



## Asian Capabilities



Hammond  
Power Solutions

# Our Global Solutions

## COMPANY

With our headquarters in Ontario, Canada, Hammond Power Solutions (HPS) operates out of multiple plants located throughout Canada, India, US, and Mexico. HPS has expanded its manufacturing and product base to offer the broadest range of both standard and special transformers.

**Founded:** 1917

**Number of employees:** 1,330

**Ownership:** Hammond Power Solutions (HPS) is a public company traded on the Toronto Stock Exchange ("HPS.A")

In 2012, HPS expanded into India through the acquisition of Pan-Electro Enterprises Private Ltd. With over 30 years experience, their continued focus on product innovation, consistent quality and competitive pricing is what has made them a successful global company.



Ontario, Canada



Hyderabad, India

## CAPABILITIES

HPS offers a broad range of standard and custom transformer capabilities through our International Companies:

### Asia - Sales & Manufacturing

Hammond Power Solutions Pvt. (India)  
- Oil Filled, Cast Resin & VPI

### North America - Sales & Manufacturing

Hammond Power Solutions Inc. (Canada & U.S.A)  
Hammond Power Solutions S.A. de C.V. (Mexico)  
-VPI & Cast Resin

### Europe, Middle East and Africa - Sales

Hammond Power Solutions S.p.A. (Italy)  
-VPI & Cast Resin

## COMPETITIVE EDGE

North American stand-alone leader for the design and manufacture of standard & custom electrical engineered dry-type transformers.

- Multi-national manufacturing presence
- Multiple channels to market
- Highly regarded for our engineering expertise
- Dominant supplier in the transformer industry
- Globally recognized and respected

## MISSION

We are a growing and profitable supplier of transformers and related magnetic products dedicated to satisfying the collective needs of our shareholders, customers, suppliers, employees and community.

## VISION

To be the leader in our industry by delivering:

- Lead times as defined by our markets
- A broad range of products
- Quality in all that we do
- Technical expertise
- Consistently strong financial performance

## VALUES

- We value honesty, integrity and ethical behavior in our relationships with all stakeholders.
- We value innovation and a relentless pursuit of continuous improvement in all our processes.
- We value timely decisions based on facts and knowledge.
- We value a team-oriented approach.
- We value the personal safety of all stakeholders.
- We believe in treating all stakeholders with dignity and respect.



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## CUSTOMERS

Through our extensive standard and custom product offering, HPS is able to provide a convenient one-source solution.

Our engineering design staff work directly with you to produce the most optimum and cost-effective solution for your application. We will design to your specification requirements, and all transformers are built with modern manufacturing techniques.



## MARKETS



Industrial



Commercial



Petrochemical



OEM



Utility



Solar Power



Mining



Wind Power



Chemical

## GLOBAL PRODUCT OFFERING

### Dry-type Transformers & Reactors

Offer thousands of standard transformers up to 35MVA, 46kV Class

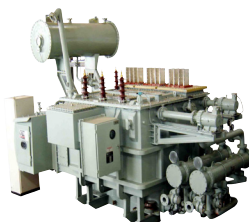
- Autotransformers
- Buck-Boost Transformers
- Control Transformers
- Custom Products
- Drive Isolation Transformers
- Encapsulated Transformers
- Energy Efficient Distribution Transformers
- DV/DT Filters
- Medium Voltage Distribution (Power) Transformers (Energy Efficient Option)
- Reactors (Current Limiting, Damping, Tuning, & Smoothing Reactors)

### Cast Coil Transformers

- Transformers up to 10MVA, 36kV Class
- Standard and custom design units for various applications including renewables, drives, mining, marine & offshore, pole mounted and other specialized applications.

