

# MARINE SOLUTIONS

Solutions for Marine Duty  
Applications



## HPS Marine Solutions Solutions for Marine Duty Applications

Our offering of single phase and three phase marine duty transformers has been developed utilizing over 100 years of commercial and marine experience in magnetic transformer design.

Our ABS type approved product lines have been engineered to meet the unique requirements of marine applications including:

- Commercial and Pleasure Ships
- Offshore oil rigs
- Tankers
- Near shore
- Other harsh marine environments



### Superior Quality & Service

- › Experienced customer service and technical support personnel are available to answer your questions immediately. Our commitment to customer service means you will be an informed, relaxed and satisfied customer.
- › Superior quality has been the standard since our inception. We build value and quality into every HPS product.
- › We emphasize our “Value Added Engineering” whereby our design staff will interface with your team to produce the optimum transformer.
- › Over 100 years of service means our customers have come to rely on our products and services. Our stability and integrity as a supplier are paramount, particularly in an industry environment where demands must be resolved quickly.
- › Our leading design capabilities places us among the best in the industry. Our extensive quality testing means our products will exceed your expectations.
- › All HPS facilities have implemented quality management systems based on ISO 9001:2015 with the Guelph, Ontario facility having certification to that quality standard.

### HPS Marine Duty Transformers

HPS offers a marine duty option on most product lines: HPS Sentinel Series, Dry-Type Medium Voltage Transformers, and is standard on our HPS Titan Series.

HPS dry-type marine duty transformers with three phase ratings up to 25MVA, 34.5kV and single phase to 5MVA, feature the newest technology and manufacturing processes.

#### **ABS Type Approval:**

Manufacturing Assessment Certificate No.: 19-EC3701074

PDA Certificate No.: 19-HS1854283-PDA

### Features

- › Copper or Aluminum windings
- › Dry-type convection cooled
- › 150°C, 115°C or 80°C temperature rise available
- › 220°C, 200°C or 180°C insulation system available
- › VPI Impregnation for salt environment
- › Fungus resistant
- › Braced for marine applications
- › Enclosures: Type 2 or Type 3R (per ABS requirements)
- › Stainless steel hardware (on units over 1000 kVA)
- › UV protection for outdoor enclosures
- › UL50 frames, channels etc.
- › CSA, UL and ABS approval (Lloyd's Register and DNV approval available upon request)

### Available Options

- › Type 4, 4X and 12 enclosures
- › Vibration mounts
- › Additional primary taps
- › Electrostatic shielding
- › Hot service or standby heaters
- › DNV, BV, Lloyds



## HPS Products

### HPS Encapsulated Transformers for Harsh and Hazardous Locations

HPS Titan series encapsulated transformers are used in installations where safety is your priority, efficiency is a concern and the environment, location and application are key.

HPS Titan series has been designed to operate in harsh environments/hazardous locations where dangerous gases, liquids, dust, etc., could lead to serious consequences. Typical applications include institutional, commercial, industrial, petrochemical, marine, mining, etc.

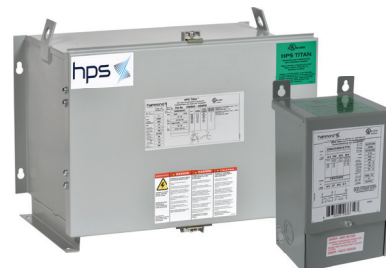
- › HPS Titan N - UL Listed for "Class 1, Division 2, Group A, B, C, D and Class I, Zone 2, Group IIC, T3 Hazardous Locations, ABS Type Approval for "Marine Duty Service and Offshore Applications - Electrical Distribution and Propulsion" and a North American Temperature Classification of T3C/T3A.
- › HPS TITAN X - IEC 60079-0, IEC 60079-7, 5.1 - Hazardous Locations Class I, Zone 2, Group IIC, T3

### Compliance & Approvals

- › ANSI/ISA 12.12.10 - File No. E258346 (Class 1, Division 2, Groups A, B, C, D and Class 1, Zone 2, Group IIC, T3 Hazardous Locations) - T3C/T3A Temperature Classification
- › UL 5085-1 and UL5085-2 Listed - File No. E258346
- › ABS Type Approval (Marine Duty Service and Offshore Applications certified)
- › HPS Titan X only:

CE Ex II 3G  
DEMKO 21 ATEX 2235X  
IECEx UL 21.0116X  
EX ec IIC t3 Gc

UK  
CA  
UL21UKEX2340X



### HPS Autotransformers and Distribution Transformers

HPS offers three phase autotransformers that are available for applications where voltage adjustments are necessary in a distribution system. They are frequently used as an economical alternative to three phase general purpose distribution transformers to adjust the supply voltage to match specific load requirements when load isolation from the supply line is not required. Autotransformers can be used as either a step-up or step-down transformer.

