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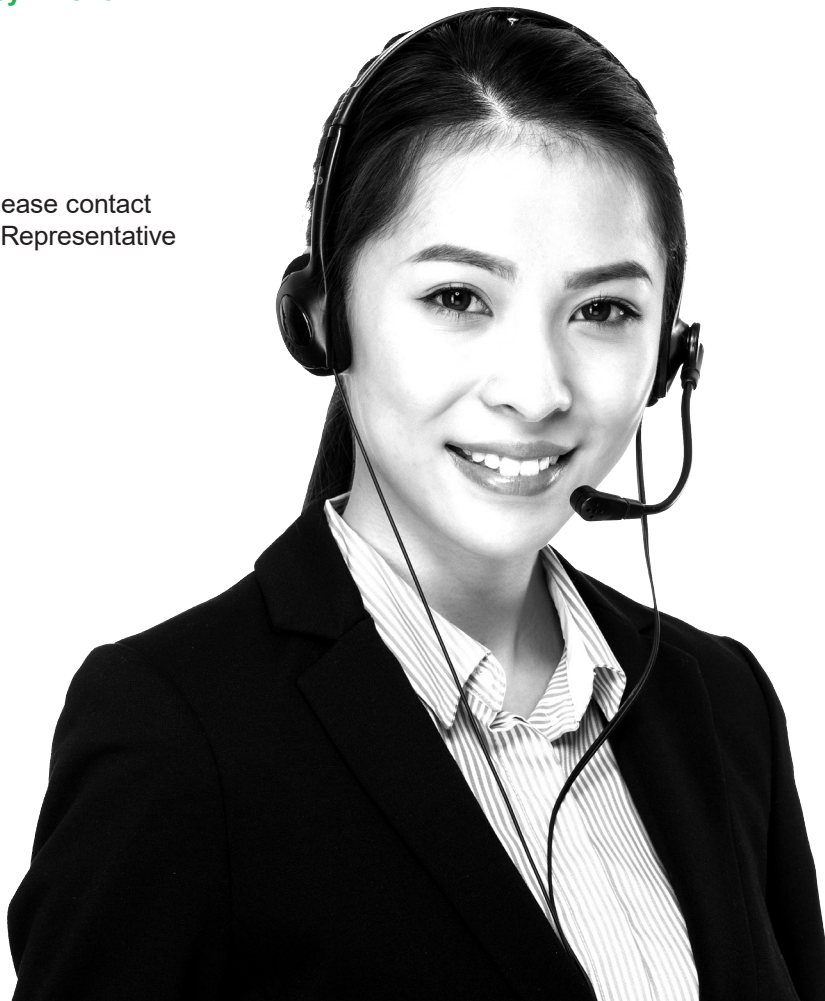
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THREE PHASE MODIFIABLE NEMA^{®†} HORIZONTAL MOTORS

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NIDEC MOTOR CORPORATION

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 - Additional Inverter / Vector Ratings
 - Expanded Cooling Tower Duty Ratings
 - Additional Washdown Ratings
 - 661 PLUS® Motors
 - Horizontal Custom and Stock List Pricing Are Now Aligned For All Products
 - Complete and Comprehensive Accessories & Modifications Section
 - Detailed Options Descriptions
 - Expanded Multi-Speed Offering
 - Competitive Inverter Duty Hazardous Location Pricing
-

IMPORTANT INFORMATION

Nidec Motor Corporation has made every effort to ensure the integrity of the contents of this catalog. However, Nidec Motor Corporation cannot accept responsibility for errors, that may have been caused by changing model/catalog numbers, or for typographical or clerical errors in the preparation of this catalog. The motor data and dimensions are provided are for reference only. Certified dimensions and performance data will be furnished upon request. Prices are subject to change without notification.

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General Information for Integral Horsepower (IHP) Motors on Variable Frequency Drives (VFDs)

Variable Frequency Drives (VFD)

A VFD is a type of controller used to vary the speed of an electric motor. The VFD takes a fixed AC voltage and frequency and allows it to be adjusted in order to get different speeds from the motor. Motor speed can be varied by changing the frequency of the input power waveform. The equation below shows how the frequency affects the speed of a three phase induction motor.

$$\text{Speed} = \frac{120 * \text{Fundamental Input Frequency}}{\text{Number of Motor Poles}}$$

How does a VFD work?

A VFD takes the fixed frequency and voltage sine wave from the power grid or power station and puts it through a few steps in order to allow the VFD user to vary the frequency and in turn control the motor speed. First it rectifies the AC power into DC Power. Because of this step, a term commonly used instead of VFD is inverter. This only describes one step of what the VFD does to the power waveform. Once rectified into a DC voltage the drive sends the power through a set of transistors or switches. These switches can take the DC waveform and by opening and closing at certain speeds and durations can create an output waveform that mimics the sine wave that is required to drive a three phase electric motor. The output wave form is known as a Pulse Width Modulation (PWM) waveform because the waveform is created by multiple pulses of the switches at short intervals.

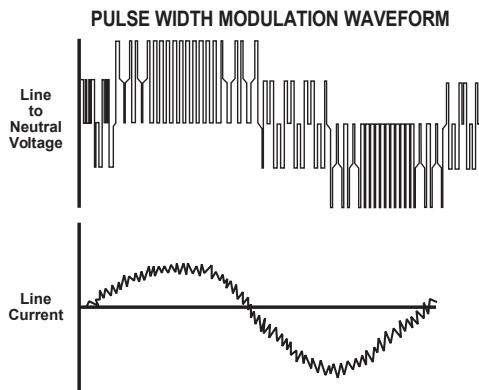


Figure 1 PWM Waveform

What variables should be considered when deciding whether to power a motor with a VFD?

VFD compatibility with motors is complex. As a result, many variables must be considered when determining the suitability of a particular motor for use with a VFD. These variables include:

- Torque requirements (Constant or Variable)
- Speed Range
- Line / System Voltage
- Cable length between the VFD and the motor
- Drive switching (carrier) frequency
- Motor construction
- VFD dv/dt - winding end turn differential in voltage versus differential in time
- High temperatures or high humidity

- Grounding system

Wider speed ranges, higher voltages, higher switching frequencies, insufficient grounding and increased cable lengths all add to the severity of the application and, therefore, the potential for premature motor failure.

How does a VFD affect the motor?

There are many things to consider when a motor is powered using a VFD or PWM power. When a motor is powered by a PWM waveform the motor windings very often see a large differential voltage, either from phase to phase or turn to turn. When the voltage differential becomes large enough it creates a reaction at the molecular level that converts available oxygen into O₃. This phenomenon is called partial discharge or corona. This reaction creates energy in the form of light and heat. This energy has a corrosive effect on the varnish used to protect the motor windings. PWM waveforms can also magnify shaft voltages which lead to arcing across the bearing and causing premature bearing failure. Corrective action must be taken to mitigate these issues that arise when using an electric motor with a VFD.

How do I protect the motor?

Nidec Motor Corporation (NMC) has developed specific motor designs to decrease the harmful affects that a VFD can have on a motor. NMC's INVERTER GRADE[®] insulation system is the first line of defense against corona and phase to phase faults that can be common when a motor is powered using a PWM waveform. The INVERTER GRADE[®] insulation system is standard on all of NMC's Inverter Duty products. Along with the INVERTER GRADE[®] insulation, thermostats are installed as a minimum protection against over heating the motor. Special consideration must also be given to bearings in motors powered by VFD's. In order to create a low resistance path to ground for built up shaft voltages a shaft grounding device can be used. On larger horsepower motors an insulated bearing system should be used in conjunction with the shaft grounding device when installed, to force the stray shaft voltages to ground. The bearing failures are more prominent on motors with thrust handling bearings. NMC has created an Inverter Duty vertical motor line that not only uses the INVERTER GRADE[®] insulation system, but that also comes standard with a shaft grounding device. On motors that are 100 HP and greater the thrust bearing is also insulated for additional protection.

What does "Inverter Duty" mean?

An Inverter Duty motor should describe a motor that helps mitigate potential failure modes of a motor that is powered by a VFD. Inverter duty motor windings should be able to withstand the voltage spikes per NEMA MG1 Part 31.4.4.2 and protect against overheating when the motor is run at slow speeds. On thrust handling bearings it is apparent that the bearings require additional protection. Inverter Duty vertical motors should have a shaft grounding device to protect the motor bearings from fluting due to voltage discharge through the bearing. On larger motors (100HP and larger) the shaft should also be electrically isolated from the frame in order to aid the shaft grounding ring in discharging the shaft voltages to ground.

Motor / Inverter Compatibility

Thermal Overloads and Single Phase Motors

Motors with thermal overloads installed may not operate properly on a VFD. The current carrying thermal overload is designed for sine wave power. Operation on a VFD may cause nuisance tripping or potentially not protect the motor as would be expected on line power. Thermostats or thermistors installed in the motor and connected properly to the VFD may provide suitable thermal overload protection when operating on a VFD. (consult codes for installation requirements)

Single phase motors and other fractional horsepower ratings are not designed to be operated on a VFD. Within Nidec Motor Corporation standard products, all motors NEMA®† 48 frame (5.5" diameter) and smaller are not suitable for VFD applications. Three phase 56 and 143/145 frame applications should be noted on the catalog price page; or if in doubt ask an Nidec Motor Corporation technical representative for recommendations on compatibility with a VFD.

Slow Speed Motors

Motors with a base design of slower than six poles require special consideration regarding VFD sizing and minimizing harmonic distortion created at the motor terminals due to cable installation characteristics. Additional external PWM waveform filters and shielded motor cables designed for PWM power may be required to provide acceptable motor life. Harmonic distortion on the output waveform should be kept to a minimum level (less than 10%) mismatch impedance.

690V Applications

Motors that are rated for 690VAC and that will be powered by 690VAC PWM VFDs require the use of an external filter to limit peak voltage spikes and the use of an INVERTER GRADE® motor. Where available, an alternative to using an output filter is to upgrade to a 2300V insulation system.

Low Voltage TITAN® Motors

When using 449 frame and larger motors on PWM type VFDs consider the use of an external filter and shielded motor cables designed for PWM power to minimize harmonic distortion and peak voltages at the motor terminals. Harmonic distortion on the output waveform should be kept to a minimum level (less than 10%).

Bearing Currents Related to PWM Waveforms

Protection of the motor bearings from shaft currents caused by common mode voltages is becoming a standard feature on Inverter Duty motor products. Some installations may be prone to a voltage discharge condition through the motor bearings called Electrical Discharge Machining (EDM) or fluting. Vertical HOLLOSHAFT and HOSTILE DUTY World Motor come with grounding devices installed as standard. EDM damage is related to characteristics of the PWM waveform, and the VFD programming, and installations factors.