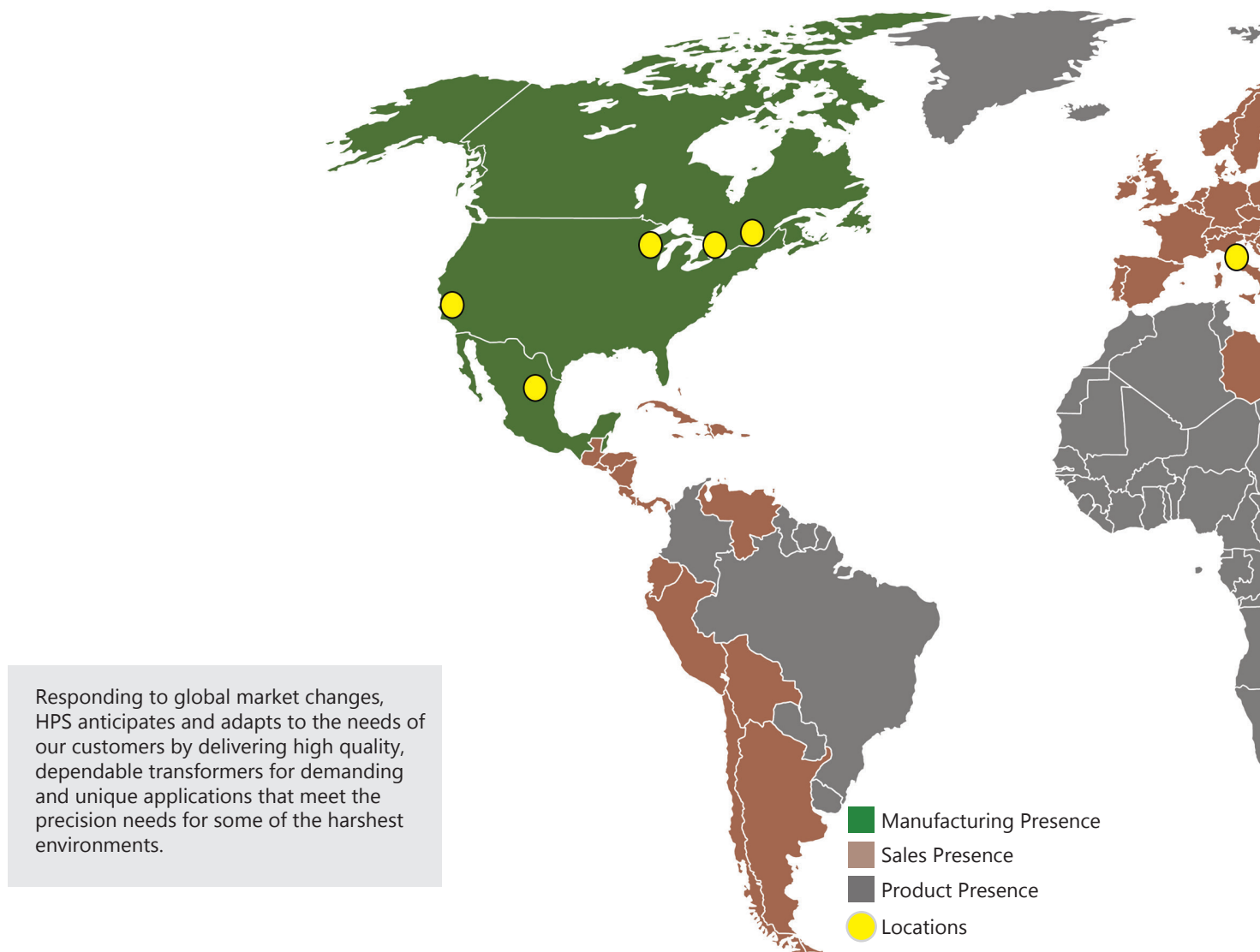
### Liquid Filled Transformers

- Transformers up to 50MVA, 138kV Class
- Distribution, power and specialized type units
- Designs for various applications including steel mills, mining, drives, solar and other specialized applications.





# Global Presence & HPS Asia Facilities



## HPS Asia Facility

HPS is located near Hyderabad City, in one of the largest industrial estates of India. Our four manufacturing plants total 50,000 square feet, equipped with production equipment and testing facilities.

