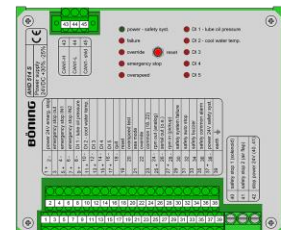
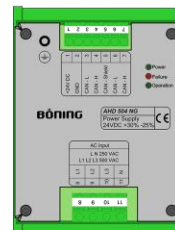
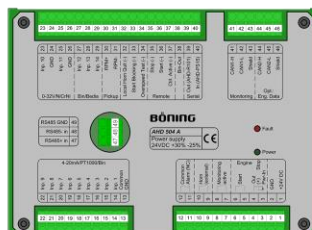
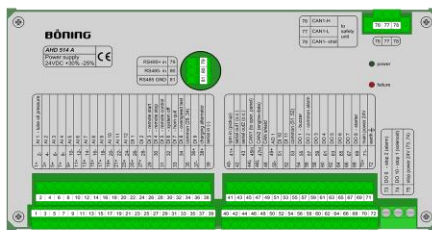
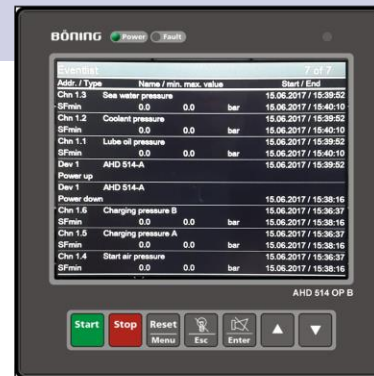


## AHD 504 / AHD 514

### Start / Stop, Alarm and Safety System, Monitoring of Main Engines, Auxiliary Engines and the Power Grid



- **Compact system for starting, stopping, and monitoring various engines**
- **Alarm and monitoring system designed for maritime use according to the classification societies' guidelines (ABS, BV, CRS, DNV GL, LR, RS)**
- **Additional grid monitoring device for monitoring 3-phase current and frequency**
- **Expandable to monitor for example gearboxes and propellers**

#### System Overview

The compact system AHD 504 / 514 has been designed and optimized for monitoring diesel engines. It provides all required functions for starting and stopping the engine as well as monitoring all required measuring points.

The device AHD 504 A / 514 A serves as the central unit and monitors the connected engine electronics. An appropriate alarm is triggered when an alarm limit is reached. The data are displayed on a compact 5.7" Color Display AHD 514 / AHD 514 OB B which also provides the start / stop function. The Safety System AHD 514 S monitors the redundant sensors required by the classification societies and activates a safety stop if an alarm occurs. An emergency stop system with separate power feed has also been integrated. The additional device AHD 504 NG allows the monitoring and measuring of the supply or generator voltage and frequency.

Every system AHD 504 / 514 can be extended with the binary data stations AHD-PS 15, AHD-PS 30, AHD-PS 47, the relay station AHD-R101, and the data station AHD-SAS 15.

All components have undergone a type approval procedure according to the regulations of the classification societies (for details see the respective device).

The devices communicate via a common designated CAN bus. This CAN bus can also be used to display the engine data on for example a Panel PC AHD 1215 F.

The second CAN interface of AHD 504 A or AHD 514 A can be used to receive and send engine data in the protocol J1939 and to connect various engine control units (MAN EDC, EMC, EMR, ECU).

The 56 most recent alarms can be displayed on AHD 514 OP. More logged events can be read with the configuration software DeviceConfig.

The individual components of AHD 504 and AHD 514 can be freely combined with one another for various applications (for example main engine control and monitoring, generator voltage monitoring, etc.).

Thus, an application specific and customized system is available for every application.