Bearing Protection on Inverter Duty Vertical Motors

All U.S. MOTORS® brand "Inverter Duty" vertical products have a shaft grounding system that allows damaging shaft currents a low resistance path to ground. Bearings on vertical motors fed by VFD power without this bearing protection are not covered under any warranty. All other bearing failure is covered per NMC's standard warranty. An electric motor repair shop approved to service U.S. MOTORS® brand motors must verify that the cause of the bearing failure was not due to EDM damage.

Guideline For Insulated Anti-Friction Bearings

Bearing insulation is required to prevent circulating shaft currents which can damage bearings. Circulating shaft current can be caused by use of improper power and/or ground cables, improper grounding systems and higher switching frequencies. Finding and correcting the external condition(s) is the responsibility of the system designer or specifying engineer. To prevent circulating shaft current in motors with anti-friction bearings, Nidec Motor Corporation's standard practice is to insulate the non-drive end bearing.

Adjustable Speed Drives produce a common mode voltage condition. To interrupt common mode voltage on induction motors of all sizes, NEMA MG1-2018 Part 31 recommends insulating both bearings. In cases where both anti-friction bearings are insulated, the system designer or specifying engineer should determine whether to apply one or more of the following options to

prevent or reduce shaft currents: sinewave filters, line reactors or mechanical devices, such as shaft grounding or an insulated half coupling. Motors with shaft grounding devices are not suitable for installation in hazardous locations unless housed in an enclosure suitable for the specified Division (or Zone), Class and Group(s).

Multiple Motors on a Single VFD

Special considerations are required when multiple motors are powered from a single VFD unit. Most VFD manufacturers can provide guidelines for proper motor thermal considerations and starting/stopping of motors. Cable runs from the VFD and each motor can create conditions that will cause extra stress on the motor winding. Filters may be required at the motor to provide maximum motor life.

Grounding and Cable Installation Guidelines

Proper output winding and grounding practices can be instrumental in minimizing motor related failures caused by PWM waveform characteristics and installation factors. VFD manufacturers typically provide detailed guidelines on the proper grounding of the motor to the VFD and output cable routing. Cabling manufacturers provide recommended cable types for PWM installations and critical information concerning output wiring impedance and capacitance to ground.

Vertical Motors on VFDs

Vertical motors operated on VFD power present unique conditions that may require consideration by the user or installation engineer:

- Locked rotor and drive tripping caused by non-reversing-ratchet operation at low motor speeds. It is not recommended to operate motors at less than 1/4 of synchronous speed. If slow speeds are required contact NMC engineering.
- Unexpected / unacceptable system vibration and or noise levels caused by the torque pulsation characteristics of the PWM waveform, a system critical frequency falling inside the variable speed range of the process or the added harmonic content of the PWM waveform exciting a system component
- Application related problems related to the controlled acceleration/deceleration and torque of the motor on VFD power and the building of system pressure/load.
- The impact the reduction of pump speed has on the down thrust reflected to the pump motor and any minimum thrust requirements of the motor bearings
- Water hammer during shutdown damaging the non-reversing ratchet

Humidity and Non-operational Conditions

The possible build-up of condensation inside the motor due to storage in an uncontrolled environment or non-operational periods in an installation, can lead to an increased rate of premature winding or bearing failures when combined with the stresses associated with PWM waveform characteristics. Moisture and condensation in and on the motor winding over time can provide tracking paths to ground, lower the resistance of the motor winding to ground, and lower the Corona Inception Voltage (CIV) level of the winding.

Proper storage and maintenance guidelines are important to minimize the potential of premature failures. Space heaters or trickle voltage heating methods are the common methods for drying out a winding that has low resistance readings. **Damage caused by these factors are not covered by the limited warranty provided for the motor unless appropriate heating methods are properly utilized during non-operational periods and prior to motor start-up.**

NEMA®† Application Guide for AC Adjustable Speed Drive Systems:
<http://www.nema.org/stds/acadjustable.cfm#download>

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Warranty Guidelines for Integral Horsepower (IHP)* Motors on Variable Frequency Drives

Warranty Guidelines

The information in the following section refers to the motor and drive application guidelines and limitations for warranty.

Hazardous Location Motors

Use of a variable frequency drive with the motors in this catalog, intended for use in hazardous locations, is only approved for Division 1, Class I, Group D hazardous location motors with a T2B temperature code, with a limitation of 2:1 constant torque or 10:1 variable torque output. **No other stock hazardous location motors are inherently suitable for operation with a variable frequency drive.** If other requirements are needed, including non-listed Division 2, please contact your Nidec Motor Corporation territory manager to conduct an engineering inquiry.

575 Volt Motors

575 volt motors can be applied on Inverters when output filters are used. Contact the drive manufacturer for filter selection and installation requirements.

Applying INVERTER GRADE® Insulated Motors on Variable Frequency Drives (2, 4, 6 pole)

The products within this catalog labeled "Inverter Duty" or "Vector Duty" are considered INVERTER GRADE® insulated motors. INVERTER GRADE® motors exceed the NEMA® MG-1 Part 31 standard. Nidec Motor Corporation provides a three-year limited warranty on all NEMA® frame INVERTER GRADE® insulated motors and allows long cable runs between the motor and the VFD (limited to 400 feet without output filters). Cable distance can be further limited by hot and humid environments and VFD manufacturers cable limits. These motors may be appropriate for certain severe inverter applications or when the factors relating to the end use application are undefined (such as spares).

Nidec Motor Corporation's U.S. Motors® brand is available in the following INVERTER GRADE® insulated motors:

- Inverter Duty NEMA® frame motors good for 20:1 Variable Torque & 5:1 Constant Torque, including Vertical Type RUSI (10:1 V.T.)
- Inverter Duty motors rated for 20:1 Constant Torque
- ACCU-Torq® and Vector Duty Motors with full torque to 0 Speed or 5000:1
- 841 Plus® NEMA® Frame Motors

Applying Premium Efficient motors (that do not have INVERTER GRADE® insulation) on Variable Frequency Drives (2, 4, 6 pole)

Premium efficient motors without INVERTER GRADE insulation meet minimum NEMA® MG-1, Section IV, Part 31.4.4.2. These motors can be used with Variable Frequency Drives (with a reduced warranty period) under the following parameters:

- On NEMA® frame 447 and smaller motors, 20:1 speed rating on variable torque loads & 4:1 speed range on constant torque loads.
- On TITAN® 449 and larger frame motors, 10:1 speed rating on variable torque loads.
- On TITAN® frame motors, inquiry required for suitability on constant torque loads.

Cable distances are for reference only and can be further limited by hot and humid environments (refer to Table 1). Refer to specific VFD manufacturers cable limits. Refer to the Motor/ Inverter Compatibility page for special consideration of vertical motor bearings.

Table 1 - Cable Distances			
Maximum Cable Distance VFD to Motor			
Switching Frequency	460 Volt	230 Volt	380 Volt
3 KHz	127 ft	400 ft	218 ft
6 KHz	90 ft	307 ft	154 ft
9 KHz	73 ft	251 ft	126 ft
12 KHz	64 ft	217 ft	109 ft
15 KHz	57 ft	194 ft	98 ft
20 KHz	49 ft	168 ft	85 ft

Warranty Period Clarifications and Exceptions

Standard Energy Efficient Exclusion

Applying Standard & Energy Efficient Motors on Variable Frequency Drives is not recommended. VFD related failures on standard and energy efficient motors will not be covered under warranty.

Vertical Motor Windings

Premium efficient vertical motors without INVERTER GRADE® insulation that are installed using the criteria described in this document and applied in the correct applications shall have a warranty while powered by a VFD for 12 months from date of installation or 18 months from date of manufacturing whichever comes first. See limited warranty page for horizontal motor warranty periods.

Bearing Exclusion for Thrust Handling Bearings

Bearings used in premium efficient vertical motors, and all thrust handling bearings, that are powered by VFDs without shaft grounding devices or insulated bearings (when required) will not be covered under any warranty for damages caused from being powered by a VFD. All other bearing failure is covered per NMC's standard warranty. An electric motor repair shop approved to service U.S. MOTORS® brand motors must verify that the cause of the bearing failure was not due to Electrical Discharge Machining.

Warranty Exclusion

There is no warranty coverage for bearings on the 400 frame and larger motors used on Variable Frequency Drives, if shaft grounding is applied without insulation on the opposite drive end bearing on horizontal motors, or the upper bearing on vertical motors. An electric motor repair shop approved to service U.S. Motors® brand motors must verify that the cause of the bearing failure was not due to Electrical Discharge Machining.

Medium Voltage and Slow Speed Considerations

Motors that are rated above 700 VAC or that are eight pole and slower require special consideration and installation and are not covered under the warranty guidelines in this document. Motors that are rated above 700VAC have special cable length and voltage differential issues that are specific to the VFD type and manufacture. The motor construction and cost may vary dramatically depending on the VFD topology and construction. Contact your NMC representative with VFD manufacturer name and model type for application and motor construction considerations. Motors that are designed eight pole and slower also require special installation and filters per the drive manufacturer.

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Agency Approvals

ISO9001:2015 Certified

By British Standards Institute of America

CSA International (CSA®†)

Formerly the Canadian Standards Association

CSA®† sets safety standards for motors and other electrical equipment used in Canada. The motors that meet the CSA®† standards display the CSA®† logo on the nameplate or display the  logo (indicating evaluation to CSA standards by UL).

UL LLC (UL®†)

Formerly Underwriters Laboratories, Inc

UL®† is an independent testing organization that sets safety standards for motors and other equipment and U.S. Motors® brand are UL®† component recognized.

United States Department of Energy

All motors within this catalog that are required to comply with the United States Department of Energy's Efficiency regulation 10 CFR Section 431 Subpart B – electric motors, display the compliance certification number CC030A on the motor nameplate. Motors within the scope of 10CFR Section 431 Subpart X meet the requirements.

Conformité Européenne European Community (CE Certification)

The CE marking indicates that the product complies with the essential requirements for health, safety, environmental and consumer protection. The CE mark can only to non-hazardous location motors rated 1000 volts or less, frame 180 through 449, Dripproof and Totally Enclosed Fan Cooled enclosures. Many Nidec Motor Corporation motors can have the CE logo applied. For information on CE logo availability, contact your Nidec Motor Corporation representative.

UL®† & CSA®† Listings

	UL®†	CSA®†
	IHP	IHP
General Construction	E51488	191252
Hazardous Location	E10336	
Thermal Protection	E38946	
Fire Pump	EX5189	-
Electronic Protection ¹	-	-
Energy Efficiency Verified ²	E51488	-

*For details on VFD for these motors, refer to Suitability of IHP Motors on Variable Frequency Drives (VFD), page vii.