HPS manufactures a wide range of Oil Filled, VPI and Cast Resin transformers:

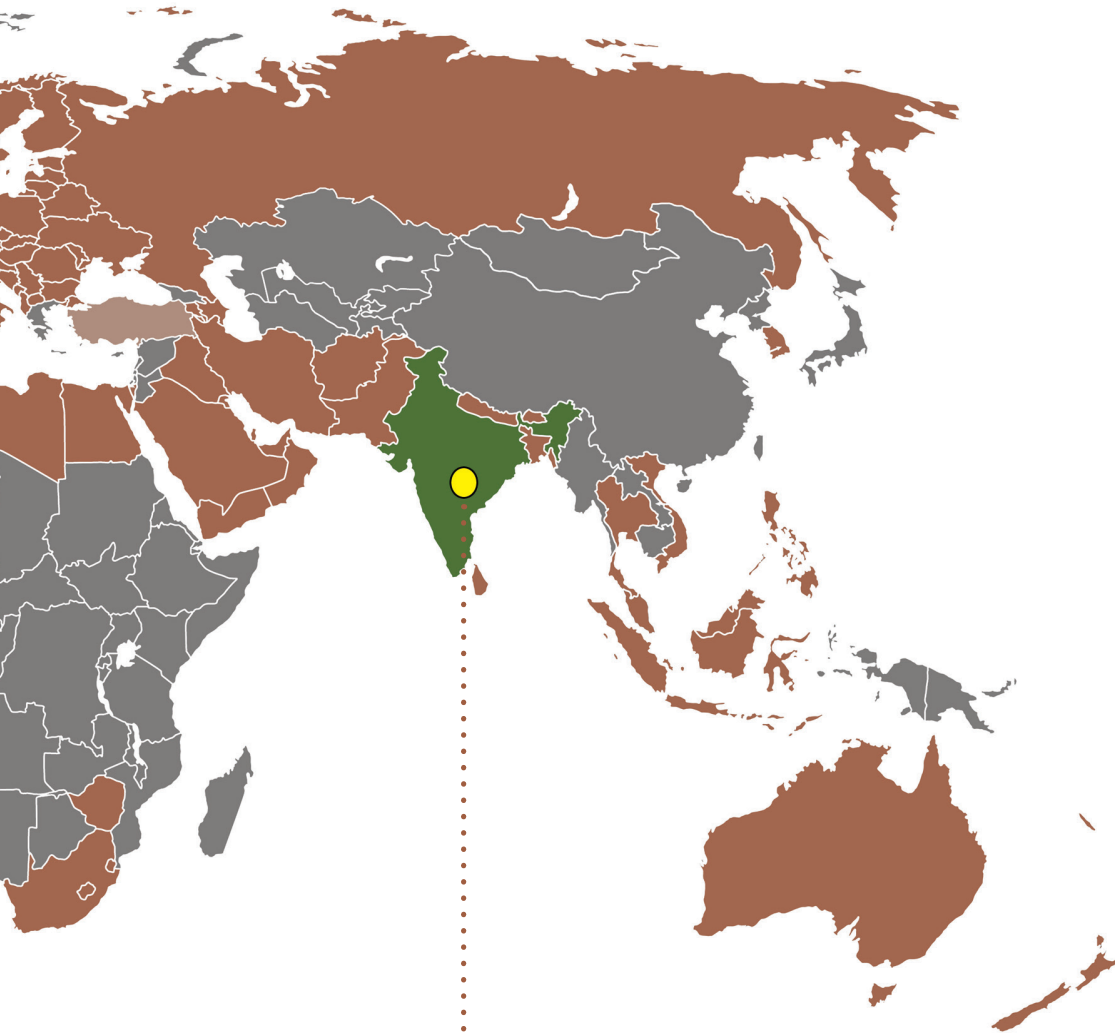
- Oil Filled transformers up to 50MVA (ONAN), 138kV Class
- Vacuum Pressure Impregnated (VPI) transformers up to 6MVA, 25kV Class
- Cast Resin transformers up to 10MVA, 35kV Class

Facility capabilities include:

- Uninterrupted power back-up for all operations
- Coil winding machines in separate controlled areas
- Ultra high vacuum filters & ovens
- Stabilization of coils with hydraulic jacks
- Fabrication of transformer tanks
- Standard & type testing using automated test benches







