CERTIFICATE NUMBER
16-HG1565585-PDA

DATE
09 Nov 2016

ABS TECHNICAL OFFICE
Hamburg Engineering Department

CERTIFICATE OF
DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

HOPPE MARINE GMBH

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Processing Unit & Motion Sensors**

Model: **HOMIP 2; Hoppe Electronic Inclination; HOSIM 2; Passive Power over Ethernet (PoE) Module; Hoppe Linear Position Indicator**

This Product Design Assessment (PDA) Certificate 16-HG1565585-PDA, dated 09/Nov/2016 remains valid until 08/Nov/2021 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

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Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

U. Numirski

Ulf Numirski
Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

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Tier: 5 - Unit Certification Required

Product: **Processing Unit & Motion Sensors**
Model: **HOMIP 2; Hoppe Electronic Inclination; HOSIM 2; Passive Power over Ethernet (PoE) Module; Hoppe Linear Position Indicator**

Intended Service:
Programmable Logic Controller, Electronic Inclinometer & Ships Inertial Measuring System; Passive Power over Ethernet (PoE) and Linear Position Indicator for applications on ships.

Description:
The Processing Units & Motion Sensors are crafted for a wide range of applications on ships.

The Hoppe Electronic Inclinometer is capable of measuring the actual heel angle and determining the amplitude of the rolling oscillation of the ship over a range of ± 90°.

The Hoppe Ships Inertial Measuring System (HOSIM 2) is designed to enable an acceleration compensated determination of the actual roll and pitch movement and the associated period time.

The Hoppe Monitor Interact Process (HOMIP 2) is a powerful Soft-PLC, fulfilling the role as a communication and control master, with the added functionality of reporting.

The Hoppe Passive Power over Ethernet (PoE) is a transfer element, designed to inject (split) 24 VDC power at the spare wires from a non-terminated Ethernet cable.

The Hoppe Linear Position Indicator enables a contactless position indication of actuator movements based on reed-contacts.

Rating:
Hoppe Electronic Inclinometer
Processor: ARM Cortex A9 Dual Core, 800 MHz, 32 bit; 1 GB RAM
Root file system: FLASH 4 GB; Display
Power Supply: 24 VDC, 600 mA miniature fuse
Power Consumption: 12 W
Degree of Protection: IP44

HOSIM 2 (Hoppe Ships Inertial Measuring System)
Processor: ARM Cortex A9 Dual Core, 800 MHz, 32 bit; 1 GB RAM
Root file system: FLASH 4 GB
Interfaces: 1x RS422/RS485; 1x RS485; 1x Ethernet 100 Mbit, Auto-MDIX
Measurement Accuracy of HOSIM 2:
Linear acceleration: ± 0.005m/s² (standard deviation)
Angular velocity: ± 0.05°/s (standard deviation)
Roll angle/Pitch angle: ± 0.01° (static, standard deviation)
Power Supply: 24 VDC
Power Consumption: 10 W
Degree of Protection: IP68

HOMIP 2 (Hoppe Monitor Interact Process)
Power Supply & System Alarm: PHOENIX Contact, 4 PIN
Network: 2x Ethernet RJ45,
ETH0: 10/100 Mbit/s, ETH1: 10/100/1000 Mbit/s, MDIX;
USB: 1x Device & 2x Host, USB 2.0, up to 50 MB/s;
Card interface: SD / MMC, up to 25 MB/s;
Serial interfaces (optional): 2x RS422, 6x RS485, 2x CAN 500 Kbit; all interfaces isolated 250 VDC
Relays: K1 system alarm: 1A / 50 VDC resistive load (NC)

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Tier: 5 - Unit Certification Required

optional: K2 and/or K3 multi-purpose: 0.5 A / 125 VAC
Degree of Protection: IP44

Passive Power over Ethernet (PoE)
Communication: X1: 24 VDC Power
X2: Ethernet 10 Base-T & Ethernet 100 Base-TX
X3: Mixed Ethernet and power
Interfaces: 1x 8P8C (RJ45) connector for Ethernet 10 Base-T & 100 Base-TX
(only 4 data wires used; TXP, TXN, RXP, RXN);
1x FK-MCP 1,5/3-ST-3,81 (Phoenix Contact) connector for injected/splited 24 VDC voltage; max. wire diameter 1.5 mm^2;
1x insulation-displacement contact (IDC) for stranded 8-wire Ethernet cable; AWG 22-26 (0.14-0.34 mm^2);
1x screw terminal M4 for cable shield connection and strain relief; connected to PE
Power Supply: 24 VDC nominal for injected/splited voltage
Current: max. 1 A (0.5 A per conductor)

Hoppe Linear Position Indicator
Communication: Open/Close indication = high/low signal for digital outputs
Power Supply: 24 VDC nominal
Max. current: Default <10 mA
(depending on input resistance of connected digital input module)
Power input protection: Self-resetting fuse (Trigger: 300 mA)
Power polarity protection: Ensured by a diode (status LED only glows when polarity correct)
Position indication: Ensured by LED, for each signal status (open: green, close: yellow)
Connections: 1x 4-pin push-in spring connector for maximum conductor cross section of 1.5 mm^2
Degree of Protection: IP68

Service Restriction:
Unit Certification is required for this product in accordance with Section 4-1-1/Table 3 of the Steel Vessel Rules.

Comments:
The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:
Drawing No. 01, Data sheets - Processing Units & Motion Sensors, Revision: 0, Pages: 1
Drawing No. 02, Drawings - Processing Units & Motion Sensors, Revision: 0, Pages: 2
Drawing No. 03, General Information - Processing Units & Motion Sensors, Revision: 0, Pages: 3
Drawing No. 04, Quality Assurance - Processing Units & Motion Sensors, Revision: 0, Pages: 4
Drawing No. 05, Test Reports - Processing Units & Motion Sensors, Revision: 0, Pages: 5
Drawing No. 06, Manuals - Processing Units & Motion Sensors, Revision: 0, Pages: 1

Terms of Validity:
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Tier: 5 - Unit Certification Required

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STANDARDS

ABS Rules:
2016 Steel Vessel Rules: 1-1-4/7.7, 1-1-Appendix 3 and 4, 4-8-3/1.7/1.9/1.11/1.17, 4-9-8/13.1

National:
NA

International:
NA

Government:
NA

EUMED:
NA

OTHERS:
NA