¹  marked indicating evaluation for UL and CSA standards

² Verification for US DOE 10CFR Section 431 Subpart B and Natural Resources Canada C390

³ Fire Pump certification appears in conjunction with UL and CSA



Limited Warranty

Refer to usmotors.com website for the most up-to-date warranty information.

All Nidec Motor Corporation products shall carry the limited warranty of 12 months from the date of installation, not to exceed 18 months from date of manufacture as specified in Section 5 of the Nidec Motor Corporation's Terms and Conditions of Sale except those specifically listed below, or noted within individual product family pages within this catalog.

	Installed / Manufactured	Installed / Manufactured
Industrial Motors 140 - 447 Frames	Sine Wave Power	VFD Power
Epact	18 / 24 months	12 / 18 months
Vertical Standard / Energy (Epact) Efficient	18 / 24 Months	Not Covered
NEMA ^{®†} Premium	36 / 42 months	24 / 30 months
Vertical NEMA ^{®†} Premium	36 / 42 Months	12 / 18 Months **
Inverter Duty	36 / 42 months	36 / 42 months
841 PLUS [®] & 661 PLUS [®]	60 / 66 months	36 / 42 Months
Auto Duty Premium Efficient	36 / 42 months	24 / 30 months
Single Speed NEMA ^{®†} Premium Efficient Cooling Tower	36 / 42 months	24 / 30 months
ACCU-Torq [®]	36 / 42 months	36 / 42 Months

Deferred & Extended Warranty Information

DEFERRED AND EXTENDED WARRANTIES (OPTIONAL WARRANTIES)

Deferred and extended warranties, defined as follows, apply only to 449 frame and larger horizontal and vertical motors, for use in the continental United States only. All optional warranties must be approved in writing by Nidec Motor Corporation. Contact Marketing for Approval.

Deferred Warranty

Nidec Motor Corporation's limited warranty, as set forth in the standard terms and conditions of sale, page xi, shall apply subject to the following modification: for a 5% addition to the net price of the motor ("Net Adder"), the warranty period on the motor will be for a period of one year (or more for applicable products) from that date of initial operation, but not in excess of 60 months from the date of shipment subject to the following conditions:

- That within thirty days prior to initial operation, a Nidec Motor Corporation (NMC) Service Engineer, or authorized NMC Service Station, be hired by the Buyer at Buyer's expense, to thoroughly inspect the motor to ascertain that the motor is in "as shipped" condition. This inspection will include but not be limited to:
 - Megger test of winding insulation.
 - Internal inspection to determine that the winding has not been damaged and that the motor is clean and dry.
 - Inspection of the bearings to determine they have not been damaged and there is no water in the oil reservoirs.
 - External inspection to determine that no damage has been made.
- Make any corrections which this inspection shows to be needed because the motor has been in storage or standing idle. These corrections will be made at Buyer's expense if corrections required are due to causes other than defects in material or workmanship.
- That an affidavit certifying that the motor has successfully passed the inspection and is in "as shipped" condition be supplied to NMC by Buyer. Failure to provide NMC with the affidavit certifying that the motor has passed inspection and is in "as shipped" condition will result in voiding the warranty.

Extended Warranty

When Buyer's specification requires a warranty period longer than the limited warranty set forth in Nidec Motor Corporation's standard terms and conditions of sale, page xi, the net price of each motor will be increased according to the schedule, which follows. Nidec Motor Corporation may accept an order with up to 60 months coverage.

From Mfg. Date	From Install	Net Adder
30 months	24 months	2%
42 months	36 months	3%
54 months	48 months	5%
66 months	60 months	6%

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NIDEC MOTOR CORPORATION

TERMS AND CONDITIONS OF SALE

Nidec Motor Corporation, referred to herein as the "Seller" and the customer or person or entity purchasing goods ("Goods") from Seller is referred to as the "Buyer." These Terms and Conditions, any price list or schedule, quotation, acknowledgment or invoice from Seller relevant to the sale of the Goods and all documents incorporated by reference herein or therein, constitute the complete and exclusive statement of the terms of the agreement governing the sale of Goods by Seller to Buyer. Seller's acceptance of Buyer's purchase order is expressly conditional on Buyer's assent to all of Seller's terms and conditions of sale, including terms and conditions that are different from or additional to the terms and conditions of Buyer's purchase order. Buyer's acceptance of or payment for the Goods will manifest Buyer's assent to these Terms and Conditions. Seller reserves the right in its sole discretion to refuse orders.

1. **PRICES:** Prices for Goods, whether specified in Seller's price list or schedule, acknowledgment or written quotation, are subject to change without notice. Such prices shall be adjusted to reflect Seller's prices for Goods as in effect at the time of requested shipment date, and each shipment will be invoiced at such prices. All prices are exclusive of taxes, transportation and insurance, which are to be borne by Buyer.

2. **TAXES:** Any current or future tax or governmental charge (or increase in same) affecting Seller's costs of production, sale, or delivery or shipment, or which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods, shall be for Buyer's account and shall be added to the price or billed to Buyer separately, at Seller's election.

3. **TERMS OF PAYMENT:** Unless otherwise specified by Seller, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. Seller shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Should Buyer's financial responsibility become unsatisfactory to Seller, cash payments or security satisfactory to Seller may be required by Seller for future deliveries and for the Goods theretofore delivered. If such cash payment or security is not provided, in addition to Seller's other rights and remedies, Seller may discontinue deliveries. Buyer hereby grants Seller a security interest in all Goods sold to Buyer by Seller, which security interest shall continue until all such Goods are fully paid for in cash, and Buyer, upon Seller's demand, will execute and deliver to Seller such instruments as Seller requests to protect and perfect such security interest.

4. **SHIPMENT AND DELIVERY:** While Seller will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by Seller, all shipping dates are approximate and not guaranteed. Seller reserves the right to make partial shipments. Seller, at its option, shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions and other required information. If the shipment of the Goods is postponed or delayed by Buyer for any reason, Buyer agrees to reimburse Seller for any and all storage costs and other additional expenses resulting therefrom. Each shipment is F.C.A. Seller's shipping point (Incoterms 2010). In accordance with the foregoing Incoterm, risk of loss for damage and responsibility for the Goods shall pass from Seller to Buyer for each shipment upon delivery to and receipt by carrier at Seller's shipping point and legal title to the shipped Goods shall transfer to Buyer for each shipment as and when risk of loss with respect to such shipment is transferred to Buyer. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by Buyer directly to the carrier. Shortages or damages must be identified and signed for at the time of delivery.

5. **LIMITED WARRANTY:** Subject to the limitations of Section 6, Seller warrants that the Goods manufactured by Seller, other than those specifically identified below, will be free from defects in material and workmanship and meet Seller's published specifications at the time of shipment under normal use and regular service and maintenance for a period of twelve (12) months from the date of shipment of the Goods by Seller or eighteen (18) months from the date of manufacture, whichever occurs sooner, unless otherwise specified by Seller in writing. Partial Motors of any kind not fully assembled by Seller shall carry no warranty of any kind, express or implied. Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. **THE WARRANTY SET FORTH IN THIS SECTION 5 AND THE WARRANTY SET FORTH IN SECTION 7, ARE THE SOLE AND EXCLUSIVE WARRANTIES GIVEN BY SELLER WITH RESPECT TO THE GOODS AND ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE.**

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence (other than Seller's), unauthorized modification or alteration, use beyond rated capacity, unsuitable power sources or environmental conditions, improper installation, repair, handling, maintenance or application or any other cause not the fault of Seller. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of Seller's quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after Buyer's discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option and as Buyer's exclusive remedy, repair, correct or replace or refund the purchase price for, that portion of the Goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects. Seller shall have the right to require the Buyer to deliver the Goods to Seller's designated repair center or manufacturing facility. All costs associated with dismantling, reinstallation and transportation to and from Seller's designated repair center or manufacturing facility and the time and expense of Seller's personnel and representatives for site travel and diagnosis under this warranty shall be borne by the Buyer. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from the date of shipment, whichever is longer. Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.

Section 5 applies to any entity or person who may buy, acquire or use the Goods, including any entity or person who obtains the Goods from Buyer, and shall be bound by the limitations therein, including Section 6. Buyer agrees to provide such subsequent transferee conspicuous, written notice of the provisions of Sections 5 and 6.

6. **LIMITATION OF REMEDY AND LIABILITY:** THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER (OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 7) SHALL BE LIMITED TO REPAIR, CORRECTION OR REPLACEMENT, OR REFUND OF THE PURCHASE PRICE UNDER SECTION 5.

SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND THE REMEDIES OF BUYER SET FORTH IN THIS AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use, revenue, reputation and data, costs incurred, including without limitation, for capital, fuel, power and loss of damage to property or equipment.

It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer's risk.

7. **PATENTS AND COPYRIGHTS:** Subject to the limitations of the second paragraph of Section 6, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer's specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of shipment. This warranty is given upon the condition that Buyer promptly notifies Seller of any claim or suit involving Buyer in which such infringement is alleged and cooperates fully with Seller and permit Seller to control completely the defense, settlement or compromise of any such allegation of infringement. Seller's warranty as to use patents only applies to infringement arising solely out of the inherent operation according to Seller's specifications and instructions (i) of such Goods, or (ii) of any combination of Goods acquired from Seller in a system designed by Seller. In the event such Goods are held to infringe such a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise or settlement by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods, or modify same to become non-infringing, or grant Buyer a credit for the depreciated value of such Goods and accept return of them. In the event of the foregoing, Seller may also, at its option, cancel the agreement as to future deliveries of such Goods, without liability. No license or rights in any of Seller's intellectual property associated with the Goods is granted hereby.

In the event that the Goods provided by Seller, as well as any services provided by Seller ("Services"), regardless of whether the Services are at the request or on behalf of Buyer, are part of a project ("Project"), or are performed alone or are related to the provision of Goods, contain or incorporate any work product, including but not limited to concepts, inventions (patentable or otherwise), works, drawings, designs, information, specifications, customizations, optimizations, improvements, documentation, and programs or software, in each case regardless of whether developed by Seller alone or with others, whether completed or work-in-progress, or whether completed at Buyer's request, Buyer's cost, or as part of a Project performed for Buyer (any and all of the foregoing being "Work Product"), Seller owns all right, title, and interest (including, but not limited to, any patents, copyrights, or other intellectual property rights) in such final Work Product, including any and all intermediate Work Product developed as part or in pursuit of the final Work Product, in connection with, embodied in, or encompassed by any Good, Service, or Project deliverable. Seller makes no transfer or license to Buyer of any right, title, or interest in or to the Work Product or in or to any of Seller's intellectual property or proprietary rights.

