



CERTIFICATE NUMBER
19-HS1854283-PDA

DATE
31 May 2019

ABS TECHNICAL OFFICE
Houston ESD - Offshore
Equipment

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of
HAMMOND POWER SOLUTIONS INC.

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: **Transformer & Reactor**

Model: **Types J, K, KN; G, F, FN; JR, KR, KNR; GR, FR, FNR; QT, HZQT; Q, HZQ; CV, CVHW; E & 3AH**

This Product Design Assessment (PDA) Certificate 19-HS1854283-PDA, dated 31/May/2019 remains valid until 30/May/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.

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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
Dustin De Los Santos
Dustin De Los Santos
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).

HAMMOND POWER SOLUTIONS INC.

595 SOUTHGATE DRIVE

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Tier: 5 - Unit Certification Required

Product: Transformer & Reactor

Model: Types J, K, KN; G, F, FN; JR, KR, KNR; GR, FR, FNR; QT, HZQT; Q, HZQ; CV, CVHW; E & 3AH

Intended Service:

Marine and Offshore Applications - intended for use to increase or decrease the alternative voltages in electric power distribution systems on board ships and offshore platforms.

Description:

Transformer is a static electrical device that transfer electrical energy between two or more circuits.
Type J, K, KN: 3-Phase Transformers; Type G, F, FN: 1-Phase Transformers; Type JR, KR, KNR: 3-Phase Reactors;
Type GR, FR, FNR: 1-Phase Reactors; Type QT, HZQT: 3-Phase Transformers; Type Q, HZQ: 1-Phase Transformers; Type CV, CVHW (not filed with UL): 1-Phase Constant Voltage Transformers; Type E: 1-Phase Control Transformers; Type 3AH: 1-Phase Control Transformers

Rating:

Type J, K, KN: Rating Volts Up to 34.5KV & Up to 21MVA;

Type G, F, FN: Rating Volts Up to 34.5KV & Up to 7MVA;

Type JR, KR, KNR: Rating Volts Up to 15KV & Up to 5000A;

Type GR, FR, FNR: Rating Volts Up to 15KV & Up to 5000A;

Type QT: Rating Volts Up to 660V & Up to 150KVA;

Type HZQT: Rating Volts Up to 660V & Up to 150KVA; Class I, Division 2, Groups A, B, C and D (Hazardous Locations);

Type Q: Rating Volts Up to 660V & Up to 50KVA;

Type HZQ: Rating Volts Up to 660V & Up to 50KVA; Class I, Division 2, Groups A, B, C and D (Hazardous Locations);

Type CV, CVHW (filed with CSA only): Rating Volts Up to 600V & Up to 5KVA;

Type E: Rating Volts Up to 660V & Up to 15KVA;

Type 3AH: Rating Volts Up to 660V & Up to 16.5KVA;

Service Restriction:

1. Unit Certification is required for this product.
2. Transformers rated more than 1 kV (phase to phase) are to be provided with anticondensation heaters and are to have degree of protection not less than IP23 and if installed in spaces accessible to unqualified personnel the degree of protection is to be increase to IP44.
3. Transformers rated 1kV or less and over 10 kVA/phase are to be provided with anticondensation heaters, unless arranged for hot standby (energized throughout the standby period - in this case a warning plate is to be posted near the disconnecting device for primary feeder).
4. Interphase reactors and transformers used with semiconductors converters for main or auxiliary propulsion service are to be provided with high temperature alarms as per 4-8-5/5.17.10, set at not more than the limit listed in 4-8-3/7.3.2 as a function of relevant insulation class.
5. For Unit Certification requirements, see "Comments" .

Comments:

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. All LV (1 kV or less rated voltage) transformers rated 1 kVA or more (1-phase) and 5 kVA or more (3-phase) intended for essential or emergency services are to be tested by the Manufacturer, whose certificate of tests will be submitted to the Bureau. Routine tests are to include (as a minimum): measurement of winding resistance, voltage ratio, impedance voltage, short circuit impedance, insulation resistance, load loss, no-load loss and excitation current, phase rotation and polarity, dielectric strength and temperature rise for the prototype of each size and type.
3. All interphase reactors and three phase HV (more than 1 kV rated voltage) transformers (or 3-phase bank transformers) rated 100 kVA or more are to be tested in the presence of the Surveyor as per IEC 60076 and 4-8-3/7.3.5 and 4-8-5/3.7.5(e) of the Rules. Other HV transformers (less than 100 kVA) will be accepted on the basis of a performance test conducted after installation in the presence of the Surveyor.

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Tier: 5 - Unit Certification Required

4. Each transformer is to be provided with a nameplate in corrosion resistant material, showing all data as per 4-8-3/7.3.6 of the Rules. In addition, the nameplates of HV transformers are to show information about the applicable standard (IEC 60076) and the short duration power frequency withstand voltage for verification of insulation level of each winding in accordance with 4-8-5/3.7.5(f) of the Rules. 4) Protection degree of enclosure is to be not less than that specified by SVR 4-8-3/Table 2 or MODU 4-3-3/Table 1, as a function of the intended location.

Notes/Drawing/Documentation:

Document No.: HPS Declaration of Conformity, date: 22 March 2019

Document No.: UL Listing XPFS.E147879, Hammond Power Solutions Inc. Transformers, Issue date: 2018-07-11

Document No.: UL Listing XPJF7.E258346, Hammond Power Solutions Inc. Transformers, Issue date: 2019-04-04

Document No.: UL Listing XPTQ.E50394, Hammond Power Solutions Inc. Transformers, Issue date: 2017-09-12

Document No.: UL Listing NMTR.E61431, Hammond Power Solutions Inc. autotransformers, Issue date: 2019-05-07

Supporting Documentation:

CSA Certificate No: 003902 dated 2/27/2009

Typical 3AH Control Transformer Outline Dwg No: 3AH

SGS ISO 9001:2000 Certificate No: CA07/4094 issued 19 July 2007

Typical Transformer Outline Dwg Nos: CV, CVHW; E; J-K-KN-G-F-FN; JR-KR-KNR-GR-FR-FNR; Q, QT, HZQ, HZQT

UL File: NMTR2.E61431 dated 2002-07-08

UL File: QQFU.E90686 dated 2008-09-11

UL File: XPFS.E147879 dated 2002-10-28

UL File: XPJF.E258346 dated 2005-12-16

UL File: XPTQ.E50394 dated 2002-07-08

UL File: XQNX.E112313 dated 2002-07-08

UL File: XQNX2.E112313 dated 2002-07-08

Terms of Validity:

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STANDARDS

ABS Rules:

Rules for Condition of Classification, Part 1: 1-1-4/7.7; 1-1-A3, 1-1-A4, which covers the following:

2019 Steel Vessels Rules: 4-8-3/7, 4-8-5/3.7.5, 4-8-5/5.17.9;

2019 Marine Vessels Rules: 4-8-3/7, 4-8-5/3.7.5, 4-8-5/5.17.9;

Rules for Conditions of Classification, Part 1 - 2018 Offshore Units and Structures 1-14/9.7, 1-1-A2, 1-1-A3, which covers the following:

2019 MODU Rules: 4-3-5/Table 1, 6-1-7/11;

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Tier: 5 - Unit Certification Required

2019 MOU Rules: 4-3-5/Table 1, 6-1-7/11;

2019 Facilities Rules: 3-6/9

National:

C22.2 No. 47(2013);

UL 1562(2013), UL 1446(2016), UL 506(2017), UL 5085-1(2006), UL 5085-2(2006)

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA