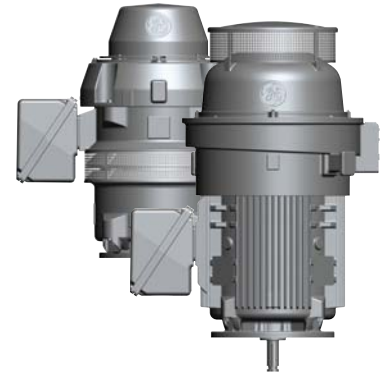


GE  
Power Conversion

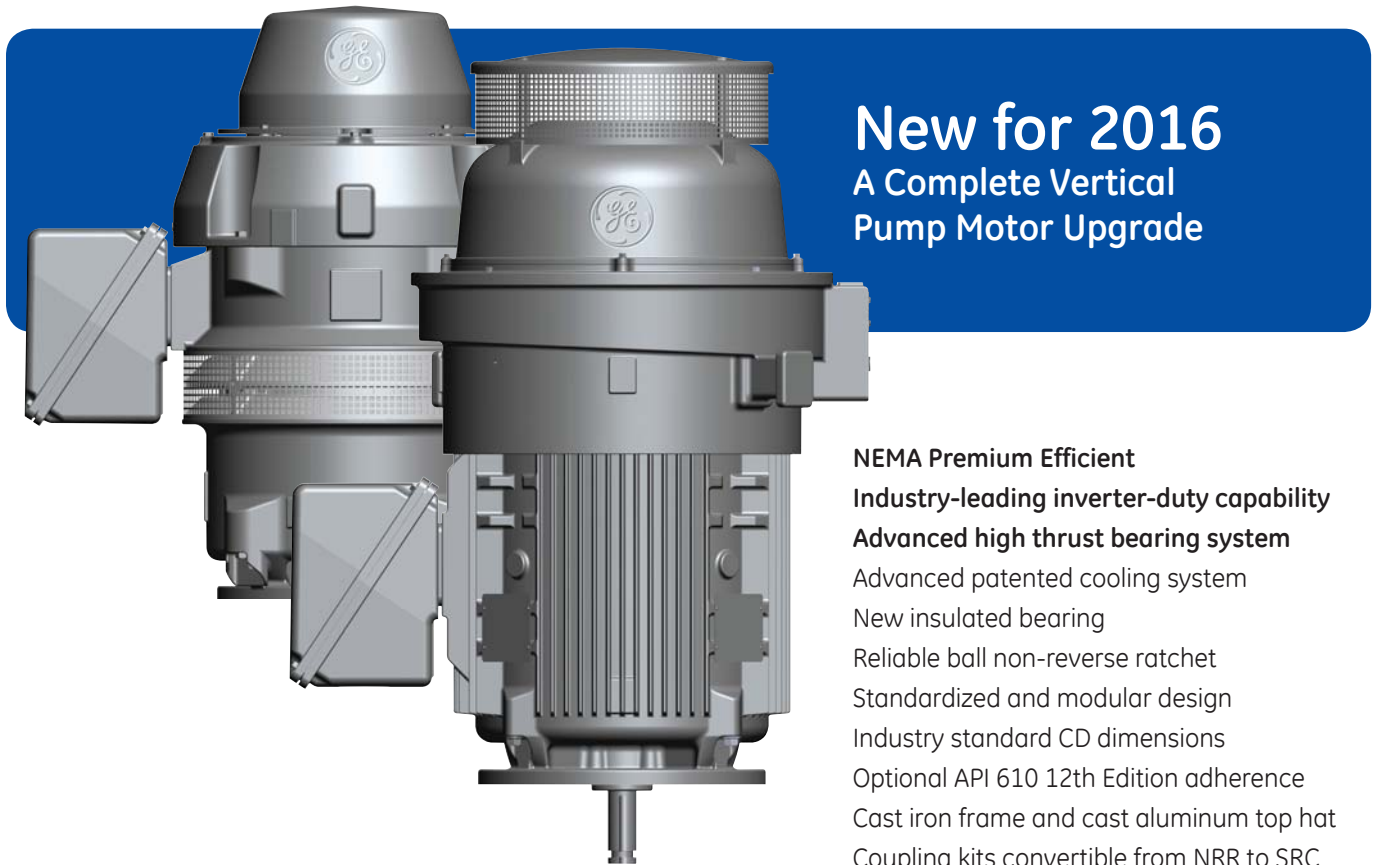


# Ultra<sup>TM</sup> Vertical Pump Motors

Rugged and reliable vertical motors  
for challenging inverter-duty applications

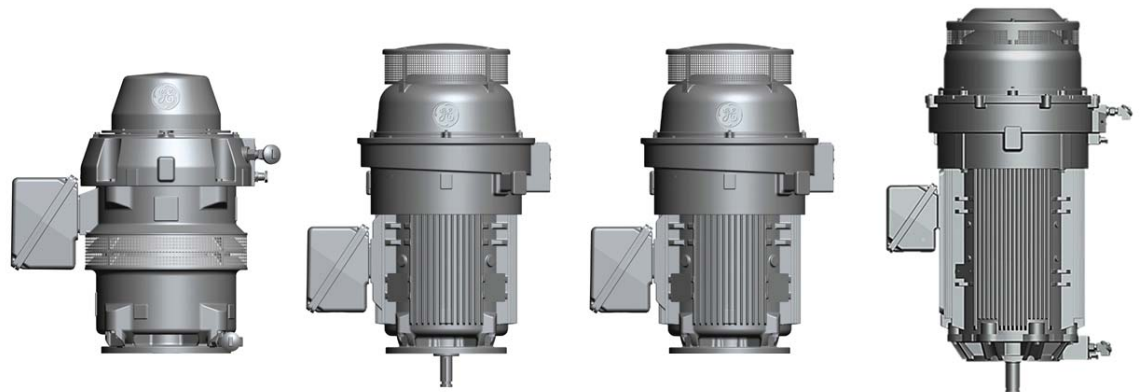


# Motor technology for tomorrows challenges.



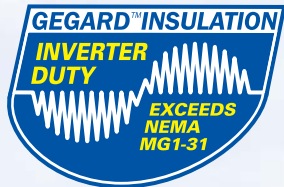
## New for 2016 A Complete Vertical Pump Motor Upgrade

- NEMA Premium Efficient**
- Industry-leading inverter-duty capability**
- Advanced high thrust bearing system**
- Advanced patented cooling system
- New insulated bearing
- Reliable ball non-reverse ratchet
- Standardized and modular design
- Industry standard CD dimensions
- Optional API 610 12th Edition adherence
- Cast iron frame and cast aluminum top hat
- Coupling kits convertible from NRR to SRC



Product Name	WPI Ultra™ VHS	XSD Ultra™ VSS NT	XSD Ultra® VHS	XSD Ultra® 841 VSS
Enclosure/Shaft Type	WPI hollow shaft	TEFC solid shaft	TEFC hollow shaft	TEFC solid shaft
Speed	1200, 1800, 3600	1800/3600	1800, 3600	1800, 3600
Voltage (60Hz*)	230/460, 460 PWS, 575, 380-440	230/460, 460	230/460, 460 PWS	460
Base/Face	P-Base	P-Base	P-Base	P-Base and C-Face
Thrust	100, 175, 300% High	Normal	100, 175, 300% High	Inline and 100% High
HP Range (Standard)	5 - 600	3 - 150	5 - 300	3 - 300
HP Range (Custom)	5 - 1000	3 - 500	5 - 600	3 - 500
Efficiency	NEMA Premium	NEMA Premium	NEMA Premium	NEMA Premium
Warranty	3 Years	3 Years	3 Years	3 Years

Notes: \*Also dual 50Hz nameplated.