---

### **Alarm System AHD 504 A / AHD 514 A:**

The Alarm System AHD 504 A / AHD 514 A provides 14 analog and binary inputs, one engine speed input (pickup), three binary inputs, and six control inputs. All inputs can be monitored with configurable alarm limits, and they can trigger a corresponding alarm. Functions, such as Start, Stop, Start Blocking, and Overspeed Test, are activated at separate control inputs. Three relay outputs are used to control the stopping solenoid, the starter, and a signal horn. Error messages are forwarded to a higher-level alarm system at a collective alarm output. An additional relay contact is integrated for issuing the status message "Monitoring On." The device is mounted in a profile module housing. It is designed for panel mounting or cabinet installation on DIN rail TS32 / TS35.

The variant AHD 514 A COM is equipped with an additional COM module for Modbus connection (optional).

### **Safety System AHD 514 S:**

The Safety System AHD 514 S is a compact, microprocessor-controlled device in a profile module housing for panel mounting, switchboard installation, or switch box mounting on DIN rail TS32 / TS35. All safety functions for diesel engine monitoring systems required by the classification societies are provided.

The device includes two separate 24 V DC feeds for the emergency stop circuit and the safety system. The separate emergency stop inputs and outputs are monitored for wire break. The safety relevant (redundant) sensors are captured independently of the Alarm System AHD 504 A / AHD 514 A. AHD 514 S provides 2 binary inputs and one engine speed input (pickup) for monitoring the redundant sensors.

The wire break monitored inputs can trigger a safety stop when activated. Additional control inputs allow local reset and the activation of an override function. The device includes 2 stop outputs and among others, also permits direct control of a quick-action stop valve. Error messages are forwarded to a higher-level alarm system at a collective alarm output. Two additional relay contacts are provided for issuing the status messages "System Failure" and "Auto-Stop."

The device is mounted in a profile module housing. It is designed for panel mounting or cabinet installation on DIN rail TS32 / TS35.

### **Grid and Generator Monitoring AHD 504 NG:**

With this additionally available device, the voltage and frequency of the power supply system to be monitored can be measured. All 3 phases are captured separately. If predefined threshold values are exceeded, alarms are triggered. The device is mounted in a profile module housing designed for panel mounting or cabinet installation on DIN rail TS32 / TS35.

### **Display and Control Unit AHD 514 OP / AHD 514 OP B:**

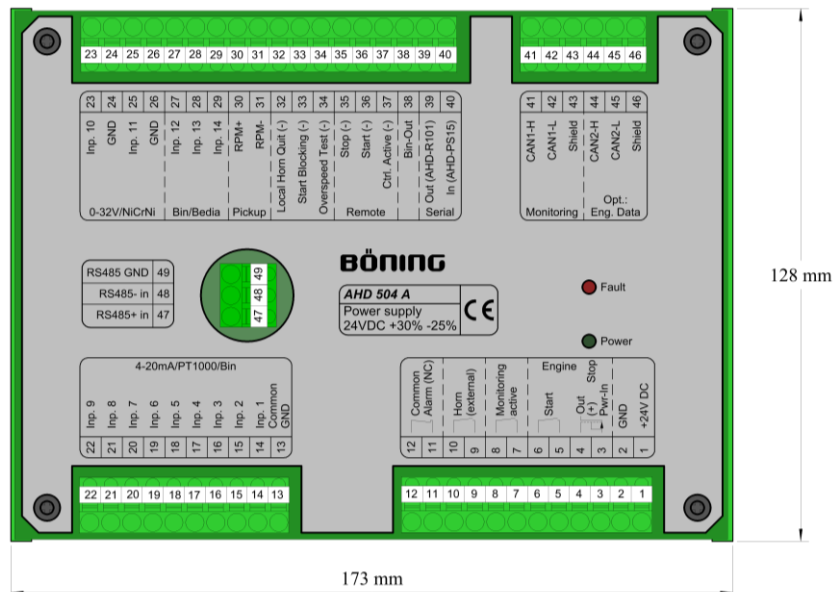
The Display and Control Units AHD 514 OP / AHD 514 OP B for panel or cabinet installation include a clearly readable 5.7" color display and integrated operating buttons. They are used for the display of all operating data and alarms in graphical and tabular format. With the built-in buttons, the diesel engine can be locally started or stopped. Other buttons allow page switching, alarm acknowledgement, or launching additional menu driven functions. For remote operation the optionally available Display and Control Unit AHD 514 OP B can be installed on the bridge.

