

GE Energy Connections  
Power Conversion



# Low Voltage Motors

AC/DC

1-1000 HP

0.75-750 kW

Durability, Reliability and Efficiency at the Heart of Industrial Operations

# Small Machines Make A Big Impact

INDUSTRIAL PROCESSING COST SAVING CHALLENGE

Electric motors make  
an average of

**70%**

total power cost\*

**\$87k** /Hour

Average cost of  
unplanned downtime for  
a typical industrial processing plant\*\*

Multiple suppliers, designs and specifications tying up resources.

Frequent unplanned maintenance disrupting operations requiring replacement motors onsite.

Older low efficient motors eating profits.

# Higher Efficiency and Less Downtime

GE SOLUTION

**\$930k** /Year

Energy savings  
uncovered during  
a plant motor audit  
and resulting frame agreement\*\*\*

Frame agreements increase supply and specification efficiency freeing up resources.

Less unplanned maintenance and downtime with more robust motor designs.

**1%+** energy efficiency gains translates to less than two year payback.

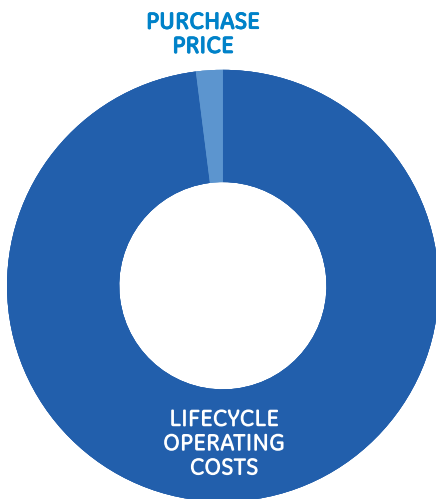
# Application Considerations

## TOTAL COST OF OWNERSHIP

### CONSIDER LIFECYCLE OPERATING COSTS FIRST

The initial cost of an electric motor makes up 5% or less of the total cost of operation. So all aspects of the motor operation should be considered when purchasing motors.

- Energy Consumption
- Efficiency
- Ease of Maintenance
- Reliability
- System Criticality
- Lifecycle
- Environmental Impact



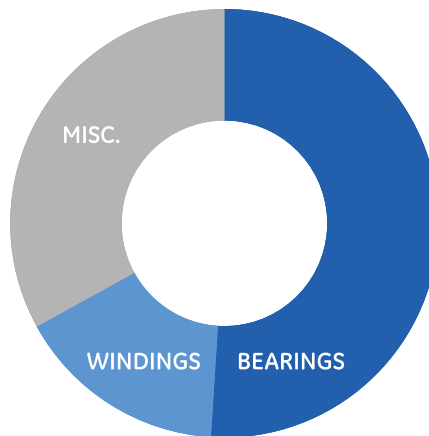
### WE ADDRESS THE MOST COMMON REASONS FOR MOTOR FAILURE

#### BEARINGS

- Heat
- Contamination
- Vibration
- Misalignment
- Lubrication Issues
- Electrical Discharge
- Stress, Load, Fatigue

#### STATOR WINDINGS

- Heat
- Load
- Inverters
- Contamination
- Voltage Issues



### COMMON INDUSTRIAL APPLICATION REQUIREMENTS

Each petroleum, chemical, power generation, pulp/paper, mining, metal, mineral, water/wastewater, and general process application has unique torque, speed, voltage, enclosure, temperature, and industry standard requirements that must be designed into motors.



Pumps



Compressors



Blowers



Heat Exchangers



Mixers



Conveyors



Crushers



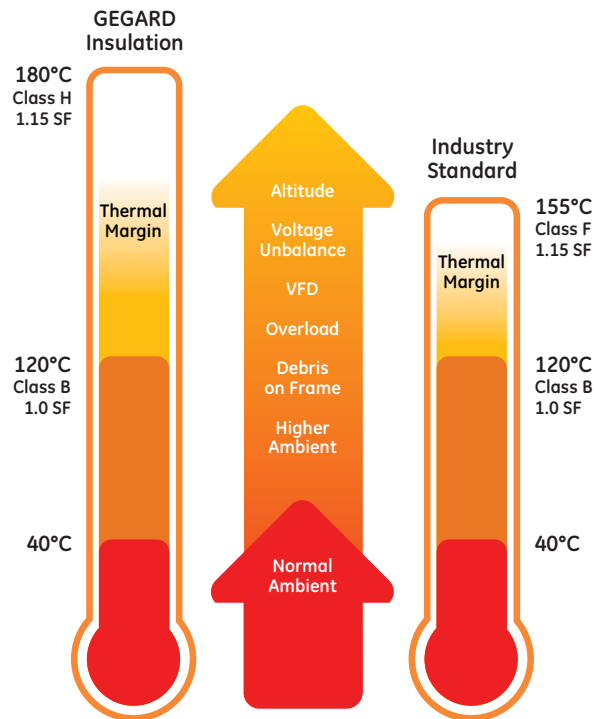
Augers

# Durable and Reliable Technology

ALL LOW VOLTAGE MOTORS ARE NOT BUILT THE SAME

## GEGARD™ INSULATION OFFERS ADDED PROTECTION IN SEVERE APPLICATIONS

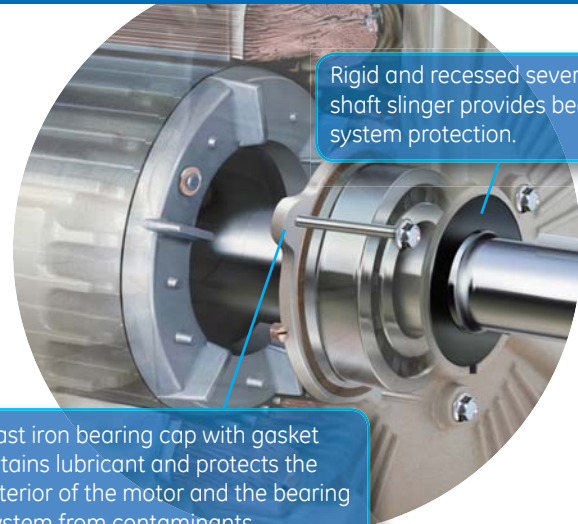
Our Class H GEGARD insulation system is designed to excel in variable frequency drive applications where lesser designs often short circuit and cause overcurrent trips.



Larger Thermal Margin = Longer Motor Life

## GUARDING AGAINST BEARING FAILURE

Common shaft currents create voltage spikes that reach bearings causing them to vibrate in operation. Over a short period, this vibration (fluting) will degrade bearings to the point of failure. We include bearing insulation for higher ratings and Aegis™ shaft grounding rings are optional on all ratings.



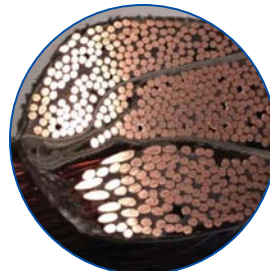
Rigid and recessed severe-duty shaft slinger provides bearing system protection.

Cast iron bearing cap with gasket retains lubricant and protects the interior of the motor and the bearing system from contaminants.



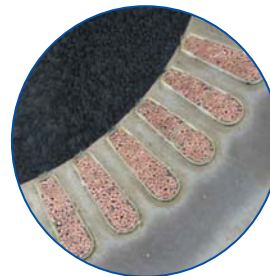
## ROTATIONAL VARNISH APPLICATION

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

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



## MOISTURE PROTECTION

Contaminants can't penetrate carefully and tightly packed stator coils bonded by deep resin penetration into the slots.

# Product Portfolio

RUGGED, RELIABLE AND EFFICIENT LOW VOLTAGE MOTORS

## SEVERE DUTY NEMA IE3

NEMA PREMIUM EFFICIENT



This versatile and robust design is ideal for a wide range of challenging industrial applications and environments.