HV Winding Area



Service Refurbishment Facility



Vacuum & Drying Equipment



HV Test Lab



Foil Winding



Core Assembly Area

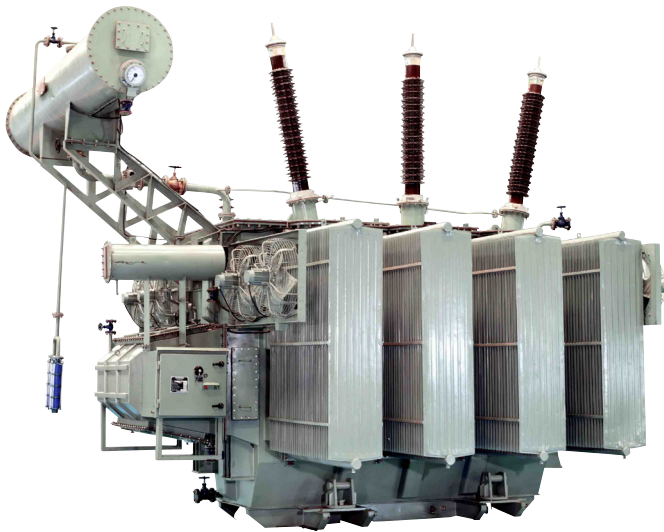
# Products

## Diverse Technology

HPS offers a variety of Oil Filled, VPI and Cast Resin transformers. Through our standard and custom design capabilities we are able to meet all of your application challenges.

HPS designs and manufactures the following transformer types:

- Power Transformers (138 kV) up to 50 MVA ONAN
- Distribution Transformers
- Unitized Substations
- Energy Efficient Transformers
- Specialty Transformers:
  - Arc Furnace Transformers
  - 6/12/24 Pulse Furnace Transformers
  - Converter Duty Transformers
  - Induction Transformers
  - Rectifier Transformers
  - Multipulse Transformers
  - Multi-Winding Solar Transformers
  - Generator Transformers
  - Transformers for Renewable Energy



Oil Filled Transformer



Cast Resin Transformer



VPI Transformer

### Oil Filled Transformers

**up to 50MVA, 138kV Class**

Example Applications Include:

- Utilities
- Industrial
- Wind
- Commercial
- Solar
- Mining
- Oil & Gas

### Cast Resin & VPI Transformers

**up to 10MVA/20MVA (Cast/VPI)**

Example Applications Include:

- Marine
- Industrial
- Solar
- Commercial
- Oil & Gas
- Mining
- Wind
- Data Centers

## COMPACT SUBSTATIONS



Compact Substations refer to a single housing that typically includes a high voltage switch or breaker, transformer and low voltage protection or distribution equipment. Compact substations can also be categorized as unitized substations, solar "PV Box" substations and to some degree padmounted transformers. They are all designed to reduce space requirements, avoid field assembly of critical components and reduce handling costs in the field.

Typical compact substation (CSS) designs are used for applications where the unit is located in public areas since the integrity of the enclosure is considered tamperproof.

Standard features include:

- Completely factory assembled and tested
- Compact designs to reduce space
- Selection of HV and LV equipment to meet customer requirements

## UNITIZED SUBSTATIONS



Unitized substations are designed to provide a complete substation in one enclosure. HPS can incorporate HV and LV equipment on both sides of the transformer to meet system requirements. Enclosures are designed to provide protection against environmental elements and provide protection from outside contact.

Each substation can be designed with specific components required for your application requirements.

Standard features include:

- Highly engineered solution to meet application requirements
- Factory built and ready for network solution
- Suitable for adverse weather conditions and temperatures
- In accordance with IEC 62271

## DRY-TYPE TRANSFORMERS



HPS offers both cast resin and VPI transformers utilizing the best insulating materials resulting in designs suitable for almost any application in the world. With the increasing trend towards safer transformer designs, HPS bring many years of experience in dry-type technology to meet these demands in safety and reliability.

Standard features include:

- Cast resin ratings up to 10MVA and VPI rating up to 6MVA
- Insulation systems up to 220°C
- Energy efficient designs
- Various enclosure options available according to IEC or IEEE standards
- On-load tap changers available



# Products

## POWER TRANSFORMERS



HPS power transformers incorporate modern design and production capabilities to provide cost effective and energy efficient designs for almost any application. Various liquids are available including environmentally friendly options offering higher flash points.

