

The components AHD 501 and AHD 502 allow for full control and monitoring of a bow thruster with 3-phase asynchronous motor (slip-ring rotor) with a fixed propeller. In addition to reversing the contactor in both directions, the power stages 70 %, 85 %, and 100 % can be selected directly, while the auxiliary stages prevent excessive start voltages.

The central unit AHD 501 is installed in the drive section or the control cabinet of the bow thruster. The unit monitors all feedback messages, captures all current and temperature sensors, and processes the communication with the control units AHD 502. All control commands are captured by the central unit via a CAN bus. All relevant measured data and feedback messages are displayed on the helms; faults and critical states are monitored. Depending on the malfunction or the degree of overload, the system responds by reducing the power or initiating a stop. Additional properties: fan speed control, oil level monitoring, control current monitoring, 2-stage capture of engine current, input for direct locking of the 100 % stage, diagnostic USB port.

The control unit AHD 502 allows for convenient monitoring and control of the bow thruster. Up to 3 identical units, which are generally installed on the bridge and both wing control helms (Bb. and Stb.), can be used. The control unit is optimized for flush mounting. Each stage can be accessed directly from the control buttons. Keys for controlling the displays, quit, and emergency stop are also present.

The integrated 3.5" color display is dimmed automatically and presents all important operating states, such as current consumption, stage, and direction, in a clearly viewable manner. Alarms are reported acoustically and optically. In addition, there are potential free contacts for general alarm and connection to an external whistle.

The control units communicate with one another and the central control unit AHD 501 over separate CAN networks. Here, all necessary terminating resistors are already integrated. The cabling effort is significantly reduced, compared to traditional systems.

Additional properties: integrated "Power Request" button for power requests to the power management system with feedback indicator, port for external joystick, fault detection and service function for system states, menu for setting the overcurrent limits, RS-422 port for accessing a voyage data recorder according to IEC-61162-1 (proprietary).

**AHD 501**

item-no. 12028

Electr. Bow Thruster Control – Central Unit

AHD 501 is a central bow thruster control unit for electrically driven bow thrusters with a 3-phase asynchronous motor (slip-ring rotor) and attached fixed propeller. In conjunction with the display and control unit AHD 502 (see item-no. 12369), this provides a complete package solution which fully covers all requirements pertaining to control and monitoring functions.

Direct control of direction, stage, and interstage contactors including feedback monitoring; control of the 3 main stages (70 %, 85 %, 100 %) and up to 6 intermediate stages per effective direction; automatic fan control and monitoring; control of an engine brake; monitoring of engine current, winding temperatures (in the engine) and oil level; contactor (circuit breaker) control voltage check; external locking of the 100 % stage; 13 high load switching outputs for direct contactor and circuit breaker control; 16 binary and 4 analog inputs for status feedback, control, and alerting; frontside LEDs for fault status; CAN communication bus to control and display units AHD 502; the overall system is configured via an included software package;

Electronics unit in profile carrier housing, suitable for carrier rail mounting (TS32/35), for installation in the bow thruster's control cabinet.

Inputs	16 x optocoupler inputs (feedback, control, alarm)
Outputs	13 x switching outputs (control contactors)
Interfaces	1 x CAN (galvanically isolated), 1 x USB
Power supply	24 V DC (+30% / -25%)
Current consumption	500 mA @ 24 V DC
Dimensions (W x H x D)	216 mm x 126 mm x 64 mm
Degree of Protection	IP 20
Weight	approx. 0.8 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, BV

**AHD 502**

item-no. 12369

Electr. Bow Thruster Control – Control and Display Unit

AHD 502 is a compact display and control unit for electrically driven bow thrusters (control and display unit for AHD 501).

AHD 502 allows convenient operation of the bow thruster. Every power stage can be selected directly via command keys; direction and engine current are continuously displayed via the integrated 3.5" color display; further, all available data can be retrieved on various display pages; during an alarm, an optical and acoustic signal is given. As a standard, up to 3 control units are installed (bridge console, nock helms Bb and Stb). Optionally, a 4th unit can also be installed (see item-no. 14667).

Integrated emergency stop function; frontside LEDs for fault status; 3 switching outputs for power requirement, collective alarm, and horn; monitoring of power requirement (input for feedback); can be connected to external joystick (s. item-no. 14023); system communication via 3x CAN bus, thus simple installation and minimal cabling effort; integrated RS-422 port (IEC-61162-1) for activating a data voyage recorder.

Service menu for displaying internal system states (fault diagnosis), launch alarm memory and programming functions; local configuration of current thresholds and other important operational parameters can be performed directly on the device; diagnosis port for servicing and configuration via included PC software.

Inputs	1 x optocoupler (Power Ready)
Outputs	4 x switching outputs (emergency stop, Power-Request, common alarm, Horn)
Interfaces	3 x CAN (galvanically isolated), 1 x RS-422 (IEC-61162-1), 1 x serial
Power supply	24 V DC (+30% / -25%)
Current consumption	500 mA @ 24 V DC
Dimensions (W x H x D)	192 mm x 144 mm x 45 mm
Degree of Protection	IP 56 (front) IP 20 (rear)
Weight	approx. 1.0 kg
Operation temperature	-30 °C ... +70 °C
Storage temperature	-50 °C ... +85 °C
Approvals	GL, LR, BV

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