



# Solar Energy Solutions

power to perform

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## OUR EXPERIENCE

The Solar Energy market covers a broad range of applications and environments, and demands a high level of safety and reliability. Hammond Power Solutions (HPS) offers the broadest variety of transformer and reactor solutions for the difficult applications found in the solar energy market. Whether it's a standard transformer or reactor, or a custom built, HPS has the experience to provide a magnetics solution for your application.

HPS draws from a large design team with hundreds of years of combined experience to find a solution to your magnetics needs. Our factories in North America, Europe and India combine to provide the manufacturing expertise and deliverables the solar energy market requires. The engineering and manufacturing experience and dedication to quality and service are the foundation for our success as a leading transformer manufacturer. This provides our customers with the confidence to make their projects successful.



## HPS PRODUCTS

### Reactors

HPS offers a standard line of HPS Centurion® R Reactors that provides a unique blend of performance and reliability while reducing the products footprint. HPS Centurion R can be used in a wide variety of power quality applications.

Whether your application requires a reactor designed to handle different frequencies or low losses or even integrated into an assembly with a step-up distribution transformer, HPS can design a solution to meet your need.

Standard features include:

- Sizes available for 0.5 to 1200 HP motors
- Maximum system voltage is 600/690V
- Standard core & coil (optional Type 2 or 3R enclosure)
- 50/60 Hz
- UL Listed, CSA Certified and CE Marked





## 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.

Standard features include:

- Three phase from 3 kVA to 500 kVA
- Copper and aluminum available
- UL Listed and CSA Certified
- Type 3R Enclosure
- Accessible Neutral connection



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 utility solar energy applications that are often remote generation locations is to ensure the equipment is rugged enough to withstand the temperature and moisture extremes as well as the damaging effects of lightning. HPS has the experience delivering these custom quality products to OEM's and Energy operators on a worldwide basis.

Standard features include:

- Single phase ratings from 15 kVA to 333 kVA and three phase from 15 kVA to 1500 kVA
- Meets C802.2-12, DOE 2016 and NRCAN 2019 energy efficiency standards
- 10kV BIL on all three phase transformers
- Copper and aluminum available
- UL Listed and CSA Certified
- Type 3R enclosure
- Pre-installed lugs (up to 270 Amps)
- Standard primary/secondary winding configurations typically used in solar applications

## HPS Medium Voltage (Power) Transformers

HPS has decades of experience designing medium voltage power transformers for the difficult applications and environments found in the solar energy markets. HPS offers a wide range of dry-type vacuum pressure impregnation (VPI, HPS Millennium™) and Cast Resin (HPS EnduraCoil™) products.

- Options up to 34 MVA, 46 kV Class and 250 kV BIL
- ISO 9001:2008 manufacturing and engineering processes
- Meets or exceeds CSA C22.2 No. 47, CSA C9-02, DOE 10 CFR Part 431 and NRCAN SOR/2018-201 efficiency levels
- 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



# Solar Energy Solutions

## Custom Capabilities

The HPS Design Team of passionate engineers and support staff are dedicated to solving real-world transformer challenges for a broad range of customers.

We have experience designing transformers for a variety of solar applications, including those shown in the images below. For example, HPS offers step-up transformers for commercial and utility applications, including zig-zag and grounding units.

We quickly design to your specifications. Our custom designs can be found in some of the most extreme environments.

HPS has the capabilities to manufacture VPI, Cast Resin and Liquid Cooled transformers through our global facilities. Liquid cooled transformers may not be available in all regions.

Some examples of HPS' custom design capabilities include:

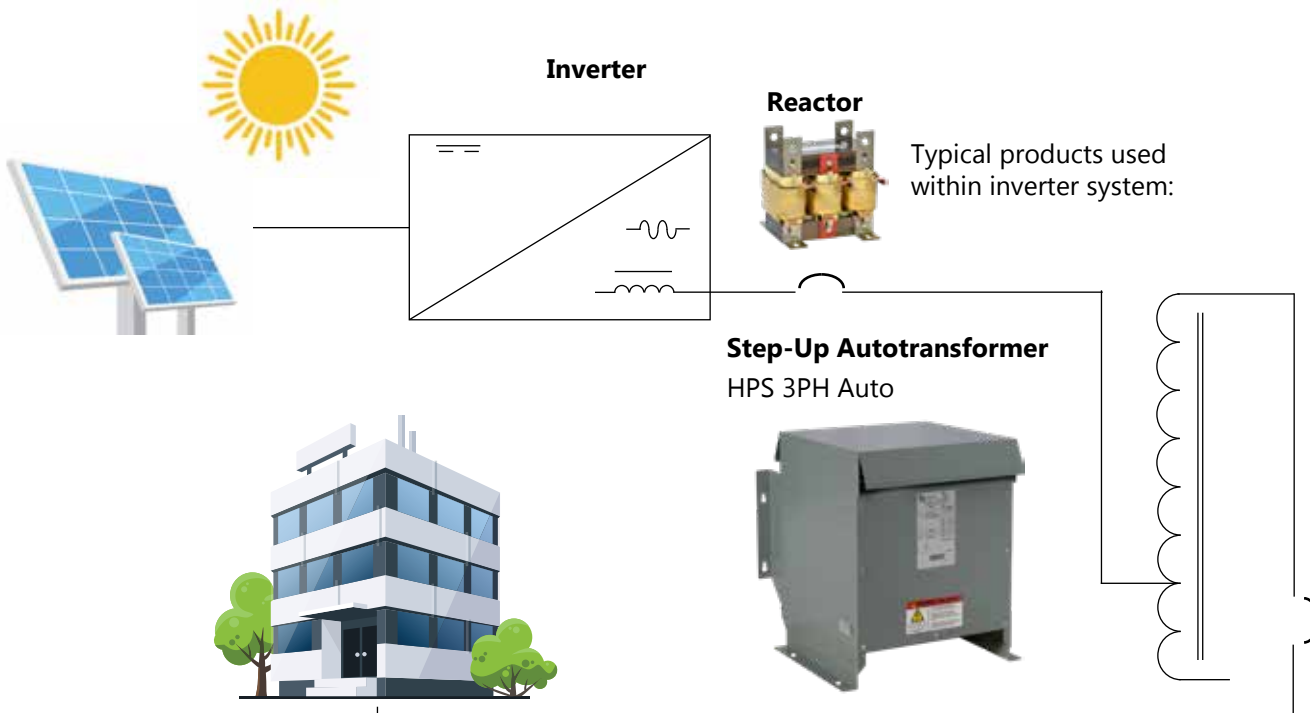
- Power Conditioning
- High Efficiency
- Low Noise
- Low Temperature Rise
- Matching Impedance
- K-Factor Rated
- Harmonic Mitigation
- Size/weight constraints
- Custom enclosures
- Unique input and output voltages
- Low Inrush
- Inverter and Rectifier Duty