To prevent unintentional engine starts, the displays provide a safety function:

To start the engine the corresponding button must be held down for at least 1 second.

---

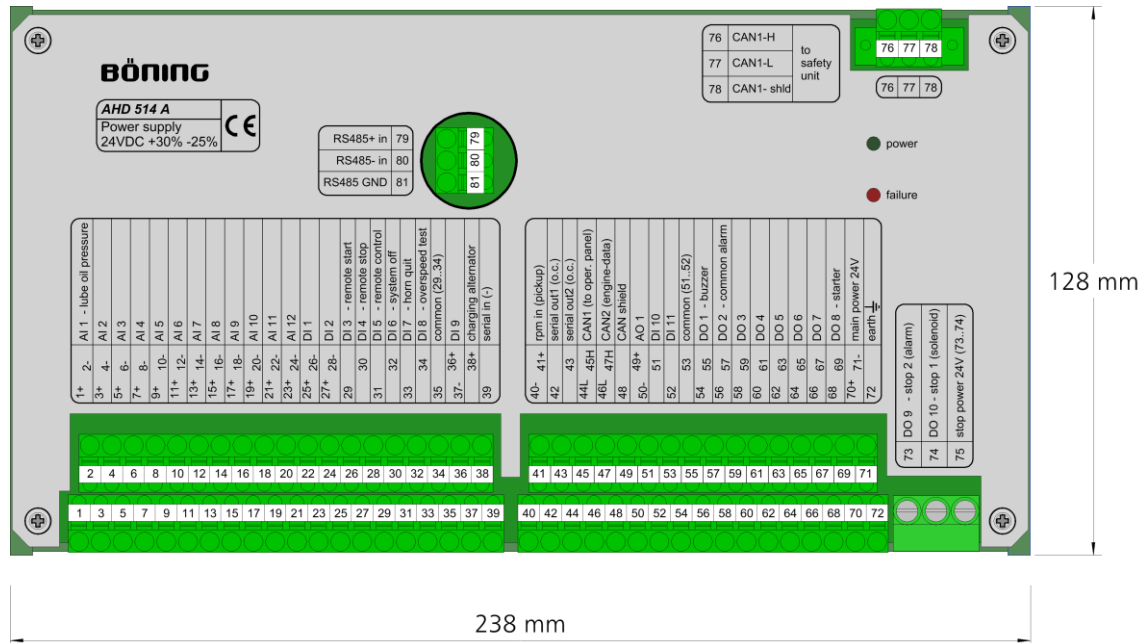
## AHD 504 A: View and Dimensions



### AHD 504 A: Technical Data

|                       |                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions W x H x D  | 173 mm x 128 mm x 55 mm (height including plug connector 65 mm)                                                                                                                                                                                                                                                                                                                                              |
| Weight                | Appr. 0.5 kg                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operating Temperature | -25°C ... +70°C                                                                                                                                                                                                                                                                                                                                                                                              |
| Storage Temperature   | -50°C ... +85°C                                                                                                                                                                                                                                                                                                                                                                                              |
| Protection Class      | IP 20                                                                                                                                                                                                                                                                                                                                                                                                        |
| Power Supply          | 24 V DC (+30% / -25%)                                                                                                                                                                                                                                                                                                                                                                                        |
| Current Consumption   | Max. 100 mA (24 V DC)                                                                                                                                                                                                                                                                                                                                                                                        |
| Inputs                | <p>20 inputs, relative to device's ground (GND):</p> <ul style="list-style-type: none"> <li>- 9 x analog (selection of 4–20 mA / PT1000/bin with jumper)</li> <li>- 2 x analog (selection of NiCrNi / 0-32 V with jumper)</li> <li>- 3 x binary (contact / Bedia with wire break monitoring)</li> <li>- 6 x binary (control inputs)</li> </ul> <p>1 x engine speed input (pickup, galvanically isolated)</p> |
| Outputs               | <p>1 x transistor 8 A (32 VDC), wire break monitored, short-circuit-proof (for solenoid or operation solenoid)</p> <p>4 x relay 3 A (32 V DC, potential-free)</p> <p>1 x transistor (32 V / 25 mA)</p> <p>2 x LED indicators (power, fault)</p>                                                                                                                                                              |
| Ports                 | <p>2 x CAN bus (communication/optional external engine bus J1939)</p> <p>1 x RS232 (9-pin Sub-D, diagnosis, firmware update)</p> <p>1 x serial input (optocoupler)</p> <p>1 x serial output (optocoupler)</p>                                                                                                                                                                                                |
| Installation Type     | Profile module housing, installation on DIN rail TS32 / TS35                                                                                                                                                                                                                                                                                                                                                 |
| Approvals             | DNV GL, RS (others on request)                                                                                                                                                                                                                                                                                                                                                                               |
| Item Number           | <p>AHD 504 A: 14639</p> <p>AHD 504 A COM: 14744</p>                                                                                                                                                                                                                                                                                                                                                          |

