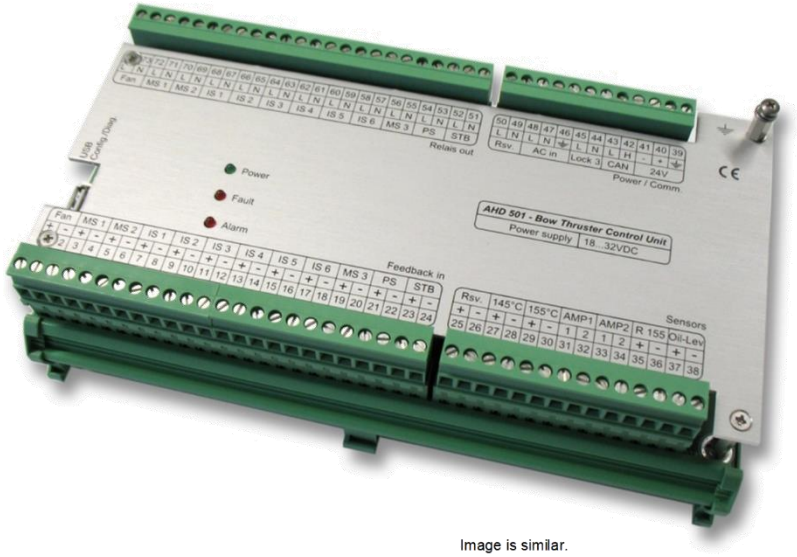
AHD 501, AHD 502
Bow Thruster Control Unit



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General

The bow thruster control units are designed for control and monitoring of a bow thruster with fixed propeller, driven by an three-phase asynchronous motor (slip-ring rotor).
The standard configuration of a bow thruster control consists of:

- one **central unit AHD 501**, installed in power section resp. in control cabinet of the bow thruster.
- up to three **control units AHD 502.** In standard configuration, these units are arranged in wheelhouse and in both wing control stands. All operation units are identical in construction.

All devices are interconnected by separate CAN communciation bus lines. The required end loads are already integrated. The CAN-bus arrangement for control units is performed in star-connection, which allows independently device identification within the system. The power supply is carried out in general from wheelhouse automation battery.
The demand of cabling is significantly minimized compared with a conventional control system.

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System features

Central unit AHD 501

- Microcontroller-based electronic module for cabinet or console installation
- Installation on profile rails TS32 or TS35 in power section resp. In control cabinet of the bow thruster
- CAN-communication bus to control unit AHD 502 (Master unit)
- Direct control of direction-, stage- und interstage contactors including feeedback monitoring
- Control of the 3 main stages (70%, 85%, 100%) and up to 6 interstages per effective direction
- Fan control and monitoring
- 2-phase monitoring of current (galvanically isolated) and winding temperatures of bow thruster motor
- Monitoring of oil level of bow thruster motor
- Check of contactor control voltage (circuit breaker)
- Controlable direct-locking of 100-percent-stage
- High rating of relays for contactor control, the demand of auxiliary contactors is only required in exceptional case
- 3 integrated LED indications for status messages:
  - Power: LED activtated with presence of power supply
  - Failure: Flashing of LED in case of communication faults , steady indication in case of processor fault
  - Alarm: Flashing of LED in case of new alarm, after acknowledgement of alarm, the LED turns to steady indication.
- USB-diagnostics-interface for service, configuration and status messages. All important parameter may be polled or configured at site.