8. **EXCUSE OF PERFORMANCE:** Seller shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; strikes or labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries or other performance may be suspended for an appropriate period of time or canceled by Seller upon notice to Buyer in the event of any of the foregoing, but the balance of the agreement shall otherwise remain unaffected as a result of the foregoing.

If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth in the preceding paragraph, Seller may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or material) among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

9. **CANCELLATION:** Buyer may cancel orders only upon reasonable advance written notice and upon payment to Seller of Seller's cancellation charges which include, among other things, all costs and expenses incurred, and, to cover commitments made, by the Seller and a reasonable profit thereon. Seller's determination of such termination charges shall be conclusive.

10. **CHANGES:** Buyer may request changes or additions to the Goods consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price and dates of delivery. Seller reserves the right to change designs and specifications for the Goods without prior notice to Buyer, except with respect to Goods being made-to-order for Buyer. Seller shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

11. **NUCLEAR/MEDICAL.** UNLESS OTHERWISE AGREED IN WRITING BY SELLER: (i) GOODS SOLD HEREUNDER ARE NOT FOR USE IN CONNECTION WITH ANY NUCLEAR, MEDICAL, LIFE-SUPPORT AND RELATED APPLICATIONS, (ii) Buyer accepts Goods with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchasers or users and (iii) Buyer agrees to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

12. **ASSIGNMENT:** Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of Seller, and any such assignment, without such consent, shall be void.

13. **QUANTITY:** Buyer agrees to accept overruns of up to ten percent (10%) of the order on "made-to-order" goods, including parts. Any such additional items shall be priced at the price per item charged for the specific quantity ordered.

14. **REPLACEMENT / SERVICE GOODS:** Upon the cancellation or fulfillment of this order, Seller will have no obligation to sell and Buyer will have no obligation to purchase the Goods sold hereunder, including, but not limited to, the supply of replacement parts for Goods or Goods for Buyer's consumer service division. Seller is not obligated to sell Buyer or its consumer service divisions Goods: (i) for any fixed period of time after production of the Goods supplied hereunder ceases or after the last date of shipment made under this order; or (ii) at any pre-established price to fulfill Buyer's or its consumer service divisions requirements during or after production of the Goods ceases or after the last date of shipment under this order. Seller shall have the absolute right to revise the price of Goods and the terms of sale and to modify or discontinue the sale of the Goods, and such action shall not form the basis of any claim by Buyer against Seller.

15. **TOOLING:** Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interest in, or rights to possession or removal, or prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

16. **INSPECTION/TESTING:** Buyer, at its option and expense, may inspect and observe the testing by Seller of the Goods for compliance with Seller's standard test procedures prior to shipment, which inspection and testing shall be conducted at Seller's plant at such reasonable time as is specified by Seller. Any rejection of the Goods must be made promptly by Buyer before shipment. Tests shall be deemed to be satisfactorily completed and the test fully met when the Goods meet Seller's criteria for such procedures.

17. **DRAWINGS:** Seller's prints and drawings (including without limitation, the underlying technology) furnished by Seller to Buyer in connection with this agreement are the property of Seller and Seller retains all rights, including without limitation, exclusive rights of use, licensing and sale. Possession of such prints or drawings does not convey to Buyer any rights or license, and Buyer shall return all copies (in whatever medium) of such prints or drawings to Seller immediately upon request therefor.

18. **EXPORT/IMPORT:** Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which Goods may be supplied, will apply to their receipt and use. In no event shall Buyer use, transfer, release, import, export, Goods in violation of such applicable laws, regulations, orders or requirements.

19. **INSURANCE:** Seller shall carry adequate product liability and commercial general liability insurance. Seller shall, upon written request from Buyer, furnish Buyer with certificates of insurance confirming the existence of such insurance. Seller does not waive its, or its insurers', rights of subrogation.

20. **GENERAL PROVISIONS:** These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon the Seller unless made in writing and signed on its behalf by a duly authorized representative of Seller. No conditions, us age of trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification or additional terms shall be applicable to this agreement by Seller's receipt, acknowledgment, or acceptance of purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected and deemed a material alteration hereof. If this document shall be deemed an acceptance of a prior offer by Buyer, such acceptance is expressly conditional upon Buyer's assent to any additional or different terms set forth herein. No waiver by either party with respect to any breach or default or of any right or remedy, and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. All typographical or clerical errors made by Seller in any quotation, acknowledgment or publication are subject to correction.

The validity, performance, and all other matters relating to the interpretation and effect of this agreement shall be governed by the law of the state of Missouri without regard to its conflicts of laws principles. Buyer and Seller agree that the proper venue for all actions arising in connection herewith shall be only in Missouri and the parties agree to submit to such jurisdiction. No action, regardless of form, arising out of transactions relating to this contract, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Open Drip Proof (ODP)



DE, RE

Premium Efficient

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 56-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction
- * 56-250: Aluminum End Shields

- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 180 Frame And Up
- * Multi-Speed Available With Adder
- * Bearing Caps On 400 And 440 Frames
- * Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$472	143	\$443	143	\$595	143	\$686	-	-	-	-
0.33	143	\$472	143	\$443	143	\$595	143	\$686	-	-	-	-
0.5	143	\$472	143	\$443	143	\$595	143	\$686	-	-	-	-
0.75	143	\$472	143	\$443	143	\$595	145	\$686	-	-	-	-
1	143	\$472	143	\$443	145	\$595	182	\$686	184	\$926	215	\$1,204
1.5	143	\$472	145	\$466	182	\$600	184	\$833	215	\$1,124	254	\$1,461
2	145	\$515	145	\$512	184	\$672	213	\$1,119	215	\$1,510	256	\$1,963
3	145	\$529	182	\$544	213	\$855	215	\$1,435	254	\$1,937	284	\$2,518
5	182	\$564	184	\$586	215	\$1,122	254	\$1,840	256	\$2,483	286	\$3,228
7.5	184	\$880	213	\$857	254	\$1,423	256	\$2,340	286	\$3,159	324	\$4,107
10	213	\$1,029	215	\$1,043	256	\$1,851	284	\$2,776	324	\$3,747	326	\$4,871
15	215	\$1,414	254	\$1,426	284	\$2,363	286	\$3,648	326	\$4,924	364	\$6,402
20	254	\$1,711	256	\$1,829	286	\$2,880	324	\$4,316	364	\$5,827	365	\$7,575
25	256	\$2,237	284	\$2,214	324	\$3,163	326	\$5,113	365	\$6,902	404	\$8,973
30	284	\$2,637	286	\$2,629	326	\$3,629	364	\$5,667	404	\$7,651	405	\$9,946
40	286	\$2,883	324	\$2,889	364	\$5,786	365	\$7,020	405	\$9,477	444	\$12,320
50	324	\$3,243	326	\$3,386	365	\$6,506	404	\$8,364	444	\$11,291	445	\$14,678
60	326	\$4,469	364	\$4,657	404	\$7,706	405	\$9,698	445	\$13,092	445	\$17,019
75	364	\$5,886	365	\$5,514	405	\$8,764	444	\$11,665	445	\$15,748	447	\$20,472
100	365	\$6,500	404	\$6,571	444	\$10,274	445	\$16,450	447	\$22,208	449	\$28,870
125	404	\$8,706	405	\$8,743	445	\$11,097	447	\$17,081	449	\$23,059	449	\$29,977
150	405	\$10,743	444	\$11,431	445	\$14,949	447	\$19,272	449	\$26,017	-	-
200	444	\$13,917	445	\$14,286	447	\$19,649	449	\$20,581	-	-	-	-
250	445	\$18,343	445	\$16,151	447	\$22,343	449	\$27,838	-	-	-	-
300	445	\$25,362	447	\$21,169	449	\$27,315	-	-	-	-	-	-
350	447	\$29,028	447	\$28,679	-	-	-	-	-	-	-	-
400	449	\$34,056	449	\$33,647	-	-	-	-	-	-	-	-
450	-	-	449	\$35,963	-	-	-	-	-	-	-	-

* 60Hz 3600, 1800, 1200 & 900 RPM motors comply with U.S. D.O.E.'s Efficiency regulation 10 CFR Section 431 Subpart B – electric motors (See Appendix A2 & A3 for Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3MEO

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Open Drip Proof (ODP)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FD, FR

Energy Efficient

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 56-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction
- * 56-250: Aluminum End Shields

- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 180 Frame And Up
- * Multi-Speed Available With Adder
- * Bearing Caps On 400 And 440 Frames

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$425	143	\$399	143	\$536	143	\$617	-	-	-	-
0.33	143	\$425	143	\$399	143	\$536	143	\$617	-	-	-	-
0.5	143	\$425	143	\$399	143	\$536	143	\$617	-	-	-	-
0.75	143	\$425	143	\$399	143	\$536	145	\$617	-	-	-	-
1	143	\$425	143	\$399	145	\$536	182	\$617	-	-	-	-
1.5	143	\$425	145	\$419	182	\$540	184	\$749	-	-	-	-
2	145	\$464	145	\$461	184	\$605	213	\$1,007	-	-	-	-
3	145	\$476	182	\$490	213	\$770	215	\$1,291	-	-	-	-
5	182	\$508	184	\$527	215	\$1,010	254	\$1,656	-	-	-	-
7.5	184	\$792	213	\$771	254	\$1,281	256	\$2,106	-	-	-	-
10	213	\$926	215	\$939	256	\$1,666	284	\$2,498	-	-	-	-
15	215	\$1,273	254	\$1,283	284	\$2,127	286	\$3,283	-	-	-	-
20	254	\$1,540	256	\$1,646	286	\$2,592	324	\$4,101	-	-	-	-
25	256	\$2,013	284	\$1,993	324	\$3,005	326	\$4,857	-	-	-	-
30	284	\$2,373	286	\$2,366	326	\$3,448	364	\$5,384	-	-	-	-
40	286	\$2,595	324	\$2,745	364	\$5,497	365	\$6,669	-	-	-	-
50	324	\$3,081	326	\$3,217	365	\$6,181	404	\$7,946	-	-	-	-
60	326	\$4,246	364	\$4,424	404	\$7,321	405	\$9,213	-	-	-	-
75	364	\$5,592	365	\$5,238	405	\$8,326	444	\$11,082	-	-	-	-
100	365	\$6,175	404	\$6,242	444	\$9,760	445	\$15,628	-	-	-	-
125	404	\$8,271	405	\$8,306	445	\$10,542	447	\$16,227	-	-	-	-
150	405	\$10,206	444	\$10,859	445	\$14,202	447	\$18,308	-	-	-	-
200	444	\$13,221	445	\$13,572	447	\$18,667	449	\$19,552	-	-	-	-
250	445	\$17,426	445	\$15,343	447	\$21,226	449	\$26,446	-	-	-	-
300	445	\$24,094	447	\$20,111	449	\$25,949	-	-	-	-	-	-
350	447	\$27,577	447	\$27,245	-	-	-	-	-	-	-	-
400	449	\$32,353	449	\$31,965	-	-	-	-	-	-	-	-
450	-	-	449	\$34,165	-	-	-	-	-	-	-	-

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)
* For 720 Or 600 RPM, Use Standard Efficiency Or Premium Efficiency.