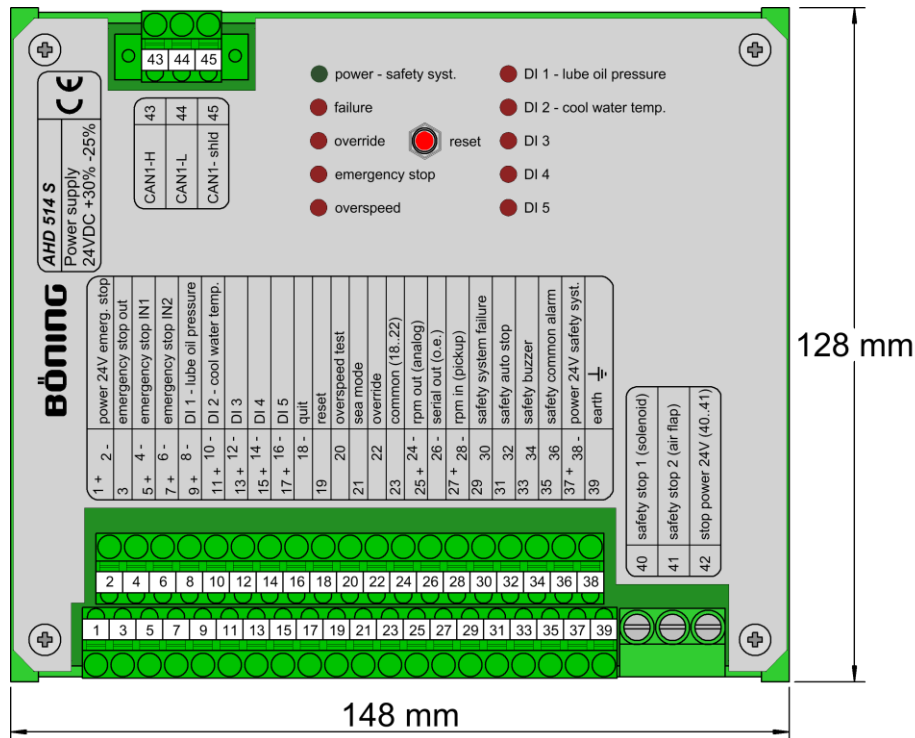
## AHD 514 A: View and Dimensions



## AHD 514 A: Technical Data

|                       |                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions W x H x D  | 238 mm x 128 mm x 77 mm                                                                                                                                                                                                                                                                                                          |
| Weight                | Appr. 0.70 kg                                                                                                                                                                                                                                                                                                                    |
| Operating Temperature | -30°C ... +70°C                                                                                                                                                                                                                                                                                                                  |
| Storage Temperature   | -50°C ... +85°C                                                                                                                                                                                                                                                                                                                  |
| Protection Class      | IP 20                                                                                                                                                                                                                                                                                                                            |
| Power Supply          | 24 V DC (+30% / -25%)                                                                                                                                                                                                                                                                                                            |
| Current Consumption   | Max. 225 mA (24 V DC)                                                                                                                                                                                                                                                                                                            |
| Inputs                | 6 x analog (4 – 20 mA) / binary<br>3 x analog (PT100/PT1000) / binary<br>3 x analog (4 – 20 mA) / (PT100 / PT1000) / binary<br>Analog inputs can be parameterized<br>1 x engine speed input, galvanically isolated<br>2 x binary, wire break monitored<br>8 x binary (control inputs)<br>2 x binary (electronic fuse monitoring) |
| Outputs               | 8 x relay 6 A (32 V DC), potential-free (control outputs, starter relay)<br>2 x transistor, 8 A (32 V DC), wire break monitored, short-circuit-proof for engine stop<br>1 x analog output (4–20 mA / 1–5 V / 2–10 V)<br>2 x LED indicators                                                                                       |
| Ports                 | 2 x CAN bus (communication / optional external engine bus J1939)<br>1 x RS232 (9-pin Sub-D, error diagnosis / log readout, firmware update)<br>1 x serial input (optocoupler)<br>2 x serial output (optocoupler)                                                                                                                 |
| Installation Type     | Profile module housing, installation on DIN rail TS32 / TS35                                                                                                                                                                                                                                                                     |
| Approvals             | ABS, BV, CRS, DNV GL, LR, RS                                                                                                                                                                                                                                                                                                     |
| Item Number           | AHD 514 A: 12972<br>AHD 514 A COM: 14527                                                                                                                                                                                                                                                                                         |