HPS offers diverse lines of energy efficient low voltage distribution transformers. They can be designed for use in applications with high harmonic current, in either a step-up or step-down format.

One of the challenges in addressing marine and offshore applications that are often remote generation locations is to ensure the equipment is rugged enough to withstand the seismic and moisture extremes as well as the damaging effects of lightning. HPS has the experience delivering these custom quality products to OEM operators on a worldwide basis.



### Compliance & Approvals

- › UL Listed (File: E112313)
- › CSA Certified (File: LR3902)



## HPS Medium Voltage (Power) Transformers

HPS has decades of experience designing medium voltage power transformers for the difficult applications and environments found in the marine and offshore applications. HPS offers a wide range of dry-type VPI (HPS Millennium) and Cast Coil (HPS EnduraCoil™) products. Dry-type transformers offer several advantages over oil transformers including lower fire risk, fewer environmental contamination concerns, proven insulation systems for high ambient temperatures and lower installation and maintenance costs.

- ISO 9001:2015 manufacturing and engineering processes
- Global VPI approval performance levels including: UL, CSA, IEC, ABS, DNV, BV, and Lloyds
- Global Cast Resin approval performance levels including: UL, CSA and IEC

## Compliance & Approvals

HPS medium voltage transformers are CSA certified and UL Listed to the following standards:

- CSA C22.2 No. 47
- CSA C9-02
- UL 1562
- Compliant to the following industry standards:
  - IEEE-C57.12.01
  - IEEE-C57.12.51
  - IEEE-C57.12.70
  - IEEE-C57.12.91
  - DOE 10 CFR Part 431: 2016
  - NRCAN SOR/2018-201
  - IEC 60076 (upon request)
  - California OSHPD (upon request)



### Enclosures

HPS has enclosures available for harsh marine duty environments. The selection of the appropriate enclosure is vital for long term reliability of the equipment and facility.

HPS enclosures are designed and approved in accordance with specifications CSA 22.2 No. 47 (General Purpose), CSA 22.2 No. 94 (Specialty Enclosures) and UL 50.

The following is a list of marine duty enclosures available and a brief description of their applications:

**Type 2** - A ventilated enclosure constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt and to provide a degree of protection against dripping and light splashing of liquids (optional sprinkler hoods are available). Also available in a non-ventilated version.

**Type 3R** - A ventilated enclosure constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice on the enclosure (also available in a non-ventilated version).

**Type 3RE Plus** - HPS Type 3RE Plus enclosures provide the ultimate solution for safeguarding Medium Voltage transformers against the most unforgiving outdoor conditions, including relentless rain and snowstorms.

Resilience to Snow and Rain: Through rigorous testing it withstood wind speeds of up to 120 km/h (with snow) and snow particles as tiny as 350 microns. Additionally, it excelled in rain tests, enduring wind speeds of up to 130 km/h, with a water discharge rate of 7.5 GPM.

Enhanced Outdoor Design: Designed for outdoor applications with advanced features such as louvers, filters, and a slanted enclosure roof.

Simple Filter Replacement: Easily replace filters even when the transformer is energized.

Certification & Testing: UL certified and has a notable level of protection with proven test results.

**Note:** While our enclosure is designed to withstand severe weather conditions, we recommend consulting with our experts to ensure proper protection for your specific needs. Your safety is our priority.

**Type 4** - A non-ventilated enclosure constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure. **Note:** not submersible.

**Type 4X** - A non-ventilated enclosure constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water and corrosion; and that will be undamaged by the external formation of ice on the enclosure. **Note:** not submersible.

**Type 12** - A non-ventilated enclosure constructed (without knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint fibers, and flyings; and against dripping and light splashing of liquids. **Note:** not water tight.



**Type 3R Enclosures**



**Type 4 Enclosures**



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