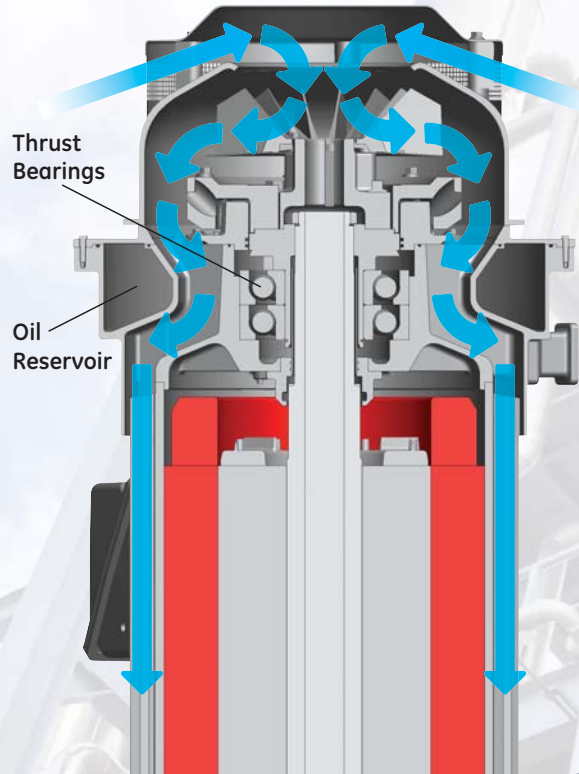
## Industry leading coil insulation system

GE pump motors are manufactured standard with a GEGARD2400 insulation system. This system exceeds NEMA MG1-31 (which is 3.1 times the nameplate voltage) for motors operating on inverters.

This insulation system is comprised of class H materials. The combination of this and the varnish process provides a typical Corona Inception Voltage of 2400 volts peak with a rise time of 0.1 seconds.

## Innovative patented air-cooling technology

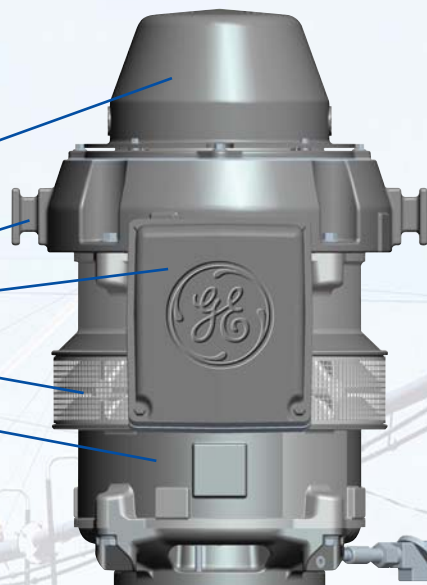
GE engineers found a better way to air cool bearings in larger frame TEFC motors. The design improvements result in an amazing ~30°C temperature reduction helping to dramatically extend bearing and winding life.





## The most robust WPI vertical hollow shaft motor in the industry

- Cast aluminum top hat
- Multi-direction cast in lifting lugs
- Oversized cast iron conduit box
- Aluminum anti-rodent screens
- Heavy-duty cast-iron frame



### Standard VHS Scope

	WPI Ultra	WPI Ultra+
Efficiency	NEMA Premium	NEMA Premium
HP	5-400	40-600
Warranty	3 Years	3 Years
Speed	1200, 1800, 3600	1800
Thrust	100 or 175% HT	100, 175%, 300% HT
Voltage	230/460, 460 PWS	230/460, 460 PWS, 575