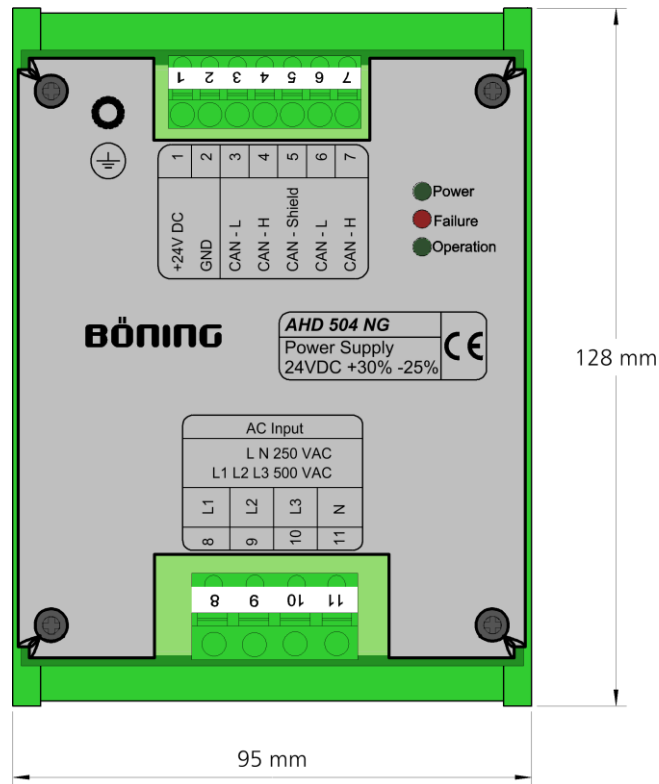
## AHD 514 S: View and Dimensions



### AHD 514 S: Technical Data

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions W x H x D      | 148 mm x 128 mm x 77 mm                                                                                                                                                                                                                                                                                                                                                                                                          |
| Weight                    | Appr. 0.50 kg                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Operating Temperature     | -30°C ... +70°C                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Storage Temperature       | -50°C ... +85°C                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection Class          | IP 20                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Power Supply              | Safety system: 24 V DC (+30% / -25%)<br>Emergency stop system: 24 V DC (+30% / -25%)                                                                                                                                                                                                                                                                                                                                             |
| Power/Current Consumption | Max. 98 mA (24 V DC)                                                                                                                                                                                                                                                                                                                                                                                                             |
| Inputs                    | 2 x binary, wire break monitored (emergency stop)<br>5 x binary, wire break monitored (stop criteria)<br>5 x binary (control inputs)<br>1 x engine speed input, galvanically isolated                                                                                                                                                                                                                                            |