Features include:

- Ratings up to 50MVA (ONAN), 138kV Class
- On-load tap changers available
- Ability to design to specific customer specifications

## DISTRIBUTION TRANSFORMERS



HPS distribution transformers are available for both indoor and outdoor applications. They are typically used for voltage conversion from 35kV and below. Various designs are available including corrugated tank.

Standard features include:

- Ratings up to 10MVA, 35kV class
- Various liquids available including mineral oil, ester fluids, etc.
- Specialized designs available including on-load tap changers
- Various tank design options: conservator, sealed tank, free breathing and corrugated.

## CONVERTER TRANSFORMERS



Converter transformers are used in industries such as cement and steel plants, and other related applications. Converter transformers are designed and manufactured to meet specific application needs.

Standard features include:

- Galvanic barrier between the AC & DC system to prevent the DC from potentially entering the AC system.
- Extended Delta/Phase shifting option
- Total harmonic distortion

## PADMOUNT TRANSFORMERS



Padmount transformers are totally enclosed with tamperproof assemblies, making it suitable for operation in public areas while providing a complete system including HV fusing protection and switching capabilities. Various options are available on the LV side including a main breaker and feeders. Everything is housed in a tamperproof enclosure in accordance with IEEE standards.

Options include:

- HV Bushing: Dead front bushings - bushing wells, inserts (single or feedthroughs), radial & loop feed designs
- LV Bushing: Epoxy bushing or porcelain
- Load break switches (under oil)
- Over current/over voltage protection option

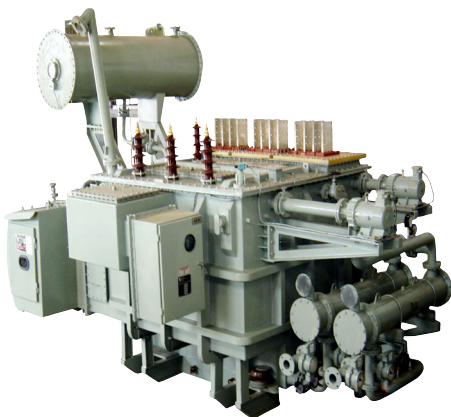


## REGULATING TRANSFORMERS

Regulating transformers are available using both liquid filled and dry-type technology to regulate the outgoing voltage on the system. With requirements becoming increasingly demanding for constant voltage supply, these transformers incorporate reliable on-load tap changers designed to provide a constant output voltage from a variable input voltage. Designs allow for low impedance values while maintaining a high degree of reliability.

Standard features include:

- Excellent regulation
- Higher efficiency compared to conventional transformers
- Three phase



## FURNACE TRANSFORMERS

Furnace transformers are widely utilized where there are high current requirements such as in the steel and cement industries. They require high current levels that must also be variable due to the frequent short-circuits. These transformers must be designed to resist the high levels of electrical, thermal and mechanical stresses to which they are subject to during utilization. They are highly regarded for their high level of quality and reliability for many demanding applications.

Various types of furnace transformers are available such as Arc Furnace, Submerged Arc Furnace, Ladle Furnace and Induction Furnace.

Standard features include:

- Low voltage current ratings up to 40kA
- Primary voltage rating up to 66kV
- Various cooling methods available: ONAN, ONAF, OFWF
- Designed to withstand harsh environments



## MULTI-PULSE TRANSFORMERS

Multi-Pulse transformers are designed specifically for inherent harmonics, voltage distortion and other unique characteristics associated with drive systems. They provide required supply voltage with the desired phase angle between secondary voltages for VFD systems/converters. Oil filled and dry-type options are available.

Standard features include:

- Designed to specific system requirements
- Voltage up to 25kV
- Up to 48 pulse designs
- 220°C insulation system
- Comply with IEC 60076-11; IEC 61378; IEE C 57, 18, 10, IEEE C57, 110

# Testing/Service



## Testing

All transformers are tested at the manufacturing facility prior to shipment. They must meet all quality criteria prior to release.

- Full fledged automated in-house testing to carry out all routine tests conforming to applicable standards
- Type Tests can be performed in-hour or using independent third party laboratories, including the Central Power Research Institute (CPRI) in India. Any short circuit testing is performed at off site laboratories.