### VHS Standard Features

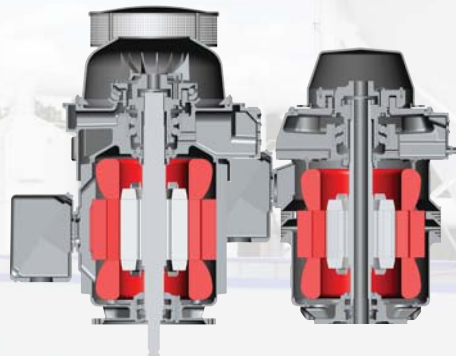
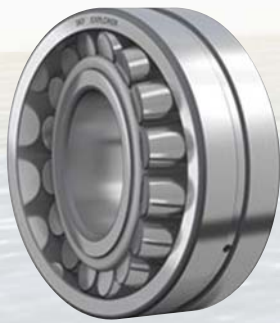
	WPI Ultra	WPI Ultra+
NEMA Premium Efficiency	Yes	Yes
Space Heater	Yes	Yes
GEGARD 2400 Inverter Duty Insulation	Yes	Yes
Class H Insulation System	Yes	Yes
3 Year Warranty including Inverter Duty	Yes	Yes
Winding Thermostats		Yes
Insulated Thrust Bearings		Yes
Shaft Grounding Ring on NDE		Yes
Aegis SGR Extended Warranty		Yes



## 20% average higher standard thrust

GE high thrust vertical pump motors have, on average, 20% higher thrust and extended performance than any other similar product in the industry. As a result, motors in all deep well applications can be air-cooled with any bearing configuration.

In response to ever-demanding performance requirements of modern machinery, GE achieved a substantial improvement in performance with a bearing that features an optimal internal geometry, ultra clean contact surface finish, and high quality homogenous steel formed through a unique heat treatment.



## Custom motors built fast

GE is constantly making improvements in component and manufacturing standardization. The Ultra Series TEFC and WPI designs use many of same components and all make use of proven XSD Ultra electrical designs. This enables us to deliver custom motors to you very fast.

Fans, couplings, end shields, bearings, bearing caps, and flanges are shared across designs resulting in some of the fastest custom cycle times in the industry.

# All pump motors are not built the same!

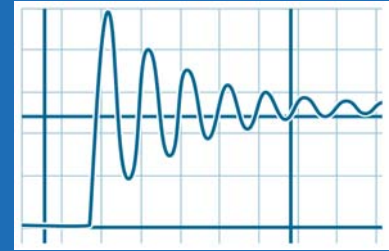


## Effects of VFD's on Induction Motors

When the motor impedance is greater than the impedance of the conductor cable between the motor and the drive, the voltage waveform will reflect at the motor terminals. Longer motor cables favor higher amplitude standing waves.

Voltage spikes have occurred with peak values as high as 2,150 volts (V) in a 480V system operating at 10% overvoltage.

These high spikes can lead to insulation breakdown, which results in phase-to-phase or turn-to-turn short circuits, and subsequently overcurrent drive sensor trips.

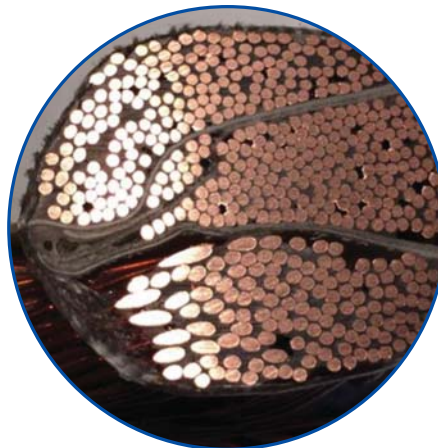


Source: US Department of Energy, Advanced Manufacturing Office, Energy Efficiency and Renewable Energy



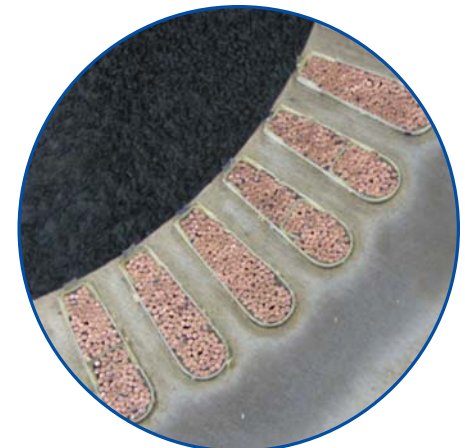
### Rotational Varnish Application

All low voltage motor coils are rotationally varnished with a "Trickle Treat" process while an electric current is passed through the windings to ensure a penetrating, thorough and even coating. This proven process fills air gaps that could cause corona inception damage during operation.