| Outputs                   | 4 x relay 6 A (32 V DC), potential-free (for horn, collective alarm, etc.)<br>2 x transistor, 8 A (32 V DC), wire break monitored, short-circuit-proof (solenoid / operating solenoid, flapper valves; stop by safety system)<br>1 x transistor, 8 A (32 V DC), wire break monitored, short-circuit-proof (stop by emergency stop system)<br>1 x power output 4-20 mA (for external engine speed display)<br>10 x LED indicators |
| Ports                     | 1 x CAN bus (communication)<br>1 x serial output (optocoupler)                                                                                                                                                                                                                                                                                                                                                                   |
| Installation Type         | Profile module housing, installation on DIN Rail TS32 / TS35                                                                                                                                                                                                                                                                                                                                                                     |
| Approvals                 | ABS, BV, CRS, DNV GL, LR, RS                                                                                                                                                                                                                                                                                                                                                                                                     |
| Item Number               | 12973                                                                                                                                                                                                                                                                                                                                                                                                                            |

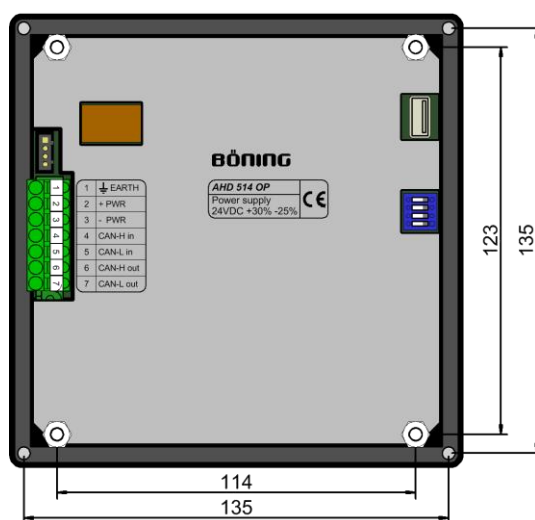
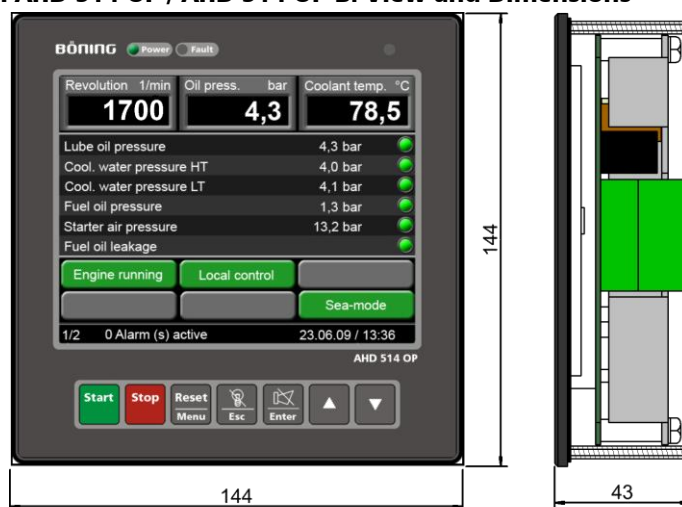
## AHD 504 NG: View and Dimensions