DISCOUNT SYMBOL: DS-3FM

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Three Phase Modifiable NEMA^{®†} Horizontal Motors Open Drip Proof (ODP)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



D, R

Standard Efficient

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 56-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction
- * 56-250: Aluminum End Shields

- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 180 Frame And Up
- * Multi-Speed Available With Adder
- * Bearing Caps On 400 And 440 Frames

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$378	143	\$354	143	\$476	143	\$549	-	-	-	-
0.33	143	\$378	143	\$354	143	\$476	143	\$549	-	-	-	-
0.5	143	\$378	143	\$354	143	\$476	143	\$549	-	-	-	-
0.75	143	\$378	143	\$354	143	\$476	145	\$549	-	-	-	-
1	143	\$378	143	\$354	145	\$476	182	\$549	184	\$741	215	\$963
1.5	143	\$378	145	\$373	182	\$480	184	\$666	215	\$899	254	\$1,169
2	145	\$412	145	\$410	184	\$538	213	\$895	215	\$1,208	256	\$1,571
3	145	\$423	182	\$435	213	\$684	215	\$1,148	254	\$1,549	284	\$2,014
5	182	\$451	184	\$469	215	\$898	254	\$1,472	256	\$1,987	286	\$2,583
7.5	184	\$704	213	\$686	254	\$1,138	256	\$1,872	286	\$2,527	324	\$3,696
10	213	\$823	215	\$834	256	\$1,481	284	\$2,220	324	\$3,372	326	\$4,384
15	215	\$1,131	254	\$1,141	284	\$1,890	286	\$2,918	326	\$4,432	364	\$5,762
20	254	\$1,369	256	\$1,463	286	\$2,304	324	\$3,885	364	\$5,244	365	\$6,818
25	256	\$1,790	284	\$1,771	324	\$2,847	326	\$4,602	365	\$6,212	404	\$8,076
30	284	\$2,110	286	\$2,103	326	\$3,266	364	\$5,101	404	\$6,886	405	\$8,952
40	286	\$2,306	324	\$2,600	364	\$5,207	365	\$6,318	405	\$8,529	444	\$11,088
50	324	\$2,919	326	\$3,047	365	\$5,855	404	\$7,527	444	\$10,162	445	\$13,210
60	326	\$4,022	364	\$4,191	404	\$6,935	405	\$8,728	445	\$11,782	445	\$15,317
75	364	\$5,297	365	\$4,963	405	\$7,888	444	\$10,498	445	\$14,173	447	\$18,425
100	365	\$5,850	404	\$5,914	444	\$9,247	445	\$14,805	447	\$19,987	449	\$25,983
125	404	\$7,835	405	\$7,869	445	\$9,987	447	\$15,373	449	\$20,754	449	\$26,980
150	405	\$9,669	444	\$10,288	445	\$13,454	447	\$17,345	449	\$23,415	-	-
200	444	\$12,525	445	\$12,857	447	\$17,684	449	\$18,523	-	-	-	-
250	445	\$16,509	445	\$14,536	447	\$20,109	449	\$25,054	-	-	-	-
300	445	\$22,826	447	\$19,052	449	\$24,584	-	-	-	-	-	-
350	447	\$26,125	447	\$25,811	-	-	-	-	-	-	-	-
400	449	\$30,650	449	\$30,282	-	-	-	-	-	-	-	-
450	-	-	449	\$32,366	-	-	-	-	-	-	-	-

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



UTE

UNIMOUNT® Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 56-140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts
- * Lifting Provisions On 180 Frame And Up

- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder
- * Rolled Steel Frame Available With Deduct (180-210 Frames)
- * Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.33	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.5	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.75	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
1	143	\$488	143	\$423	145	\$575	182	\$1,049	213	\$1,416	215	\$1,841
1.5	143	\$488	145	\$469	182	\$751	184	\$1,164	213	\$1,571	254	\$2,043
2	145	\$580	145	\$514	184	\$836	213	\$1,296	215	\$1,750	256	\$2,274
3	182	\$767	182	\$678	213	\$1,036	215	\$1,606	254	\$2,168	—	—
5	184	\$962	184	\$788	215	\$1,483	254	\$2,299	256	\$3,104	—	—
7.5	213	\$1,192	213	\$1,078	254	\$1,979	256	\$3,067	—	—	—	—
10	215	\$1,397	215	\$1,302	256	\$2,390	284	\$3,680	—	—	—	—
15	254	\$1,999	254	\$1,798	284	\$2,868	—	—	—	—	—	—
20	256	\$2,475	256	\$2,216	—	—	—	—	—	—	—	—
25	284	\$3,036	284	\$2,659	—	—	—	—	—	—	—	—
30	—	—	286	\$3,101	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

* For Larger Ratings Not Shown, Refer To Hostile Duty.

DISCOUNT SYMBOL: DS-3MET

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FUT

UNIMOUNT[®] Energy Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 56-140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts
- * Lifting Provisions On 180 Frame And Up

- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder
- * Rolled Steel Frame Available With Deduct (180-210 Frames)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$439	143	\$381	143	\$518	145	\$944	—	—	—	—
0.33	143	\$439	143	\$381	143	\$518	145	\$944	—	—	—	—
0.5	143	\$439	143	\$381	143	\$518	145	\$944	—	—	—	—
0.75	143	\$439	143	\$381	143	\$518	145	\$944	—	—	—	—
1	143	\$439	143	\$381	145	\$518	182	\$944	—	—	—	—
1.5	143	\$439	145	\$422	182	\$676	184	\$1,048	—	—	—	—
2	145	\$522	145	\$463	184	\$752	213	\$1,166	—	—	—	—
3	182	\$690	182	\$610	213	\$932	215	\$1,445	—	—	—	—
5	184	\$866	184	\$709	215	\$1,335	254	\$2,069	—	—	—	—
7.5	213	\$1,073	213	\$970	254	\$1,781	256	\$2,760	—	—	—	—
10	215	\$1,257	215	\$1,172	256	\$2,151	284	\$3,392	—	—	—	—
15	254	\$1,799	254	\$1,618	284	\$3,081	286	\$4,332	—	—	—	—
20	256	\$2,228	256	\$1,994	286	\$3,642	286	\$4,982	—	—	—	—
25	284	\$2,732	284	\$2,393	—	—	—	—	—	—	—	—
30	—	—	286	\$2,791	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

* For 720 Or 600 RPM, Use Standard Efficiency Or Premium Efficiency.

* For Larger Ratings Not Shown, Refer To Hostile Duty.

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



UT

UNIMOUNT[®] Standard Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 56-140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts

- * Lifting Provisions On 180 Frame And Up
- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.33	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.5	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.75	56	\$390	56	\$338	143	\$460	145	\$839	—	—	—	—
1	143	\$390	143	\$338	145	\$460	182	\$839	213	\$1,133	215	\$1,473
1.5	143	\$390	145	\$375	182	\$601	184	\$931	213	\$1,257	254	\$1,634
2	145	\$464	145	\$411	184	\$669	213	\$1,037	215	\$1,400	256	\$1,820
3	182	\$614	182	\$542	213	\$829	215	\$1,285	254	\$1,734	284	\$2,583
5	184	\$770	184	\$630	215	\$1,186	254	\$1,839	256	\$2,483	286	\$3,265
7.5	213	\$954	213	\$862	254	\$1,583	256	\$2,454	284	\$3,052	—	—
10	215	\$1,118	215	\$1,042	256	\$1,912	284	\$3,015	—	—	—	—
15	254	\$1,599	254	\$1,438	284	\$2,739	286	\$3,851	—	—	—	—
20	256	\$1,980	256	\$1,773	286	\$3,237	286	\$4,428	—	—	—	—
25	284	\$2,429	284	\$2,127	—	—	—	—	—	—	—	—
30	286	\$2,867	286	\$2,481	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Hostile Duty.

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®]† Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



SE

STEEL EDGE[®] Premium Efficient - IE3

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

* Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.33	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.5	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.75	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
1	143	\$488	143	\$423	145	\$575	182	\$1,049	—	—	—	—
1.5	143	\$488	145	\$469	182	\$645	184	\$1,164	—	—	—	—
2	145	\$580	145	\$514	184	\$732	213	\$1,296	—	—	—	—
3	182	\$605	182	\$605	213	\$928	215	\$1,606	—	—	—	—
5	184	\$715	184	\$715	215	\$1,155	254	\$2,299	—	—	—	—
7.5	213	\$942	213	\$905	254	\$1,395	256	\$3,067	—	—	—	—
10	215	\$1,078	215	\$1,115	256	\$1,674	—	—	—	—	—	—
15	254	\$1,543	254	\$1,540	—	—	—	—	—	—	—	—
20	256	\$1,910	256	\$1,898	—	—	—	—	—	—	—	—

† All marks shown within this document are properties of their respective owners.

Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by EISA-2007/IHP HP Motors Final 2016



FS

STEEL EDGE[®] Premium Efficient - IE3

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

* Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.33	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.5	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.75	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
1	143	\$439	143	\$380	145	\$517	182	\$944	—	—	—	—
1.5	143	\$439	145	\$422	182	\$580	184	\$1047	—	—	—	—
2	145	\$522	145	\$462	184	\$658	213	\$1166	—	—	—	—
3	182	\$544	182	\$544	213	\$835	215	\$1445	—	—	—	—
5	184	\$643	184	\$643	215	\$1039	254	\$2069	—	—	—	—
7.5	213	\$847	213	\$814	254	\$1255	256	\$2760	—	—	—	—
10	215	\$970	215	\$1003	256	\$1506	—	—	—	—	—	—
15	254	\$1388	254	\$1386	284	—	—	—	—	—	—	—
20	256	\$1719	256	\$1708	286	—	—	—	—	—	—	—

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by EISA-2007/IHP HP Motors Final 2016



S

STEEL EDGE[®] Premium Efficient - IE3

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

* Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.33	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.5	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.75	56	\$390	56	\$338	143	\$460	145	\$839	—	—	—	—
1	143	\$390	143	\$338	145	\$460	182	\$849	—	—	—	—
1.5	143	\$390	145	\$375	182	\$522	184	\$942	—	—	—	—
2	145	\$464	145	\$411	184	\$592	213	\$1049	—	—	—	—
3	182	\$489	182	\$489	213	\$751	215	\$1300	—	—	—	—
5	184	\$578	184	\$578	215	\$935	254	\$1862	—	—	—	—
7.5	213	\$762	213	\$732	254	\$1129	256	\$2484	—	—	—	—
10	215	\$873	215	\$902	256	\$1355	—	—	—	—	—	—
15	254	\$1249	254	\$1247	—	—	—	—	—	—	—	—
20	256	\$1547	256	\$1537	—	—	—	—	—	—	—	—

† All marks shown within this document are properties of their respective owners.

Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

SE

STEEL EDGE[®] Premium Efficient - IE3

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

* Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.33	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.5	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
0.75	143	\$488	143	\$423	143	\$575	145	\$1,049	—	—	—	—
1	143	\$488	143	\$423	145	\$575	182	\$1,049	—	—	—	—
1.5	143	\$488	145	\$469	182	\$645	184	\$1,164	—	—	—	—
2	145	\$580	145	\$514	184	\$732	213	\$1,296	—	—	—	—
3	182	\$605	182	\$605	213	\$928	215	\$1,606	—	—	—	—
5	184	\$715	184	\$715	215	\$1,155	254	\$2,299	—	—	—	—
7.5	213	\$942	213	\$905	254	\$1,395	256	\$3,067	—	—	—	—
10	215	\$1,078	215	\$1,115	256	\$1,674	—	—	—	—	—	—
15	254	\$1,543	254	\$1,540	—	—	—	—	—	—	—	—
20	256	\$1,910	256	\$1,898	—	—	—	—	—	—	—	—

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016

FS

STEEL EDGE[®] Energy Efficient - IE2

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.33	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.5	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
0.75	143	\$439	143	\$380	143	\$517	145	\$944	—	—	—	—
1	143	\$439	143	\$380	145	\$517	182	\$944	—	—	—	—
1.5	143	\$439	145	\$422	182	\$580	184	\$1047	—	—	—	—
2	145	\$522	145	\$462	184	\$658	213	\$1166	—	—	—	—
3	182	\$544	182	\$544	213	\$835	215	\$1445	—	—	—	—
5	184	\$643	184	\$643	215	\$1039	254	\$2069	—	—	—	—
7.5	213	\$847	213	\$814	254	\$1255	256	\$2760	—	—	—	—
10	215	\$970	215	\$1003	256	\$1506	—	—	—	—	—	—
15	254	\$1388	254	\$1386	284	—	—	—	—	—	—	—
20	256	\$1719	256	\$1708	286	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Unimount or Hostile Duty.

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by EISA-2007/IHP HP Motors Final 2016

S

STEEL EDGE[®] Standard Efficient - IE1

* Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power

* 1.15 Service Factor

* Rolled Steel Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Non-Vent (TENV) Available With Adder

* Air-Over (TEAO) Available With Deduct

* Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.33	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.5	56	\$390	56	\$338	56	\$460	145	\$839	—	—	—	—
0.75	56	\$390	56	\$338	143	\$460	145	\$839	—	—	—	—
1	143	\$390	143	\$338	145	\$460	182	\$849	—	—	—	—
1.5	143	\$390	145	\$375	182	\$522	184	\$942	—	—	—	—
2	145	\$464	145	\$411	184	\$592	213	\$1049	—	—	—	—
3	182	\$489	182	\$489	213	\$751	215	\$1300	—	—	—	—
5	184	\$578	184	\$578	215	\$935	254	\$1862	—	—	—	—
7.5	213	\$762	213	\$732	254	\$1129	256	\$2484	—	—	—	—
10	215	\$873	215	\$902	256	\$1355	—	—	—	—	—	—
15	254	\$1249	254	\$1247	—	—	—	—	—	—	—	—
20	256	\$1547	256	\$1537	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Unimount or Hostile Duty.

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



CTE

World Motor - Hostile Duty Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power
- * IP54 Ingress Protection
- * 1.15 Service Factor
- * Cast Iron Frame and End Shields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2
- * Class 1, Group A/B/C/D, T3 T-Code
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder
- * Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$513	143	\$461	143	\$588	145	\$840	—	—	—	—
0.33	143	\$513	143	\$461	143	\$588	145	\$840	—	—	—	—
0.5	143	\$513	143	\$461	143	\$588	145	\$840	—	—	—	—
0.75	143	\$513	143	\$461	143	\$588	145	\$840	—	—	—	—
1	143	\$513	143	\$461	145	\$588	182	\$840	213	\$1,013	215	\$1,316
1.5	143	\$513	145	\$492	182	\$662	184	\$1,025	213	\$1,236	254	\$1,624
2	145	\$533	145	\$541	184	\$755	213	\$1,045	215	\$1,426	256	\$1,818
3	182	\$619	182	\$590	213	\$940	215	\$1,457	254	\$1,949	284	\$2,435
5	184	\$734	184	\$673	215	\$1,213	254	\$1,899	256	\$2,417	286	\$3,497
7.5	213	\$955	213	\$917	254	\$1,629	256	\$2,476	284	\$3,268	324	\$4,176
10	215	\$1,114	215	\$1,142	256	\$1,936	284	\$2,883	324	\$4,087	326	\$5,148
15	254	\$1,568	254	\$1,528	284	\$2,558	286	\$3,773	326	\$4,530	364	\$5,889
20	256	\$1,944	256	\$1,901	286	\$3,144	324	\$4,559	364	\$5,473	365	\$7,115
25	284	\$2,311	284	\$2,236	324	\$4,017	326	\$5,269	365	\$7,114	405	\$9,248
30	286	\$2,772	286	\$2,655	326	\$4,569	364	\$5,891	405	\$7,953	405	\$10,339
40	324	\$3,268	324	\$3,169	364	\$5,062	365	\$7,340	405	\$9,909	445	\$12,882
50	326	\$4,379	326	\$3,934	365	\$6,295	404	\$9,128	445	\$12,322	445	\$16,019
60	364	\$5,631	364	\$5,504	404	\$7,406	405	\$9,998	445	\$13,497	447	\$17,547
75	365	\$7,251	365	\$6,720	405	\$8,811	444	\$11,895	447	\$16,058	449	\$23,162
100	405	\$9,720	405	\$8,811	444	\$11,829	445	\$15,969	449	\$21,197	—	—
125	444	\$12,171	444	\$11,431	445	\$14,691	447	\$19,833	—	—	—	—
150	445	\$15,429	445	\$13,766	447	\$16,800	449	\$26,180	—	—	—	—
200	447	\$21,086	447	\$17,829	449	\$22,199	—	—	—	—	—	—
250	449	\$25,810	449	\$22,927	—	—	—	—	—	—	—	—
300	449	\$30,857	449	\$26,488	—	—	—	—	—	—	—	—
350	—	—	449	\$28,878	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-HDMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FCT

World Motor - Hostile Duty Energy Efficient - IE2

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * IP54 Ingress Protection
- * 1.15 Service Factor
- * Cast Iron Frame and End Shields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2
- * Class 1, Group A/B/C/D, T3 T-Code
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$462	143	\$415	143	\$529	145	\$756	—	—	—	—
0.33	143	\$462	143	\$415	143	\$529	145	\$756	—	—	—	—
0.5	143	\$462	143	\$415	143	\$529	145	\$756	—	—	—	—
0.75	143	\$462	143	\$415	143	\$529	145	\$756	—	—	—	—
1	143	\$462	143	\$415	145	\$529	182	\$756	—	—	—	—
1.5	143	\$462	145	\$443	182	\$596	184	\$923	—	—	—	—
2	145	\$480	145	\$487	184	\$680	213	\$941	—	—	—	—
3	182	\$557	182	\$531	213	\$846	215	\$1,311	—	—	—	—
5	184	\$661	184	\$606	215	\$1,092	254	\$1,709	—	—	—	—
7.5	213	\$860	213	\$825	254	\$1,466	256	\$2,228	—	—	—	—
10	215	\$1,003	215	\$1,028	256	\$1,742	284	\$2,595	—	—	—	—
15	254	\$1,411	254	\$1,375	284	\$2,302	286	\$3,396	—	—	—	—
20	256	\$1,750	256	\$1,711	286	\$2,830	324	\$4,331	—	—	—	—
25	284	\$2,080	284	\$2,012	324	\$3,816	326	\$5,005	—	—	—	—
30	286	\$2,495	286	\$2,390	326	\$4,341	364	\$5,597	—	—	—	—
40	324	\$3,104	324	\$3,010	364	\$4,809	365	\$6,972	—	—	—	—
50	326	\$4,160	326	\$3,736	365	\$5,980	404	\$8,671	—	—	—	—
60	364	\$5,349	364	\$5,229	404	\$7,035	405	\$9,497	—	—	—	—
75	365	\$6,888	365	\$6,383	405	\$8,370	444	\$11,300	—	—	—	—
100	405	\$9,233	405	\$8,370	444	\$11,237	445	\$15,171	—	—	—	—
125	444	\$11,562	444	\$10,859	445	\$13,956	447	\$18,841	—	—	—	—
150	445	\$14,657	445	\$13,077	447	\$15,960	449	\$24,870	—	—	—	—
200	447	\$20,031	447	\$16,937	449	\$21,089	—	—	—	—	—	—
250	449	\$24,520	449	\$21,780	—	—	—	—	—	—	—	—
300	449	\$29,314	449	\$25,163	—	—	—	—	—	—	—	—
350	—	—	449	\$27,434	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B - Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-HDMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