### MODELS

- X\$D Ultra
- X\$D Ultra 841
- Energy \$aver

### TECHNICAL CAPABILITIES

0.75–300 HP, 900–3600 RPM  
230/460, 460, 575 V, Freq. 60 Hz  
Alternate 50 Hz data on nameplate  
TEFC (IP55) and ODP  
Frame sizes: 143T–449T  
NEMA, UL, CSA, IEEE 45, IEEE 841, IEEE 112B, GM 7E-TA  
Division 2 applications  
C-Face and high-torque  
Design “C” models available.  
VFD ready with GEGARD Class H (X\$D Ultra) or Class F (E\$) insulation  
Five (X\$D Ultra) or  
Three (E\$) Year Warranty

## SEVERE DUTY IEC IE3

RUGGED AND RELIABLE



Based on the X\$D Ultra mechanical and electrical design for the global market. Ideal for extreme environments.

### MODEL

- X\$D Ultra 841 IEC

### TECHNICAL CAPABILITIES

0.55–220 kW,  
750–3000/900–3600 RPM  
200 V, 400 V, 400/690, 690 V / 50 Hz  
230/460, 460, 575, 690 V / 60 Hz  
TEFC (IP55)  
Frame size: 90S–280H  
IEC, IEEE 841, IEEE 45, ATEX, and IEC Exn  
Zone II, ABS  
VFD ready with GEGARD Class H insulation  
Five Year Warranty

## EXPLOSION PROOF NEMA IE3

PROTECTS SYSTEMS IN  
HAZARDOUS ZONES



This enclosure has been specially designed to contain any sparking for hazardous environments where volatile gases may be present.

### MODEL

- X\$D Ultra XP

### TECHNICAL CAPABILITIES

1–300 HP, 900–3600 RPM  
230/460, 575 V, Freq. 60 Hz  
Alternate 50 Hz data on nameplate  
TEFC (IP55)  
Frame sizes: 182T–286T  
NEMA, UL, CSA, IEEE 112B  
Division 1, Class I - Groups C, D  
Class II - Groups F, G  
Five Year Warranty

## ADJUSTABLE SPEED NEMA

EXCELS IN CONSTANT TORQUE  
APPLICATIONS



Optimized performance in metal processing, plastic extrusion, winders, test stands, crane and hoist and material handling.

### MODEL

- A\$D Ultra

### TECHNICAL CAPABILITIES

1.5–300 HP, 1800 RPM  
230/460, 460, 575 V, Freq. 60 Hz  
TEFC, TEBC, TENV (IP55)  
Frame sizes: 143TC–449T  
NEMA, IEEE 841, IEEE 112B  
VFD ready with GEGARD  
Class H insulation  
Five Year Warranty

# Proven Technology

LARGE INSTALLED BASE IN EXTREME INVERTER-DUTY APPLICATIONS

## HEAT EXCHANGER NEMA IE3

STABLE, RELIABLE, EFFICIENT



Specially rated and ideally suited for harsh outdoor heat exchange applications.

### MODEL

- X\$D Ultra 661

### TECHNICAL CAPABILITIES

0.75–300 HP, 900–3600 RPM  
460, 575 V, Freq. 60 Hz  
TEFC (IP55)  
Frame sizes: 184T–449  
NEMA, UL, CSA, API 661, IEEE 841, IEEE 45, GM 7E-TA, IEEE 112B  
CE, ATEX Zone 2  
Division 2 application  
VFD ready with GEGARD  
Class H insulation  
Five Year Warranty

## VERTICAL PUMP NEMA IE3

INVERTER-DUTY AND EFFICIENT



Combines extra severe duty engineering with advanced thrust and cooling technologies.

### MODELS

- Ultra Series Vertical
- Large Custom Vertical

### TECHNICAL CAPABILITIES

3–1000HP, 600–3600 RPM  
460, 575, 2300/4160 V  
60Hz or 50Hz  
WPI and TEFC Enclosures  
Hollow and Solid Shaft  
Normal, High, and Extra High Thrusts  
Frame Size: 182–5013  
API 610 12th Edition  
P-Base mountings  
VFD ready with GEGARD  
Class H insulation  
Three Year Warranty

## MEDIUM VOLTAGE NEMA

SEVERE DUTY, LONG LASTING



Designed to operate in extreme Petrochemical, Power Generation, Mining and general process environments and applications.