### AHD 504 NG: Technical Data

|                       |                                                                        |
|-----------------------|------------------------------------------------------------------------|
| Dimensions W x H x D  | 95 mm x 128 mm x 55 mm (height including plug connector 65 mm)         |
| Weight                | Appr. 0.25 kg                                                          |
| Operating Temperature | -25°C ... +70°C                                                        |
| Storage Temperature   | -50°C ... +85°C                                                        |
| Protection Class      | IP 20                                                                  |
| Power Supply          | 24 V DC (+30% / -25%)                                                  |
| Current Consumption   | Max. 37 mA (24 V DC)                                                   |
| Inputs                | 3 x analog (500 V AC, 50 Hz / 60 Hz) voltage and frequency measurement |
| Ports                 | 1 x CAN bus (communication)                                            |
| Installation Type     | Profile Module housing, installation on DIN Rail TS32 / TS35           |
| Approvals             | DNV GL, RS (others on request)                                         |
| Item Number           | 14377                                                                  |

## Display and Control Panel AHD 514 OP / AHD 514 OP B: View and Dimensions



### AHD 514 OP / AHD 514 OP B: Technical Data

|                       |                                          |
|-----------------------|------------------------------------------|
| Dimensions W x H x D  | 144 mm x 144 mm x 43 mm                  |
| Panel Cutout, W x H   | 131 mm x 131 mm                          |
| Weight                | Appr. 0.5 kg                             |
| Operating Temperature | -30°C ... +70°C                          |
| Storage Temperature   | -50°C ... +85°C                          |
| Protection Class      | IP 56 (front), IP 20 (rear)              |
| Power Supply          | 24 V DC (+30% / -25%)                    |
| Current Consumption   | Max. 200 mA (24 V DC)                    |
| Display               | 5.7" LCD color display                   |
| Viewable Screen Area  | 116 mm x 87 mm                           |
| Luminosity            | 500 cd/m <sup>2</sup>                    |
| Display Resolution    | 640 (h) x 480 (v) pixels                 |
| Color Depth           | 15 bit                                   |
| Ports                 | 1 x CAN bus (communication)              |
| Installation Type     | Housing for installation in panel cutout |
| Approvals             | ABS, BV, CRS, DNV GL, LR, RS             |
| Item Number           | AHD 514 OP: 12974<br>AHD 514 OP B: 14503 |

## Application Example

### Auxiliary Engine / Generator

- Engine Speed Control (Speed Up/Down)
- Communication with Various Engine Control Units
- Type Approved by ABS, BV, CRS, DNV GL, LR, RS

Display & Operation Unit  
AHD 514 OP B



Display & Operation Unit  
AHD 514 OP



CAN Bus Auxiliary Engine  
and Genset

Start/Stop System for Diesel  
Engines AHD 514 A



Modbus RTU  
Power Management System

Grid and Generator Capture  
AHD 504 NG



Safety System for Diesel  
Engines AHD 514 S



15" Panel PC  
AHD 1215 F



### Propulsion Engine System

- Dynamic Alarm Limits and History
- Optional Extensions:  
e.g. Gearbox, CCP
- Type Approved by ABS, BV, CRS, DNV GL, LR, RS

Display & Operation Unit  
AHD 514 OP B



Display & Operation Unit  
AHD 514 OP



CAN Bus Propulsion System

Modbus RTU  
External Ship Alarm System

Relay Station AHD-R101



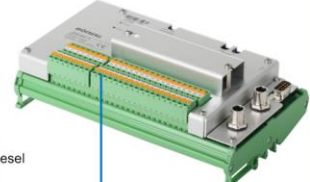
Safety System for Diesel  
Engines



External Engine Data  
CAN J 1939  
EDC, ECM, EMR, EMS, ECU



Start/Stop System for Diesel  
Engines AHD 514 A



Data Station  
AHD-SAS 15 M12