



Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product. This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 13-MAR-2024. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Product Name: Brake, Stearns Spring-Set Disc
Model Name(s): Series: 81000; 82000; 82300; 86000

Presented to:
REXNORD INDUSTRIES, LLC STEARNS DIVISION
5150 S. INTERNATIONAL DR.
WI 53110
United States

Intended Service:	Offshore Application - Electric Motor Brakes for Mobile Offshore Drilling Unit Jack-Up Apparatus.
Description:	Solenoid Actuated Brakes (SAB) - Spring Set, Self-Adjusting Design, Electrically Released Disc Brakes.
Tier:	5
Ratings:	Brakes holding capacity ratings as well as other technical specifications for each model are indicated in the attached list. Coil Insulation: Standard Class B, Optional Class H.
Service Restrictions:	- Unit Certification is required for this product. - Series 82300 are UL Listed and CSA Certified for use in Division 1, Class I, Groups C and D, and Division 1, Class II, Groups E, F and G Hazardous (Classified) Locations. - Series 82000 are not to be used in Hazardous (Classified) Locations. - Design Ambient Temperature Range: -30°C (-22 °F) through 55 °C (131°F). - Operation at ambient temperatures above 22°C (72°F) requires derating of the thermal capacity rating. See attached Derating Thermal Capacity Chart.
Comments:	1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. 2) The brakes are to be operated in line with manufacturer's recommendations/manuals. 3) Brakes are to be designed to engage automatically in the event of failure of power supply to the motor (fail-safe)

type). The brake holding capacity is to be at least equal to 120% of the maximum required brake torque associated with the maximum rated load applied to the climbing pinion from all loading conditions specified in ABS 2019 MOU/MODU Rules Section 6-1-9/11. 4) Brake fitness shall be determined by the required torque rating to counteract the maximum rated load, and the method in which the brake is engaged. 5) Holding mechanisms on self-elevating units are to be designed with sufficient redundancy so that upon failure of any one component, the system will prevent an uncontrolled descent of the unit. Approved procedures are to be provided to allow emergency raising or lowering of the unit after failure in the case the unit is holding in an unsafe position. 6) A Failure Modes and Effects Analysis (FMEA) for the complete jacking system including the electric motor brakes is to be carried out as per 6-1-9/7 of the MOU/MODU Rules and submitted for ABS Review. 7) During construction or after installation, performance test may be required to the satisfaction of the attending Surveyor as applicable. 8) For low temperature applications, components in main load path are to meet the Charpy V-Notch (CVN) impact requirements specified in 2019 ABS MOU/MODU Rules, Section 6-1-9/Table 1. 9) Components in the direct load path are to be constructed of steel, or other acceptable ductile materials with an elongation not less than 12%. Subject to agreement, high strength case hardened gears made to recognized standards, may have a minimum elongation value of 8% as per 2019 ABS MOU/MODU Rules, Section 6-1-9/9. 10) DuPont Zytel 80G33HS1L-NC010 plunger guide is acceptable to be used in solenoid assembly for brakes having a -30°C to +55°C temperature range. 11) Tests and inspections on materials associated with the jacking system are to be performed to the satisfaction of the Surveyor. All material test data and inspection results shall be made available to the Surveyor to review at their discretion.

Notes / Documentation:

Dwg. 1-086-002-3MC, Rev. 1, "Outline Drawing IP56 Enclosure w - Conduit Box"; Supporting Documentation (previous task); Dwg. 1-081-001-2D, Rev. C, "Outline Dwg, Standard Open Enclosure"; Dwg. 1-081-002-2D, Rev. D, "Outline Dwg, IP54 Enclosure"; Dwg. 1-081-001-3D, Rev. A, "Outline Dwg, Aluminum Housing, IP23"; Dwg. 1-081-002-3D, Rev. A, "Outline Dwg, Aluminum Housing, IP54" Dwg. 1-082-002-2D, Rev. E, "Outline Dwg, DTWP Enclosure"; Dwg. 1-082-002-2MC, Rev. G, "Outline Dwg, IP56/57 Enclosure, w/Conduit Junction Box"; Dwg. 1-082-002-IP56, Rev. A, "Outline Dwg, Side Manual Release O-Ring Gaskets & Close Coupled"; Dwg. 1-082-002-BMZD, Rev. C, "Outline Dwg, Side Manual Release IP56"; Dwg. 1-082-001-3D, Rev. B, "Outline Dwg, Aluminum Housing (NEMA 2)"; Dwg. 1-082-002-3MC-1, Rev. G, "Outline Dwg, NEMA 4 Enclosure w/Conduit Box"; Dwg. 1-082-002-3MC-2, Rev. F, "Outline Dwg, IP56 Enclosure w/Conduit Box - US Mechatronics"; Dwg. 1-082-002-3MC-4, Rev. B, "Outline Dwg, NEMA 4 Enclosure w/Conduit Box"; Dwg. 1-082-002-3MC-5, Rev. C, "Outline Dwg, NEMA 4 Enclosure w/Conduit Box"; Dwg. 1-082-052-03-050, Rev. A, "Outline Dwg, IP56 Enclosure w/Conduit Box"; Dwg. 1-082-052-03-051, Rev. A, "Outline Dwg, IP56 Enclosure w/Conduit Box"; Dwg. 1-082-052-03-053, Rev. A, "Outline Dwg, IP56 Enclosure w/Conduit Box"; Dwg. 1-082-052-03-054, Rev. A, "Outline Dwg, IP56 Enclosure w/Conduit Box"; Dwg. 1-082-304-D "Outline Dwg, Motor Mounted"; Dwg. 1-082-304-2D "Outline Dwg, Fan Guard Mounted"; Dwg. 1-082-305-D "Outline Dwg, Motor Mounted"; Dwg. 1-086-001-D, Rev. A, "Outline Dwg, Std Open Enclosure"; Dwg. 1-086-002-D, Rev. A, "Outline Dwg, 86,000-2 Series, Dust-Tight, Waterproof Enclosure"; - The test report of DuPont Zytel Plunger Guides. - Product guide and properties of DuPont Zytel 80G33HS1L-NC010. - UL File E14893; - CSA File LR9584; - CSA File LR6254

Term of Validity:

This Product Design Assessment (PDA) Certificate 19-HS1832443-PDA, dated 14/Mar/2019 remains valid until 13/Mar/2024 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. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

ABS Rules:

Rules for Conditions of Classification, Part 1 (2019): 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following: 2019 Rules for Building and Classing Steel Vessels: 4-8-3/1.11, 4-8-3/13.3.2 2019 Rules for Building and Classing Marine Vessels:

4-8-3/1.11, 4-8-3/13.3.2 Rules for Conditions of Classification, Part 1 (2019) Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following: 2019 Rules for Building and Classing Mobile Offshore Drilling Units: 4-1-1, 4-3-1, 4-3-3/1.5, 4-3-3/9, 4-3-6, 6-1-9 2019 Rules for Building and Classing Mobile Offshore Units: 4-1-1, 4-3-1, 4-3-3/1.5, 4-3-3/9, 4-3-6, 6-1-9

National Standards:
International Standards:
Government Authority:
EUMED:
Others:

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA	19-HS1832443-PDA	15-MAR-2019	13-MAR-2024



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.