### MODELS

- Quantum LMV
- Ultra Series MV

### TECHNICAL CAPABILITIES

100–800 HP, 900–3600 RPM,  
460, 575, 2300/4000 V, Freq. 60 Hz  
TEFC  
Available in IEEE 841 config.  
Frame sizes: 444–5013  
NEMA, CSA, IEEE 112B, AEx nA  
API 547 and 541, Division 2, Zone 2  
Class F insulation  
Three Year or  
Five Year Warranty (IEEE 841)

## DIRECT CURRENT

RELIABLE WORKHORSES



A reliable lifeline to driven equipment and backbone for production and operation.

### MODELS

- Kinamatic
- CD6000 Series
- Mill Duty

### TECHNICAL CAPABILITIES

1–500 HP, 300–3600 RPM  
Armature voltage: 180, 240, 500  
Field voltage: 300/150, 240/120  
DPFG, DPFG-BV, TE,  
Explosion proof  
TREC coils on large frames  
Two Year Warranty  
**(CD6000 Series)**  
500–2000 HP, 300–1750 RPM  
Armature voltage: 500, 600  
**(Mill Duty)**  
5–500 HP, 340–1025 RPM  
Armature & Field voltage: 230, 460  
Meets AIST standard

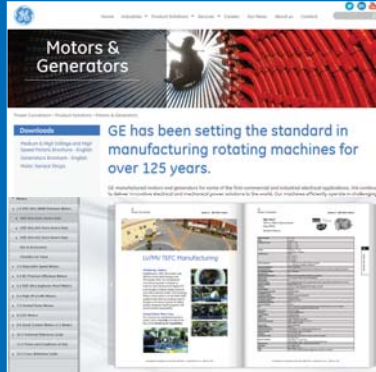
# Discover. Configure. Purchase.

## Website

The latest information on custom and standard rotating machines.

## e-Catalog

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



Search  
**Google**<sup>™</sup>  
"GE Motors"

## PC Store

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



Search  
**Google**<sup>™</sup>  
"GE Motor Store"

## Manufacturing

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



**You Tube**  
"Monterrey  
AC Capabilities"

## Services

### CARING FOR YOUR NEEDS

At GE, we understand that the goals of your organization are demanding, and evolving. To help you meet these goals here at GE Power Conversion we provide a service that goes beyond just waiting for your call.

We offer a comprehensive range of aftermarket services including replacement units, field services, spares, service agreements, unit upgrades and technical support. Our mission is to satisfy our customers aftermarket needs.

### INSTALLATION & COMMISSIONING

Installing with confidence. Our team of field service engineers are on hand to ensure your assets go into active service functioning efficiently.

### TRAINING PROGRAMS

Through our in-depth training modules we provide our customers with the knowledge and skills to operate and maintain equipment in the field.

### ENHANCED TECHNICAL SUPPORT

We offer enhanced technical support to customers with service agreements. Our enhanced technical support agreements are designed to suit your specific needs including the availability of 24/7 on-call technical assistance, remote support and immediate mobilization to emergencies.

### SPARES AND CONSUMABLES

The GE Parts team is available to advise the appropriate spares and consumable parts for you to hold in stock. For those emergencies - the team will provide the parts you need on time and at the quality you expect.

### DIAGNOSTICS AND SPECIALIZED

Delivering state of the art test and diagnostic services, our specialist field engineers will apply our in house analysis tools to analyse the asset's performance. Working with you to resolve issues on installations in the field efficiently and reliably.

### UNIT UPGRADES

To extend the life of your asset, our engineering design team will provide you with suitable upgrade options aligned to meet your technical specification and requirements to improve



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

GE, Ultra, A5D Ultra, X5D Ultra, GEGARD, Quantum, Polysel, TREC, and the Six Star Bearing System are trademarks of General Electric Company.  
NEMA Premium is a trademark of NEMA.

\* <http://energy.gov/eere/amo/downloads/optimizing-your-motor-driven-system>

\*\* <https://iac.university/technicalDocs/prodman.pdf> (Page 67)

\*\*\* Large pulp and paper producer motor audit results 2014

©2017, General Electric Company. All rights reserved.

GEA17491G-EN (2/2017)