Control unit AHD 502

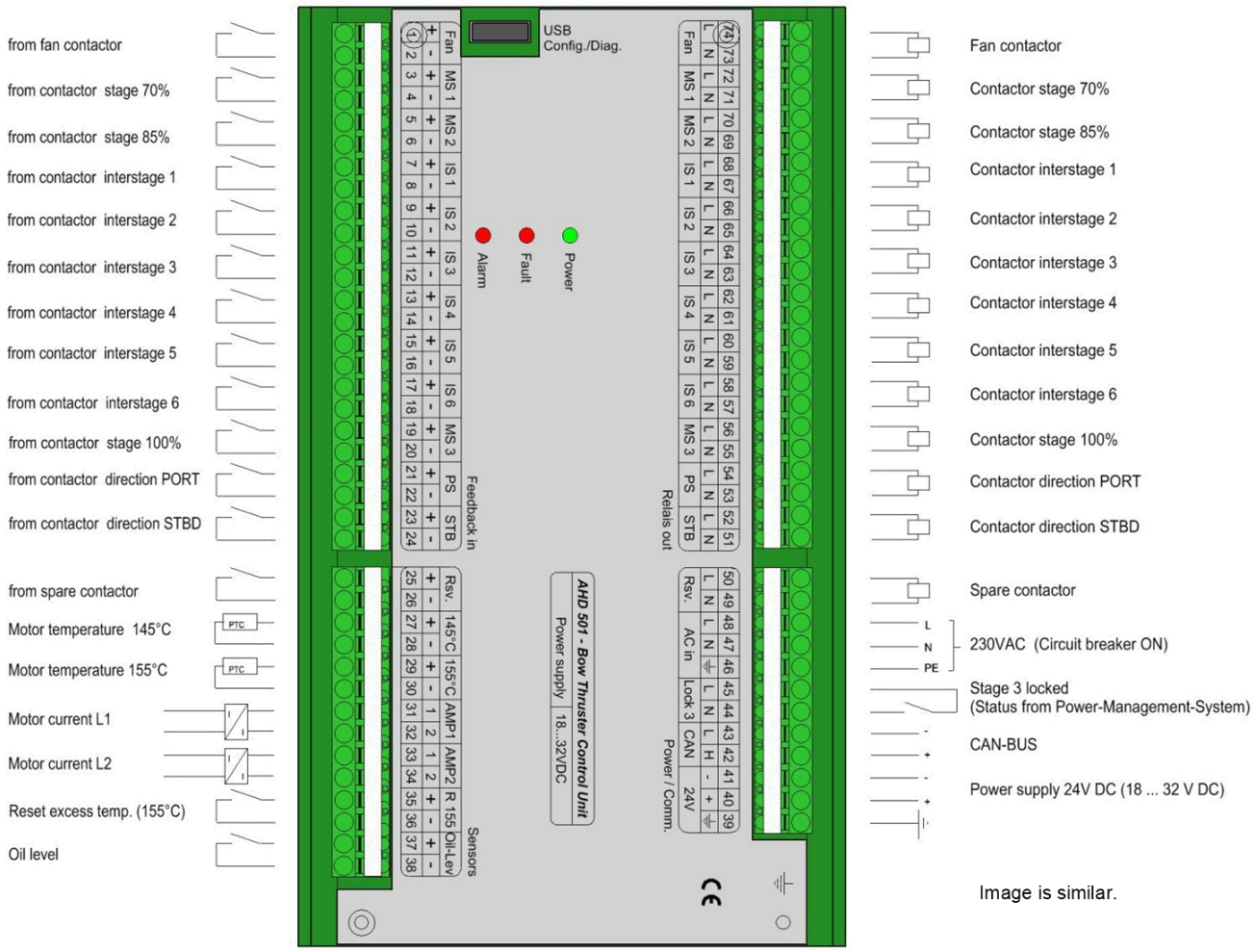
- Microcontroller-based control units for installation in wheelhouse control stand (Master control unit) and in wing control stands portside and starboardside (Slave control units)
- Unit front enclosure IP67
- Identical construction of units therefore easy spare part handling
- Compact design and minimized demand of cabling
- CAN bus communication (3 x CAN) to control units in wing control stands and to central unit in power section
- Simple operation of bow thruster, direct control of power stages by means of illuminated command push buttons
- 3,5" TFT-colour-display: Display of all operating conditions, actual motor current as well as actual alarms, system menu
- Automatic and adjustable illumination control
- Acoustical and visual signalisation of all alarms
- Potentialfree contact outputs for common alarm message and external horn
- Integrated service menu for display of internal system condition, call of alarm log and programming of current limits
- Power request to Power Management System by means of push „Power-Request" with feedback signal input „Power Ready" (controlled by Master unit)
- Integrated push button „Emergency Stop", emergency stop function even available in case of system breakdown by means of direct termination
- Optionally optocoupler input for connection of binary data station AHD-PS 15 e.g. for connection of external joystick-controller
- System menu for service, configuration and status messages. The most important parameters may be polled or configured at site.
- Integrated RS422-interface to Voyage Data Recorder, galvanically isolated. Data protocol acc. to. IEC-61162-1 standard