CT

World Motor - Hostile Duty Standard Efficient - IE1

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * IP54 Ingress Protection
- * 1.15 Service Factor
- * Cast Iron Frame and End Shields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2
- * Class 1, Group A/B/C/D, T3 T-Code
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$410	143	\$369	143	\$470	145	\$672	—	—	—	—
0.33	143	\$410	143	\$369	143	\$470	145	\$672	—	—	—	—
0.5	143	\$410	143	\$369	143	\$470	145	\$672	—	—	—	—
0.75	143	\$410	143	\$369	143	\$470	145	\$672	—	—	—	—
1	143	\$410	143	\$369	145	\$470	182	\$672	213	\$810	215	\$1,053
1.5	143	\$410	145	\$394	182	\$530	184	\$820	213	\$989	254	\$1,299
2	145	\$426	145	\$433	184	\$604	213	\$836	215	\$1,141	256	\$1,454
3	182	\$495	182	\$472	213	\$752	215	\$1,166	254	\$1,559	284	\$1,948
5	184	\$587	184	\$538	215	\$970	254	\$1,519	256	\$1,934	286	\$2,798
7.5	213	\$764	213	\$734	254	\$1,303	256	\$1,981	284	\$2,614	324	\$3,758
10	215	\$891	215	\$914	256	\$1,549	284	\$2,306	324	\$3,678	326	\$4,633
15	254	\$1,254	254	\$1,222	284	\$2,046	286	\$3,018	326	\$4,077	364	\$5,300
20	256	\$1,555	256	\$1,521	286	\$2,515	324	\$4,103	364	\$4,925	365	\$6,404
25	284	\$1,849	284	\$1,789	324	\$3,615	326	\$4,742	365	\$6,401	405	\$8,322
30	286	\$2,218	286	\$2,124	326	\$4,112	364	\$5,302	405	\$7,157	405	\$9,305
40	324	\$2,941	324	\$2,852	364	\$4,555	365	\$6,606	405	\$8,917	445	\$11,593
50	326	\$3,941	326	\$3,540	365	\$5,665	404	\$8,214	445	\$11,090	445	\$14,417
60	364	\$5,067	364	\$4,954	404	\$6,665	405	\$8,998	445	\$12,147	447	\$15,792
75	365	\$6,526	365	\$6,048	405	\$7,929	444	\$10,705	447	\$14,452	449	\$20,845
100	405	\$8,747	405	\$7,929	444	\$10,645	445	\$14,372	449	\$19,077	—	—
125	444	\$10,954	444	\$10,288	445	\$13,222	447	\$17,849	—	—	—	—
150	445	\$13,886	445	\$12,389	447	\$15,120	449	\$23,561	—	—	—	—
200	447	\$18,977	447	\$16,046	449	\$19,979	—	—	—	—	—	—
250	449	\$23,229	449	\$20,634	—	—	—	—	—	—	—	—
300	449	\$27,771	449	\$23,839	—	—	—	—	—	—	—	—
350	—	—	449	\$25,990	—	—	—	—	—	—	—	—

DISCOUNT SYMBOL: DS-HDMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



TCE

World Motor - CORRO-DUTY® Premium Efficient - IE3

* Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power

* IP55 Ingress Protection

* 1.15 Service Factor, Special Balance (0.08 IPS)

* All Cast Iron Construction

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* Shaft Slinger and Umbrella Seal On Pulley End

* Insulife-2000 Insulation Treatment, Stainless Breather Drains

* Lead Positioning Gasket And Ground Lug In Conduit Box

* Lifting Provisions And Regreasable Bearings

* Self-Certified Division 2

* Class 1, Group A/B/C/D, T3 T-Code

* Cast Iron Bearing Caps

* Air-Over (TEAO) Available With Deduct

* Non-Vent (TENV) With Adder

* Multi-Speed Available With Adder

* Inverter Suitable (Reference Page iv)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$616	143	\$553	143	\$705	145	\$1,008	—	—	—	—
0.33	143	\$616	143	\$553	143	\$705	145	\$1,008	—	—	—	—
0.5	143	\$616	143	\$553	143	\$705	145	\$1,008	—	—	—	—
0.75	143	\$616	143	\$553	143	\$705	145	\$1,008	—	—	—	—
1	143	\$616	143	\$553	145	\$705	182	\$1,008	213	\$1,475	215	\$1,578
1.5	143	\$581	145	\$591	182	\$813	184	\$1,230	213	\$1,483	254	\$1,949
2	145	\$640	145	\$649	184	\$955	213	\$1,255	215	\$1,693	256	\$2,182
3	182	\$742	182	\$709	213	\$1,264	215	\$1,749	254	\$2,385	284	\$2,922
5	184	\$881	184	\$808	215	\$1,629	254	\$2,280	256	\$3,018	286	\$3,836
7.5	213	\$1,098	213	\$1,055	254	\$1,854	256	\$2,846	284	\$3,693	324	\$4,801
10	215	\$1,281	215	\$1,314	256	\$2,246	284	\$3,315	324	\$4,552	326	\$5,918
15	254	\$1,804	254	\$1,757	284	\$2,984	286	\$4,149	326	\$5,505	364	\$7,158
20	256	\$2,236	256	\$2,186	286	\$3,537	324	\$5,129	364	\$6,771	365	\$8,802
25	284	\$2,542	284	\$2,459	324	\$4,418	326	\$5,795	365	\$8,648	405	\$10,171
30	286	\$3,050	286	\$2,920	326	\$5,025	364	\$6,480	405	\$9,837	405	\$11,372
40	324	\$3,595	324	\$3,486	364	\$5,568	365	\$8,073	405	\$10,899	445	\$14,169
50	326	\$4,817	326	\$4,327	365	\$6,925	404	\$10,041	445	\$13,555	445	\$17,622
60	364	\$6,194	364	\$6,044	404	\$8,147	405	\$10,998	445	\$14,847	447	\$19,302
75	365	\$7,976	365	\$7,392	405	\$9,692	444	\$13,084	447	\$17,663	449	\$25,479
100	405	\$10,692	405	\$9,692	444	\$12,657	445	\$17,086	449	\$23,315	—	—
125	444	\$13,023	444	\$12,231	445	\$15,719	447	\$21,220	—	—	—	—
150	445	\$16,509	445	\$14,730	447	\$17,976	449	\$28,010	—	—	—	—
200	447	\$22,562	447	\$19,077	449	\$23,753	—	—	—	—	—	—
250	449	\$27,617	449	\$24,532	—	—	—	—	—	—	—	—
300	449	\$33,017	449	\$28,342	—	—	—	—	—	—	—	—
350	—	—	449	\$30,899	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B - Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-CEMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FTC

World Motor - CORRO-DUTY[®] Energy Efficient - IE2

* Class F Insulation, Class B Rise At Full Load On

60 Hertz Sine Wave Power

* IP55 Ingress Protection

* 1.15 Service Factor, Special Balance (0.08 IPS)

* All Cast Iron Construction

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* Shaft Slinger and Umbrella Seal On Pulley End

* Insulife-2000 Insulation Treatment, Stainless Breather Drains

* Lead Positioning Gasket And Ground Lug In Conduit Box

* Lifting Provisions And Regreasable Bearings

* Self-Certified Division 2

* Class 1, Group A/B/C/D, T3 T-Code

* Cast Iron Bearing Caps

* Air-Over (TEAO) Available With Deduct

* Non-Vent (TENV) With Adder

* Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$554	143	\$498	143	\$635	145	\$907	—	—	—	—
0.33	143	\$554	143	\$498	143	\$635	145	\$907	—	—	—	—
0.5	143	\$554	143	\$498	143	\$635	145	\$907	—	—	—	—
0.75	143	\$554	143	\$498	143	\$635	145	\$907	—	—	—	—
1	143	\$554	143	\$498	145	\$635	182	\$907	—	—	—	—
1.5	143	\$523	145	\$532	182	\$732	184	\$1,107	—	—	—	—
2	145	\$576	145	\$584	184	\$860	213	\$1,130	—	—	—	—
3	182	\$668	182	\$638	213	\$1,138	215	\$1,574	—	—	—	—
5	184	\$793	184	\$727	215	\$1,466	254	\$2,052	—	—	—	—
7.5	213	\$988	213	\$950	254	\$1,669	256	\$2,561	—	—	—	—
10	215	\$1,153	215	\$1,183	256	\$2,021	284	\$2,984	—	—	—	—
15	254	\$1,624	254	\$1,581	284	\$2,686	286	\$3,734	—	—	—	—
20	256	\$2,012	256	\$1,967	286	\$3,183	324	\$4,873	—	—	—	—
25	284	\$2,288	284	\$2,213	324	\$4,197	326	\$5,505	—	—	—	—
30	286	\$2,745	286	\$2,628	326	\$4,774	364	\$6,157	—	—	—	—
40	324	\$3,415	324	\$3,311	364	\$5,290	365	\$7,668	—	—	—	—
50	326	\$4,576	326	\$4,109	365	\$6,578	404	\$9,538	—	—	—	—
60	364	\$5,884	364	\$5,742	404	\$7,739	405	\$10,447	—	—	—	—
75	365	\$7,577	365	\$7,021	405	\$9,207	444	\$12,430	—	—	—	—
100	405	\$10,156	405	\$9,207	444	\$12,024	445	\$16,232	—	—	—	—
125	444	\$12,371	444	\$11,619	445	\$14,933	447	\$20,159	—	—	—	—
150	445	\$15,683	445	\$13,993	447	\$17,077	449	\$26,610	—	—	—	—
200	447	\$21,433	447	\$18,123	449	\$22,565	—	—	—	—	—	—
250	449	\$26,237	449	\$23,305	—	—	—	—	—	—	—	—
300	449	\$31,366	449	\$26,924	—	—	—	—	—	—	—	—
350	—	—	449	\$29,354	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B - Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-CEMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



TC

World Motor - CORRO-DUTY[®] Standard Efficient - IE1

* Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power

* IP55 Ingress Protection

* 1.15 Service Factor, Special Balance (0.08 IPS)

* All Cast Iron Construction

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* Shaft Slinger and Umbrella Seal On Pulley End

