CERTIFICATE NUMBER	21-2070052-PDA
EFFECTIVE DATE	25 January 2021
EXPIRATION DATE	24 January 2026
ABS TECHNICAL OFFICE	Singapore Engineering Office

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 **Controllers**

Model **DECS-150, DECS-250 and DECS-250N**

This Product Design Assessment (PDA) Certificate remains valid until 24 January 2026 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

K.S. Manoraaju

Manoraaju, 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 ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement

BASLER ELECTRIC COMPANY
12570 STATE ROUTE 143
HIGHLAND IL
United States 62249
Telephone: 618-654-2341
Fax: 618-654-2351
Email: info@basler.com
Web: basler.com

Tier: 2 - PDA Issued

Product: **Controllers**
Model: **DECS-150, DECS-250 and DECS-250N**
Endorsements:

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

Description:
Digital Excitation Control System for controlling the output of rotary excited synchronous generators.
The DECS-150 is a microprocessor based digital excitation control system to control the output of brushless excited AC synchronous generators, provides voltage, VAR and Power Factor regulation
The DECS-250 is a digital excitation control system to control the output of brushless excited AC synchronous generators, provides voltage, VAR and Power Factor regulation along with generator protection with optional power system stabilizer.
The DECS-250N is a digital excitation control system with negative forcing to control the output of brushless excited AC synchronous generators, provides voltage, VAR and Power Factor regulation along with generator protection with optional power system stabilizer. A rectifier bridge fitted into DECS-250N provides high positive and negative field forcing for improving system response characteristics.

Rating:
DECS-150:
Nominal Input Voltage: 120Vac, 125Vdc; Full Load Continuous Voltage: 63Vdc
Nominal Input Voltage: 240Vac, 250Vdc; Full Load Continuous Voltage: 125Vdc
Environmental: Operating Temperature: -40°C to 55°C (-40°F to 131°F), Shock: 30 G in 3 perpendicular planes, Vibration: 5 G for 3 hours from 18 to 2,000 Hz
IP54 rating when rear-mounted USB option is selected

DECS-250
Control Power: 24/48 Vdc, 120Vac/125Vdc (50/60Hz);
Operating power: 56-70 Vac/32 Vdc, 100-139 Vac/125Vdc, 190-277Vac/250Vdc (50-500Hz); Generator and Bus Voltage Sensing: 1 or 3 phase;
Voltage Range: 120Vac, 240Vac, 480Vac, 600Vac, (50/60Hz);
Excitation Power Voltage: 32Vdc, 63Vdc, 125Vdc.
Environmental: Operating Temperature: -40°C to 70°C (-40°F to 158°F), Shock: 15 G in 3 perpendicular planes, Vibration: 5 G for 3 perpendicular planes from 18 to 2,000 Hz

DESC-250N:
Control Power: 24/48 Vdc, 120Vac/125Vdc (50/60Hz);
Operating power: 100-139 Vac, 190-277Vac, 380-528Vac (50/60 or 61-420Hz); Generator and Bus Voltage Sensing: 1 or 3 phase;
Voltage Range: 120Vac, 240Vac, 480Vac, 600Vac, (50/60Hz);
Excitation Power Voltage: 32Vdc, 63Vdc, 125Vdc, 250Vdc.
Environmental: Operating Temperature: -40°C to 60°C (-40°F to 140°F), Shock: 15 G in 3 perpendicular planes, Vibration: 5 G for 3 perpendicular planes from 3 to 2,000 Hz

Service Restriction:
Unit Certification is not required for this product.
If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:
Duplicated PDA resides with Basler Electric Co. - TAYLOR.

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1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2) The specific functional and operational arrangements are to be specifically approved in connection with the design approval of particular generator type.
3) 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 ABS Marine Vessels Rules.
4) 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 Vessels Rules.
5) When excitation control systems are used in propulsion systems are to be inspected when finished and dielectric strength tests and insulation resistance measurements made on the various circuits in the presence of the Surveyor, preferably at the plant of manufacturer.
6) When the DECS-250 or DECS-250N are installed in the generators, the unit is to be tested in generators' factory as per 4-8-3/Table 3 of the ABS Marine Vessels Rules, for generators >= 100 KW.
7) Approval is 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 Vessels 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.
8) For equipment used for essential and emergency services on vessels not receiving notations ACC, ACCU, or ABCU, facilities without AMCC or AMCCU, all installations are to be functionally tested in accordance with ABS Marine vessel Rules 4-9-9 Table 2 to the satisfaction of the surveyor on board and during sea trial.

Notes/Drawing/Documentation:
Document No. CoC_DGC-2020HD 2013-05-10, Pages: 1
Document No. CoFC_26323791, Pages: 1
Assembly Drawings & Specification
Drawing No. 9492600400, DESC-150 Assembly, Revision -, Pages: 3
Drawing No. 9492601910, DECS-150 Schematic, Revision B, Pages: 5
Drawing No. 9440300401_Rev. B, DECS-250, Final Assy. Drawing; Pages: 5
Drawing No. 9440500400_Rev. C, DECS-250N, Final Assy. Drawing; Pages: 5
Document No: SZT-1 (8-15) DECS-150 Digital Excitation Control system Specification sheet; Pages: 2

Test Reports
Document No. 9492600094 IACS E10 Maritime Test Report for Tests 1, 2, 5, 6, 7, 9, 11, Test Facility: Basler Electric Co. Revision A, dated 27 April to 5 May 2015, Pages: 47.
Document No. 9492600095 IACS E10 Maritime Test Report for Tests 1, 2, 3, 4a, 9, 10, Test Facility: Basler Electric Co. Revision A, dated 27 to 30 April, Pages: 35.
Document No. 9492600780 Radiated Immunity Test Report of DECS-150, IEC 61000-4-3, Test Facility: Basler Electric Co., dated 11 December 2011 Pages: 30.
Document No. 9492600782 IACS E10 Emissions Report of DECS-150, IEC 60533, Test Facility: Basler Electric Co., dated 14 to 16 January 2015, Pages: 46.
Document No. 9492600783 IACS E10 Immunity Report of DECS-150, Test Facility: Basler Electric Co., dated 27 to 29 April & 15 June 2015, Pages: 76.
Document No. 944030078 IACS E10 Immunity Report of DECS-250, Test Facility: DLS Electronic Systems, dated 3 December 2020, Pages: 38.
Document No. 9440300789 IACS E10 Emission Report of DECS-250, Test Facility: DLS Electronic Systems, dated 3 & 4 November 2020, Pages: 51.
Document No: 94403 Damp Heat Test Power System Products, Test Facility: Basler Electric company, dated 20 December 2020, Pages:42.

Terms of Validity:
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STANDARDS

ABS Rules:
Rules for Conditions of Classification (2021) – Marine Vessels 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:
2021 Rules for Building and Classing Marine Vessels: 4-9-9/3, 4-9-9/13 & 4-9-9/Table 1

National:
NA

International:
IEC 60533 Ed. 3.0 en:2015;
IEC 61000-4-2 Ed. 2.0 b:2008;
IEC 61000-4-4 Ed. 3.0 b:2012;
IEC 61000-4-5 Ed. 3.1 b:2017;
IEC 61000 -4-6 Ed. 4.0 b:2013;
IEC 61000-4-11 Ed. 3.0 b:2020;
IEC 61000-4-16 Ed. 2.0 b: 2015;
IACS UR E10 Test Specification for type approval – Rev 7 Oct 2018

Government:
NA

EUMED:
NA

OTHERS:
NA