CERTIFICATE NUMBER	26-0584944-PDA
EFFECTIVE DATE	03-Nov-2026
EXPIRY DATE	02-Nov-2031
ABS TECHNICAL OFFICE	Houston ESD

CERTIFICATE OF

Product Design Assessment

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

BASLER ELECTRIC COMPANY

located at

12570 STATE ROUTE 143, HIGHLAND, IL, United States, 62249

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:	**Controller, Digital Universal Controller**
Model:	**DGC-2020HD**
	AEM-2020
	CEM-2020
	VRM-2020
Endorsements:	
Tier:	**2 - PDA Issued**

This Product Design Assessment (PDA) Certificate remains valid until 02/Nov/2031 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Soheni Haque

Soheni Haque, Sr. Managing Principal Engineer

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 ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

Sensitivity: Internal & Restricted

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Tier: 2 - PDA Issued

Product: **Controller, Digital Universal Controller**
Model: **DGC-2020HD**
AEM-2020
CEM-2020
VRM-2020
Endorsements:

Intended Service:
Marine and Offshore Applications: Digital Control Systems for control of Diesel Engines and Generators on Ships and Offshore facilities.

Description:
DGC-2020HD: Microprocessor-based controller with integrated programmable logic and load sharing capabilities, designed for genset control, protection and metering for mains fail, paralleled units and systems with multiple buses. There are optional variations DGC-2020HD DIN Rail and DGC-2020HD Panel Mount.

AEM-2020: Analog Expansion Module fitted with 8 analog inputs, 8 resistance temperature device (RTD) inputs, 2 type k thermocouple inputs, 4 analog outputs configurable for 4 to 20 mA and 0 to 10 Vdc ranges, Controller Area Network (CAN) communication protocol, compatible with DGC-2020, DGC-202HD, DECS-250, DECS-250N and IEM-2020.

CEM-2020: Contact Expansion Module fitted with 10 dry contact inputs, 24 contact outputs, programmable, CAN communication protocol, compatible with DGC-2020ES, DGC-202, DGC-202HD, DECS-250, DECS-250N and IEM-2020

VRM-2020: Voltage Regulation Module - a remote module which communicates with the DGC-2020HD to provides excitation to the field of a brushless exciter for automatic voltage regulation.

Rating:
DGC-2020HD:
Voltage: Nominal - 12 VDC or 24 VDC, Range: 6 VDC to 32 VDC;
Power Consumption: Normal Operation - 18.1 W, Maximum - 25 W, Sleep - 12.7 W;
Enclosure Rating: IP 56 (Front Panel);
Environmental: Operating Temperature: -40°C to 70°C (-40°F to 158°F); the color touch screen maintains operation from -20°C to 70°C (-4°F to 158 °F);

VRM-2020:
Operating Power: Configuration: Single-phase, PMG only, Voltage Range: 150 to 300 Vac, Frequency Range: 50 to 300 Hz
Control Power: Nominal: 12 or 24 Vdc, Range 6 to 32 Vdc
Field Output: Continuous Rating: 63 Vdc, 3.5 Adc, Forcing Rating: Up to 120 Vdc at 7.5 Adc for 10 seconds
Voltage Regulation Accuracy: ±0.25% from no load to full load
Environmental: Operating Temperature: -40°C to 70°C (-40°F to 158°F), Storage: -40°C to 85°C (-40°F to 185°F)
Shock: 15 G in 3 perpendicular planes; Vibration: 3 to 25 Hz: 1.6 mm peak amplitude; 25 to 2000 Hz: 5 G.

AEM 2020:
Power Supply: Normal 12 to 24 Vdc, Range: 8 to 32 Vdc, 5.1 W.
Analog Inputs: 8; Voltage: 0 to 10 Vdc, Burden: 9.65 k minimum; Current: 4 to 20 mAdc, Burden: 470 maximum
RTD Inputs: 8, Rating: 100 platinum or 10 copper, Setting Range: -50°C to 250°C / (-58°F to 482°F)
Thermocouple Inputs: 2, Rating: Type K, Setting Range: 0 to 1378°C (0 to 2507°F)
Analog Outputs: Voltage: 0 to 10 Vdc, Current: 4 to 20 mAdc
CAN Bus: Differential Bus Voltage: 1.5 to 3 Vdc, Max. Voltage: -32 to +32 Vdc, Communication Rate: 250 kB/s

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Environmental: Operating Temperature: -40°C to 70°C (-40°F to 158°F), Storage: -40°C to 85°C (-40°F to 185°F)
Shock: 15 G in 3 perpendicular planes; Vibration: 5 to 29 Hz: 1.5 G peak for 5 min.; 29 to 52 Hz: 0.036 in. double amplitude for 2.5 minutes, 52 to 500 Hz: 5 G peak for 7.5 min.

CEM 2020:
Power Supply: Normal 12 to 24 Vdc, Range: 8 to 32 Vdc, 14 W.
Contact Inputs: 10 dry contacts, programmable
Contact Outputs: No. 1 through 12: 1 Adc, 30 Vdc Form C, gold contacts; No. 13 through 24: 4 Adc, 30 Vdc, Form C
CAN Bus: Differential Bus Voltage: 1.5 to 3 Vdc, Max. Voltage: -32 to +32 Vdc, Communication Rate: 250 kB/s
Environmental: Operating Temperature: -40°C to 70°C (-40°F to 158°F), Storage: -40°C to 85°C (-40°F to 185°F)
Shock: 15 G in 3 perpendicular planes; Vibration: 5 to 29 Hz: 1.5 G peak for 5 min.; 29 to 52 Hz: 0.036 in. double amplitude for 2.5 minutes, 52 to 500 Hz: 5 G peak for 7.5 min.