Technical Information

Central unit AHD 501

Technical data

• Mechanical data	
Dimension W x H x D	218 x 126 x 56 mm
Weight	0.5 kg
• Environmental data	
Operating temperature	-30°C … +70°C
Storage temperature	-50°C … +85°C
Enclosure	IP 20
• Electrical data	
Power supply	24 V DC (+30% / -25%)
Current consumption, max.	0.5 A
• Inputs	
2 x analog for recording of motor temperature	PTC-DIN44081 Triplet
2 x analog for recording of motor current, galvanically isolated	0 … 2000 mA (AC)
16 x binary for control, alarm and feedback signalization	Optocoupler
Safe distance to compass	Standard magnetic compass: 0.50 m Steering magnetic compass: 0.40 m
• Outputs	
11 x relay contact for power stage and fan contactor control	250 VAC/1500 VA (perm. contact load see documentation)
2 x relay contact for control of direction contactor PORT and STBD	250 VAC/4000 VA (permissible contact load see documentation)
• Interfaces	
Bus-communication	1 x CAN bus
Diagnostics/Configuration	1 x USB
Visual indications	
Indication “Power”	LED (green)
Indication “Alarm”	LED (red)
Indication “Fault”“	LED (red)
• Approvals	
Classification societies	-
Item number	12028



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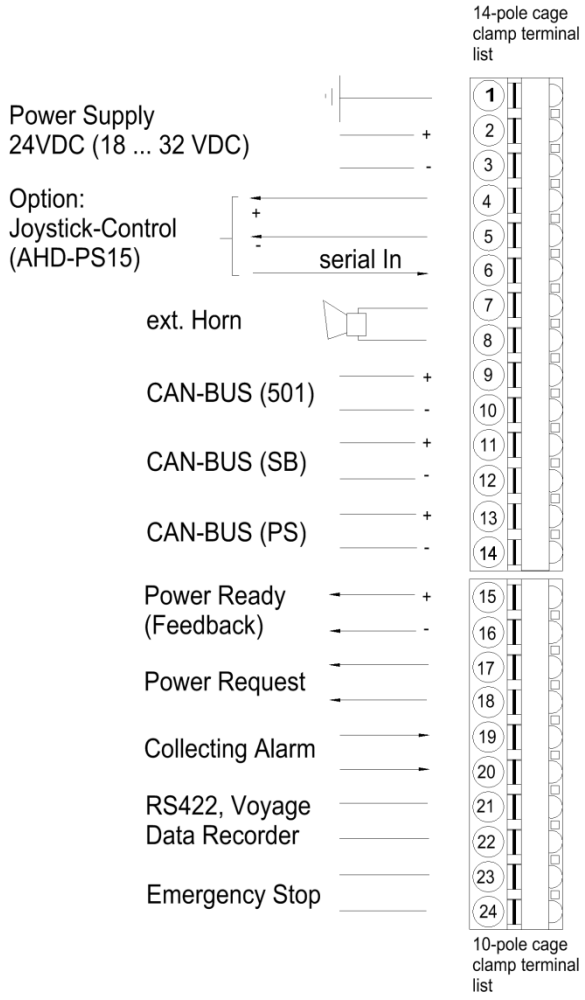
Control unit AHD 502:



Technical data

• Mechanical data	
Dimension W x H x D	192 x 144 x 45 mm
Weight	0.9 kg
• Environmental data	
Operating temperature	-25°C … +70°C
Storage temperature	-50°C … +85°C
Protection class	IP 66, front IP 20 rear
• Electrical data	
Power supply	24 V DC (+30% / -25 %)
Current consumption, max.	0.5 A
• Display	
3,5"-TFT-Display	320 x 240 pixel, transflective, with adjustable backlight
• Inputs	1 x serial input, (Option: control by external joystick via AHD-PS 15)
Safe distance to compass	Standard magnetic compass: 0.65 m Steering magnetic compass: 0.40 m
1 x binary for feedback signalization, Power Request (Power Ready)	Optocoupler
• Outputs	
1 x contact for emergency stop	Permissible contact load 40 V DC or 250 V AC /2 A
3 x relay contact for power request, common alarm and external horn	Permissible contact load 40 V DC/6 A
• Interfaces	
Bus communication	3 x CAN bus
Voyage Data Recorder (VDR), galvanically isolated, protocol acc. to IEC-61162-1	1 x RS422
• Button input	
7 x foil push buttons for command request for power stage with integrated feedback LED indication	
2 x foil push buttons for power request and emergency stop with integrated feedback LED indication	
5 x foil push buttons for acknowledgement, display and menu control	
• Approvals	
Classification societies	-