### Standard Tests:

- D.C. Resistance Measurement
- Polarity and Phase-Relation Test
- No-Load and Excitation Current Test
- Voltage Ratio
- Impedance Voltage and Load Loss Test
- Dielectric Tests
- Applied Voltage Test
- Induced Voltage Test

### Optional Type Tests

- Temperature Rise Test
- Sound Level Test
- Partial Discharge (corona)
- Impulse Test (BIL)
- Short-Circuit Test
- Customers are welcome to witness tests and perform factory inspections

## Field Service Capability

HPS provides comprehensive transformer service to ensure that your transformers operate at optimum performance. Our field service team provides preventative maintenance that minimizes future unscheduled downtime and extends the life of the transformer.

- Offer an annual maintenance contract for transformers of any make/model within India
- Equipped with mobile transformer maintenance units comprised of high vacuum filters and on-site testing equipment
- On-site servicing, reconditioning and testing of any transformer make/model
- Erection, commissioning and overhauling of transformers
- Substation consultant services

## Refurbishment Services

Refurbishment services are available including rewinding of transformers of any make/model, up to 50MVA, 138kV Class.



On-site servicing of 220kV Class Transformer



High Vacuum Filter Machine 6000 LT / Hour Capacity





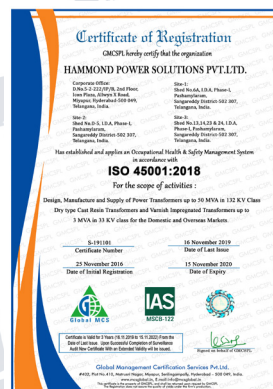
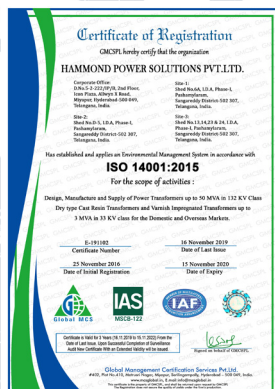
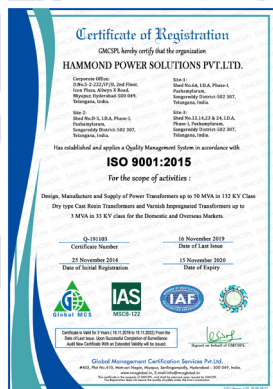
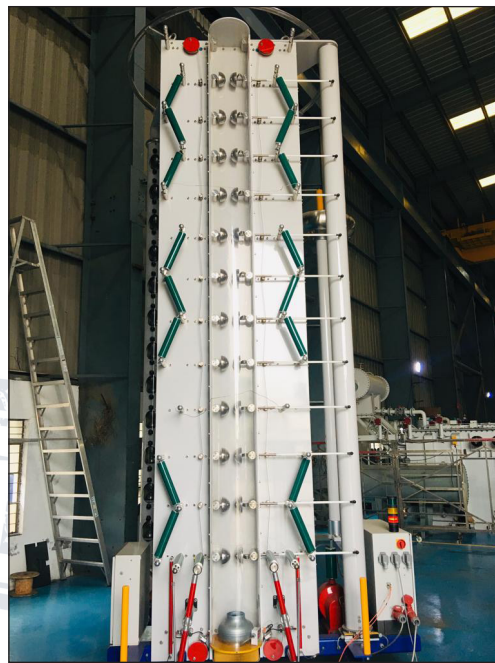
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# Quality/Standards

## Quality Systems: ISO 9001:2015

Our manufacturing facility has implemented Quality Management Systems based on ISO 9001. ISO 9001 includes all processes affecting quality, customer satisfaction and continuous improvement. Our customers can be assured of the integrity and quality of all HPS transformer products.

HPS laboratory testing facilities verify product materials including copper, core steel, bushings, PRV, temperature indicators and other accessories.



## Engineering Standards

HPS transformers are approved or comply with the following regulatory standards:

- IEEE Series
- IEC 60076
- BIS 1180
- IS 2026, IS 11171
- Comply with other standards as applicable

## Registrations

HPS is qualified by an extensive list of top Asian customers.



# Asian Capabilities



CANADA



UNITED STATES



ASIA

## CANADA

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