Service Restriction:
1. Unit certification is not required for this product. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
2. Where the system is installed in a classified area, all components in hazardous area must be certified and installed according to approved procedures

Comments:
1. The manufacturer has provided a declaration about the control of, or the lack of, asbestos in this product.
2. Prototype testing performed as per ABS Marine Vessel Rules 4-9-9/Table 1 except test # 2, 10, and 16. Tests for hardware only. Each configuration and external connection arrangement is to be specifically approved. When incorporated in a system of Category I, II, or III in accordance with 4-9-3/7.1 and 4-9-3/Table 1 of the ABS Marine Vessel Rules, the documentation detailed in 4-9-3/Table 2 is to be submitted to ABS or to be available for review by ABS as applicable.
3. The specific functional and operational arrangements are to be specifically approved in connection with the design approval of a particular generator type/arrangement.
4. The equipment (voltage regulator) in the system for each installation is to be tested for verification of meeting the functional requirements defined in 4-8-3/3.13.2 of the Marine Vessel Rules.
5. Arrangements for electric propulsion generators are to be such that propulsion can be maintained in case of failure of an excitation system or failure of a power supply for an excitation system according to 4-8-5/5.5.1(d) of the ABS Marine Vessel Rules.
6. When excitation control systems are used in propulsion systems, they are to be inspected when finished, and dielectric strength tests and insulation resistance measurements are to be made on the various circuits in the presence of the Surveyor, preferably at the plant of the manufacturer.
7. When the DGC-2020HD and associated accessories are installed in the generators, the unit is to be tested in the generators' factory as per 4-8-3/Table 3 for generators >= 100 KW.
8. For equipment used for essential and emergency services on vessels not receiving notations ACC, ACCU, or ABCU, or facilities without AMCC or AMCCU, all installations are to be functionally tested in accordance with 4-9-9/Table 2 of ABS Marine Vessel Rules to the satisfaction of the surveyor on board and during Sea trials.

Notes/Drawing/Documentation:
Supporting Data from Previous task WO00T2094227;
Drawing No. 9469300785, IACS E10 Radiated Immunity Test Report, Pages: 29, Dated: 11 August 2021
Drawing No. 9469300786, IACS E10 Radiated Emissions Report, Pages: 48, Dated: 10 August 2021
Drawing No. 9503800782_DLS EMC, 9503800782_DLS EMC, Pages: 44, Dated: 08 July 2016
Drawing No. 9503800783_DLS EMC, 9503800783_DLS EMC, Pages: 32, Dated: 08 July 2016
Drawing No. 9503800784_DLS EMC, 9503800784_DLS EMC, Pages: 21, Dated: 08 July 2016
Drawing No. ABS Witness Tests Cert (Report Number: CH3149084), Page: 1, Dated: 16 June 2016
Drawing No. Dielectric Voltage Withstand and IACS High Voltage Test Signed, Pages: 15, Dated: 13 July 2016
Drawing No. IACS Cold_VRM-2020, IACS Cold_VRM-2020, Pages: 11, Dated: 08 August 2016
Drawing No. IACS Damp Heat_VRM-2020, IACS Damp Heat_VRM-2020, Pages: 12, Dated: 08 August 2016

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Drawing No. IACS Dry Heat_VRM-2020, IACS Dry Heat_VRM-2020, Pages: 12, Dated: 08 August 2016

Identifying Data from current task WO0741520;
Drawing No. GAP, DGC-2020HD Maritime Gap Analysis for EMC, Revision: 0,
Test Report No. 2601863-01 dated 16 September 2026, DGC-2020HD Radiated Immunity and Emissions Report, Revision: A

Terms of Validity:
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STANDARDS

ABS Rules:
2026 Rules for Conditions of Classification, 1A-1-4/7.7, 1A-1-A3, and 1A-1-A4, which covers the following:
2026 Marine Vessel Rules: 4-8-3/1.7, 1.11.1, 1.17.1, 4-8-3/3.13.2, 4-8-3/Table 3, 4-8-4/27.1, 4-8-5/5.5.1, 4-9-3/7.1, 4-9-3/Table 2, 4-9-8/13.1, 4-9-9/Table 1, 4-9-9/Table 2;

2026 Rules for Conditions of Classification, Offshore Units, and Structures 1B-1-4/9.7, 1B-1-A2, and 1B-1-A3, which covers the following:
2026 Offshore Units Rules: 4-3-1/11, 4-3-1/15, 4-3-1/17.1, 4-3-3/9.1.2;

National:
N/A

International:
IEC 60068-2-1: 2025: Environmental Testing Part 2-1: Tests – Test A: Cold
IEC 60068-2-2: 2025: Environmental Testing Part 2-2: Tests – Test B: Dry Heat
IEC 60068-2-6: 2007: Environmental Testing Part 2-6: Tests – Test Fc: Vibration (sinusoidal)
IEC 60068-2-30: 2025: Environmental Testing Part 1-30 Tests – Test Db; Damp Heat, cyclic (12 h + 12 h cycle)
IEC 61000-6-2: 2016: Electromagnetic Compatibility (EMC): Generic Standards Immunity for Industrial Environments

Government:
N/A

EUMED:
N/A

OTHERS:
N/A