### Wire Bonding

The varnish resin penetrates deep into tightly packed coil wire creating a strong bond that guards against end-turn vibration.

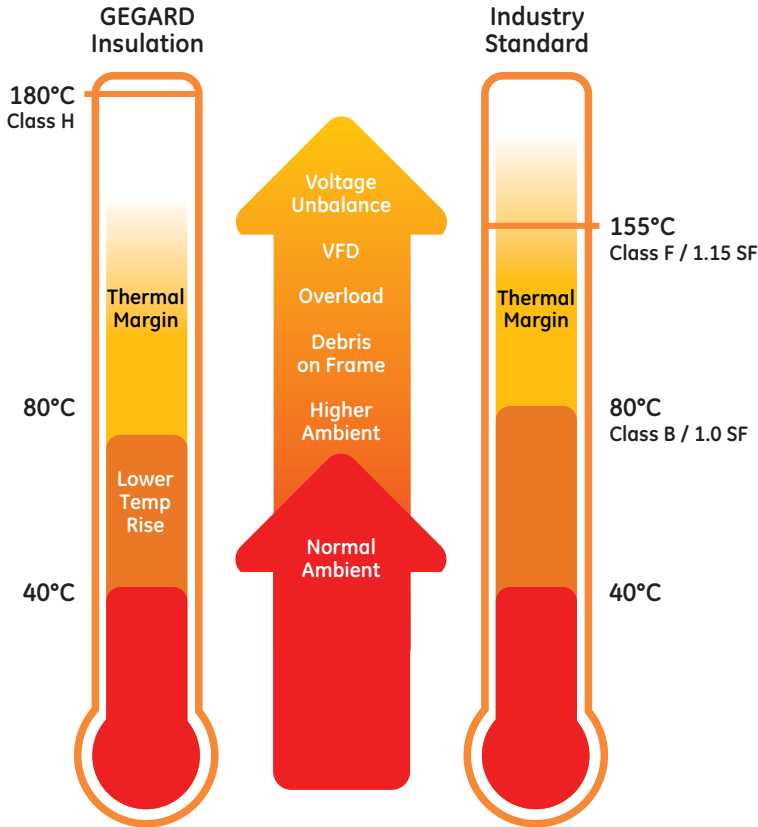


### Protection from Contamination

Moisture and contaminant accumulation becomes less of an issue with carefully and tightly packed stator coils bonded by deep resin penetration into the slots.

Insulation Comparison	GE	Alternative
Varnish Application Process 140 to 445 Frame	Trickle Treat	Dip and Bake
Air Void Formation	Less	More
Moisture Accumulation	Less	More
Contaminant Accumulation	Less	More
Corona Inception Damage	Less	More
Wire Bonding	Solid Encapsulation	Brittle / Loose
Coil Winding End Turn Vibration	Less	More
Resin Distribution	Even / High Penetration	Uneven / "Icicles"

