



CERTIFICATE NUMBER	24-2535673-PDA
EFFECTIVE DATE	19-Apr-2024
EXPIRY DATE	18-Apr-2029
ABS TECHNICAL OFFICE	Houston ESD - Electrical

# CERTIFICATE OF Product Design Assessment

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

## HAMMOND POWER SOLUTIONS INC.

located at

**595 SOUTHGATE DRIVE, , GUELPH, ONTARIO, Canada, N1G 3W6**

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  
**Endorsements:**  
**Tier:** 5 - Unit Certification Required

This Product Design Assessment (PDA) Certificate remains valid until 18/Apr/2029 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)

**HAMMOND POWER SOLUTIONS INC.**

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**Tier: 5 - Unit Certification Required**

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**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

**Endorsements:**

**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 essential services or emergency services in accordance with 4-8-3/7.3.5 of the Marine Vessels Rules (MVR). For Unit Certification requirements, see "Comments".

2. Transformers of 10 kVA/phase and over are to be provided with effective means to prevent accumulation of moisture and condensation within the transformer enclosure where the transformer is disconnected from the switchboard during standby (cold standby) in accordance with 4-8-3/7.3.4 of the Marine Vessels Rules (MVR).

3. For high voltage system, transformer enclosures 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 in accordance with 4-8-5/3.7.5(c) of the Marine Vessels Rules (MVR).

4. Interphase reactors and transformers used with the semiconductor converters for main and auxiliary propulsion systems are to be provided with a high temperature alarm at the switchboard or the propulsion control station. The setting value of the alarm is to be determined by their specific insulation class and is not to exceed the temperature corresponding to the limit listed in 4-8-3/7.3.2 in accordance with 4-8-3/8.9.2(b) and 4-8-5/5.17.9 (c) of the Marine Vessels Rules (MVR).

**Comments:**

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in 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.

2. All Low Voltage (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

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**Tier: 5 - Unit Certification Required**

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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 three phase High Voltage (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 Marine Vessels Rules (MVR). 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.

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 Marine Vessels Rules (MVR). 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 Marine Vessels Rules (MVR).

5. Overvoltage Protection is to be provided by:

- i) Direct earthing of the lower voltage system;
- ii) Appropriate neutral voltage limiters, or
- iii) Earthed screen between primary and secondary winding of transformers.

See 4-8-5/3.5.5 of the Marine Vessels Rules.

6. 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 Marine Vessels Rules (MVR). 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.

**Notes/Drawing/Documentation:**

**Terms of Validity:**

This Product Design Assessment (PDA) Certificate remains valid until 18/Apr/2029 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.

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**STANDARDS**

**ABS Rules:**

2024 Rules for Conditions of Classification, Part 1, 1-1-4/7.7, 1-1-A3, 1-1-A4, which cover the following:  
2024 Marine Vessel Rules: 4-8-3/7, 4-8-5/3.7.5, 4-8-5/5.17.9

2024 Rules for Conditions of Classification, Part 1 - Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which cover the following:  
2024 Mobile Offshore Units Rules: 4-3-5/Table 1, 6-1-7/11

**National:**

C22.2 No. 47(2013);  
UL 1562(2013), UL 1446(2016), UL 506(2017), UL 5085-1(2006), UL 5085-2(2006)

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**Tier: 5 - Unit Certification Required**

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**International:**

N/A

**Government:**

N/A

**EUMED:**

N/A

**OTHERS:**

N/A