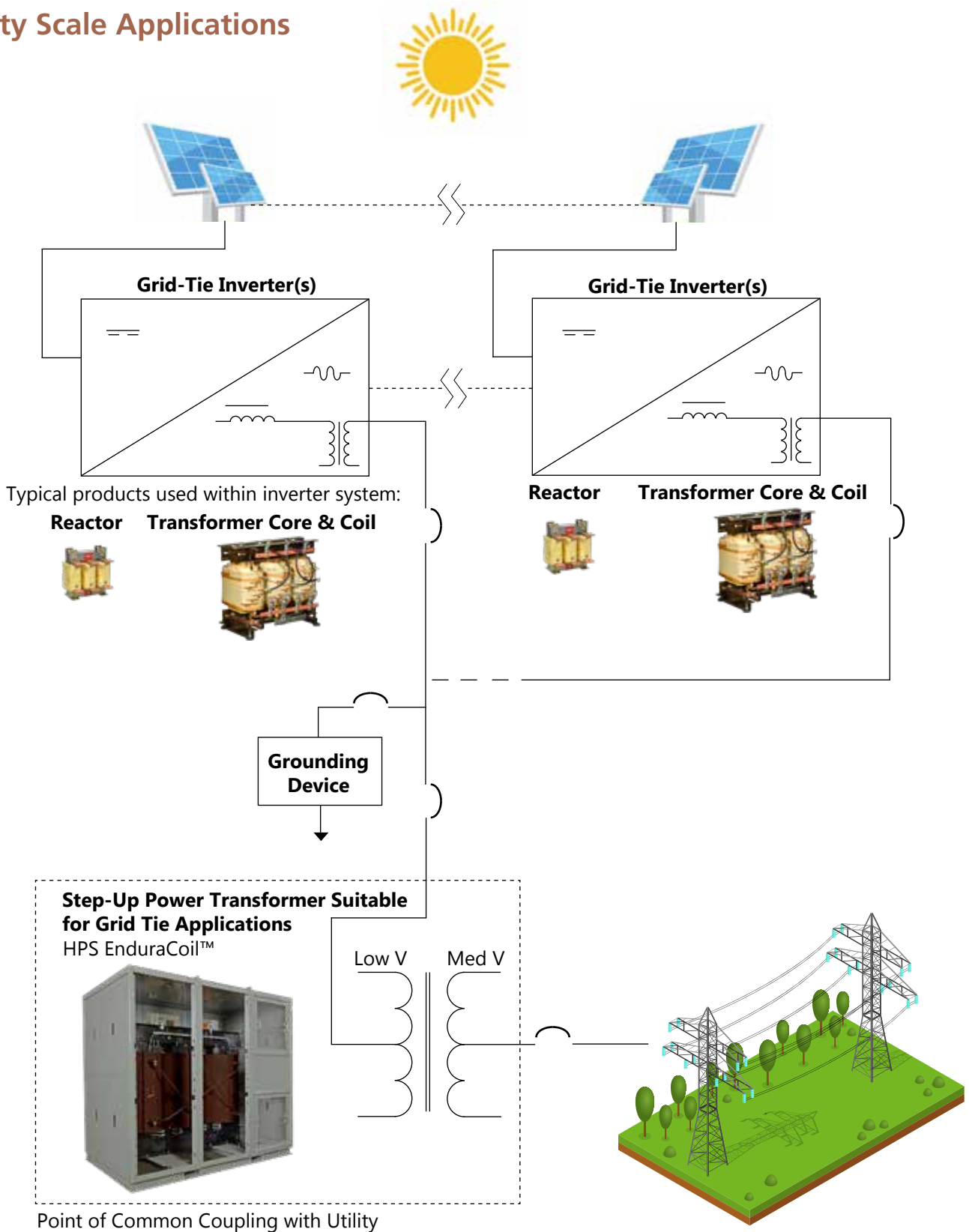
Custom Enclosure (Type 3R Enhanced) - Typically Used on Outdoor Applications Like Solar Farms

## HPS PRODUCTS IN SOLAR APPLICATIONS

### Stand-Alone Commercial Applications



# Utility Scale Applications





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