# Engineered for reliability.



## GEGARD™ Insulation offers added protection in severe applications.

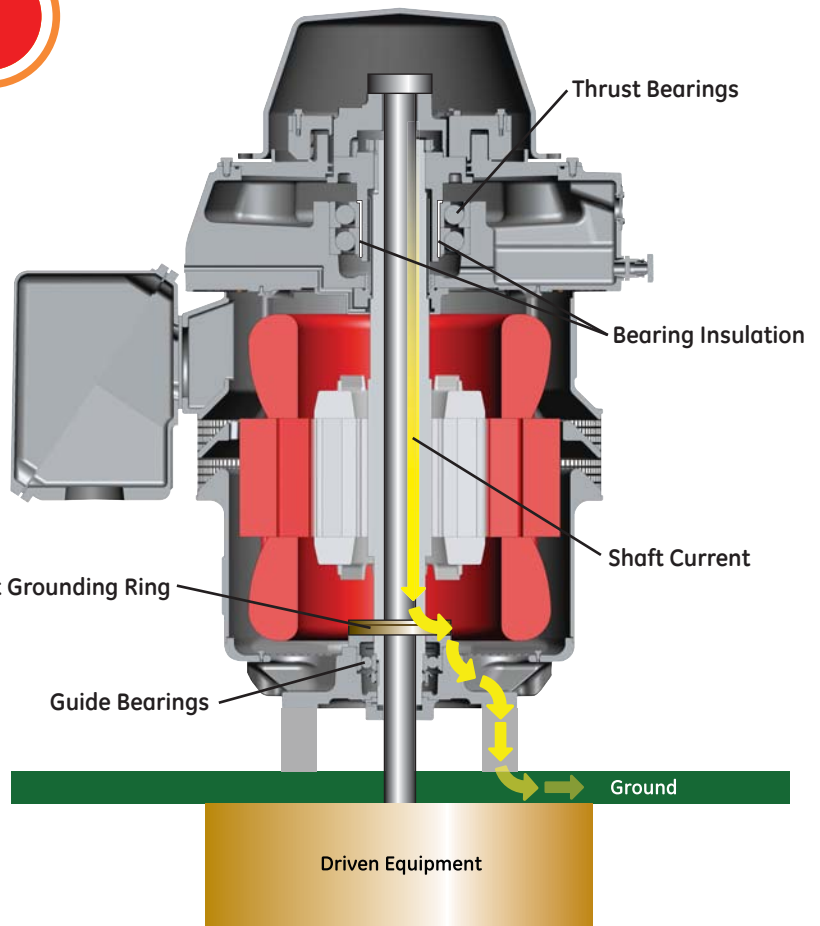
Heat is the primary enemy of electric motors. The most common causes of motor failure are overheating coils and bearings. Our Class H GEGARD insulation system is designed to run lower than a standard temperature rise of 80 degrees Celcius. Often, existing application conditions drive up the operating temperature of the motor to exceed acceptable standard levels. That's why its critical to have a large thermal margin to handle multiple application challenges.

**Larger Thermal Margin  
= Longer Motor Life**

## Guarding against voltage spikes and bearing fluting.

Another common cause of motor failure is shaft currents that build up during normal operation. These currents create voltage spikes that reach thrust and guide bearings causing them to vibrate in operation. Over a short period, this vibration (fluting) will degrade bearings to the point of failure.

To divert shaft currents from bearings and driven equipment, we include insulation for the thrust bearings in ratings 100HP+ and Aegis™ shaft grounding rings are optional on all ratings.

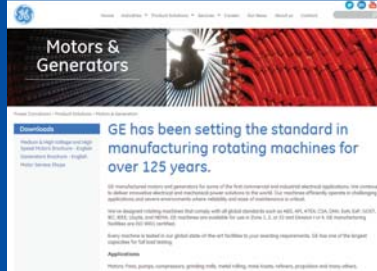




# Working with GE has never been easier!

## GE Motor Website

The latest information on custom and standard rotating machines.



## GE Motor e-Catalog

GE motors on your computer. Auto-update online. Can be viewed offline.



## GE Motors & Generators Store

Find a distributor. Download data packs. Access support library.



## LV/MV TEFC Manufacturing

Monterrey, Mexico  
Employs over 500 people.  
ISO9000-2008 facility  
YouTube Virtual Tour



[www.gepowerconversion.com](http://www.gepowerconversion.com)

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