* Insulife-2000 Insulation Treatment, Stainless Breather Drains

* Lead Positioning Gasket And Ground Lug In Conduit Box

* Lifting Provisions And Regreasable Bearings

* Self-Certified Division 2

* Class 1, Group A/B/C/D, T3 T-Code

* Cast Iron Bearing Caps

* Air-Over (TEAO) Available With Deduct

* Non-Vent (TENV) With Adder

* Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$493	143	\$442	143	\$564	145	\$806	—	—	—	—
0.33	143	\$493	143	\$442	143	\$564	145	\$806	—	—	—	—
0.5	143	\$493	143	\$442	143	\$564	145	\$806	—	—	—	—
0.75	143	\$493	143	\$442	143	\$564	145	\$806	—	—	—	—
1	143	\$493	143	\$442	145	\$564	182	\$806	213	\$1,180	215	\$1,262
1.5	143	\$465	145	\$473	182	\$650	184	\$984	213	\$1,186	254	\$1,559
2	145	\$512	145	\$519	184	\$764	213	\$1,004	215	\$1,354	256	\$1,746
3	182	\$594	182	\$567	213	\$1,011	215	\$1,399	254	\$1,908	284	\$2,338
5	184	\$705	184	\$646	215	\$1,303	254	\$1,824	256	\$2,414	286	\$3,069
7.5	213	\$878	213	\$844	254	\$1,483	256	\$2,277	284	\$2,954	324	\$4,321
10	215	\$1,025	215	\$1,051	256	\$1,797	284	\$2,652	324	\$4,097	326	\$5,326
15	254	\$1,443	254	\$1,406	284	\$2,387	286	\$3,319	326	\$4,955	364	\$6,442
20	256	\$1,789	256	\$1,749	286	\$2,830	324	\$4,616	364	\$6,093	365	\$7,922
25	284	\$2,034	284	\$1,967	324	\$3,976	326	\$5,215	365	\$7,781	405	\$9,153
30	286	\$2,440	286	\$2,336	326	\$4,523	364	\$5,832	405	\$8,852	405	\$10,235
40	324	\$3,235	324	\$3,137	364	\$5,010	365	\$7,266	405	\$9,808	445	\$12,751
50	326	\$4,335	326	\$3,894	365	\$6,232	404	\$9,036	445	\$12,200	445	\$15,860
60	364	\$5,574	364	\$5,440	404	\$7,332	405	\$9,898	445	\$13,362	447	\$17,371
75	365	\$7,179	365	\$6,653	405	\$8,722	444	\$11,775	447	\$15,896	449	\$22,930
100	405	\$9,622	405	\$8,722	444	\$11,390	445	\$15,377	449	\$20,983	—	—
125	444	\$11,721	444	\$11,008	445	\$14,147	447	\$19,097	—	—	—	—
150	445	\$14,858	445	\$13,257	447	\$16,178	449	\$25,208	—	—	—	—
200	447	\$20,305	447	\$17,169	449	\$21,378	—	—	—	—	—	—
250	449	\$24,855	449	\$22,078	—	—	—	—	—	—	—	—
300	449	\$29,715	449	\$25,508	—	—	—	—	—	—	—	—
350	—	—	449	\$27,809	—	—	—	—	—	—	—	—

DISCOUNT SYMBOL: DS-CEMW

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Three Phase Modifiable NEMA®† Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



CE

World Motor - 841 PLUS® Premium Efficient - IE3 Meets IEEE Std 841™-2021

* Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power

* Inverter Grade® Insulation System (Meets NEMA®† MG-1 Part 31)

* IP55 Ingress Protection

* 1.15 Service Factor, Precision Balance (.05 ips)

* All Cast Iron Construction

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* VBXX®† Bearing Isolators By Inpro/Seal®† On Both Ends

* Insulife-2000 Insulation Treatment

* Stainless Breather Drains And Lead Positioning Gasket

* Ground Lug In Conduit Box And Ground Bolt On Frame

* Lifting Provisions And Regreasable Bearings

* Self-Certified Division 2

* Class 1, Group A/B/C/D, T3 T-Code

* Cast Iron Bearing Caps

* Inverter Duty Winding

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
1	143	\$739	143	\$663	145	\$846	182	\$1,159	213	\$1,696	215	\$1,815
1.5	143	\$697	145	\$709	182	\$935	184	\$1,415	213	\$1,706	254	\$2,144
2	145	\$768	145	\$779	184	\$1,098	213	\$1,443	215	\$2,320	256	\$2,400
3	182	\$854	182	\$815	213	\$1,453	215	\$2,011	254	\$2,624	284	\$3,215
5	184	\$1,013	184	\$929	215	\$1,874	254	\$2,508	256	\$3,319	286	\$4,219
7.5	213	\$1,263	213	\$1,213	254	\$2,039	256	\$3,131	284	\$4,062	324	\$5,430
10	215	\$1,473	215	\$1,511	256	\$2,470	284	\$3,646	324	\$5,062	326	\$6,580
15	254	\$1,984	254	\$1,932	284	\$3,283	286	\$4,564	326	\$5,978	364	\$7,772
20	256	\$2,459	256	\$2,405	286	\$3,891	324	\$5,352	364	\$7,225	365	\$9,393
25	284	\$2,796	284	\$2,705	324	\$4,597	326	\$6,666	365	\$8,999	405	\$11,698
30	286	\$3,355	286	\$3,212	326	\$5,139	364	\$7,452	405	\$10,060	405	\$13,077
40	324	\$4,815	324	\$4,009	364	\$6,403	365	\$9,284	405	\$12,534	445	\$16,294
50	326	\$5,540	326	\$4,976	365	\$7,964	404	\$11,548	445	\$15,590	445	\$20,266
60	364	\$7,123	364	\$6,876	404	\$9,369	405	\$12,648	445	\$17,075	447	\$22,198
75	365	\$9,172	365	\$8,501	405	\$11,146	444	\$15,047	447	\$20,314	—	—
100	405	\$12,296	405	\$11,146	444	\$13,923	445	\$18,796	—	—	—	—
125	444	\$14,325	444	\$13,454	445	\$17,291	447	\$23,343	—	—	—	—
150	445	\$18,160	445	\$16,203	447	\$19,774	—	—	—	—	—	—
200	447	\$24,818	447	\$20,985	449	\$26,128	—	—	—	—	—	—
250	449	\$30,379	449	\$26,985	—	—	—	—	—	—	—	—
300	—	—	449	\$31,176	—	—	—	—	—	—	—	—

* 50 Hertz 841 PLUS® Motors Require Special Tagging. Make Adder For Special I.D. Nameplate.

* 720 & 600 RPM 841 PLUS® Motors will be marked "IEEE STD 841™-2021 FEATURES".

* Designed To Meet The GM7E-TA Specification.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-841MW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



CE6

World Motor - 661 PLUS[®] Premium Efficient - IE3 Meets IEEE Std 841[™]-2021

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * IP56 Ingress Protection
- * 1.15 Service Factor, Precision Balance (.05 ips)
- * All Cast Iron Construction
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * VBXX^{®†} Bearing Isolators By Inpro/Seal^{®†} On Both Ends
- * Insulife 2000 Insulation Treatment
- * Stainless Breather Drains And Lead Positioning Gasket
- * Ground Lug In Conduit Box And Ground Bolt On Frame
- * Lifting Provisions And Regreasable Bearings
- * RTV Sealant On Bolt Holes And Register Fits
- * Drive End Roller Bearing On 210 Frame And Up
- * Self-Certified Division 2
- * Class 1, Group A/B/C/D, T3 T-Code
- * Cast Iron Bearing Caps
- * Inverter Duty Winding

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
5	—	—	184	\$1,152	215	\$2,230	254	\$2,815	—	—	—	—
7.5	—	—	213	\$1,551	254	\$2,348	256	\$3,443	—	—	—	—
10	—	—	215	\$1,862	256	\$2,785	284	\$3,976	—	—	—	—
15	—	—	254	\$2,267	284	\$3,622	286	\$4,882	—	—	—	—
20	—	—	256	\$2,734	286	\$4,211	324	\$5,705	—	—	—	—
25	—	—	284	\$3,072	324	\$4,999	326	\$7,071	—	—	—	—
30	—	—	286	\$3,595	326	\$5,530	364	\$7,884	—	—	—	—
40	—	—	324	\$4,426	364	\$6,782	365	\$9,708	—	—	—	—
50	—	—	326	\$5,398	365	\$8,373	404	\$12,037	—	—	—	—
60	—	—	364	\$7,315	404	\$9,867	405	\$13,124	—	—	—	—
75	—	—	365	\$8,936	405	\$11,659	444	\$16,010	—	—	—	—
100	—	—	405	\$11,690	444	\$14,792	445	\$19,647	—	—	—	—
125	—	—	444	\$14,445	445	\$18,230	447	\$24,480	—	—	—	—
150	—	—	445	\$17,198	447	\$20,860	—	—	—	—	—	—
200	—	—	447	\$22,210	—	—	—	—	—	—	—	—

* 50 Hertz 841 PLUS[®] Motors Require Special Tagging. Make Adder For Special I.D. Nameplate.

* Designed To Meet The GM7E-TA Specification.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-841MW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable IEC Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

ICTE

World Motor - Hostile Duty - IE3

* Class F Insulation, Class B Rise At Full Load On
50 or 60 Hertz Sine Wave Power
* IP55 Ingress Protection
* 1.0 Service Factor
* Cast Iron Frame and End Shields
* Corrosion Resistant Mill And
Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated
Hardware
* Shaft Slinger and Umbrella Seal
On Pulley End
* Cast Iron Conduit Box with Terminal Block
* Lifting Provisions
* Regreasable Bearings On 250 Frame And Up
* Self-Certified Division 2, Class 1,

Group A/B/C/D, T3 T-Code
* Self-Certified Zone 2, Groups IIA, IIB,
IIC, T3 T-Code
* Non-Vent (TENV) Available With Adder
* Air-Over (TEAO) Available With Deduct
* Multi-Speed Available With Adder
* Inverter Suitable (Reference Page v)

KW	HP	RPM @ 60 Hertz											
		3600		1800		1200		900		720		600	
		Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.18	0.25	90	\$539	90	\$484	90	\$618	90	\$882	—	—	—	—
0.25	0.33	90	\$539	90	\$484	90	\$618	90	\$882	—	—	—	—
0.37	0.5	90	\$539	90	\$484	90	\$618	90	\$882	—	—	—	—
0.55	0.75	90	\$539	90	\$484	90	\$618	90	\$882	—	—	—	—
0.75	1	90	\$539	90	\$484	90	\$618	112	\$882	132	\$1,064	132	\$1,382
1.1	1.5	90	\$539	90	\$517	112	\$695	112	\$1,076	132	\$1,298	160	\$1,705
1.5	2	90	\$560	90	\$568	112	\$793	132	\$1,098	132	\$1,497	160	\$1,909
2.2	3	90	\$690	112	\$620	112	\$987	132	\$1,530	160	\$2,047	180	\$2,557
3.0	4	112	\$711	112	\$664	132	\$1,130	160	\$1,762	160	\$2,293	180	\$2,957
3.7	5	112	\$771	112	\$707	132	\$1,273	160	\$1,994	160	\$2,538	180	\$3,356
5.5	7.5	132	\$1,003	132	\$963	132	\$1,710	160	\$2,600	180	\$3,432	200	\$4,385
7.5	10	132	\$1,170	132	\$1,199	160	\$2,032	180	\$3,028	200	\$4,292	200	\$5,406
11.0	15	160	\$1,646	160	\$1,604	160	\$2,686	180	\$3,962	200	\$4,756	225	\$6,183
15.0	20	160	\$2,041	160	\$1,996	180	\$3,301	200	\$4,787	225	\$5,746	225	\$7,471
18.5	25	160	\$2,127	180	\$2,348	200	\$4,217	200	\$5,532	225	\$7,469	250	\$9,710
22.0	30	180	\$2,911	180	\$2,788	200	\$4,797	225	\$6,186	250	\$8,351	250	\$10,856
30.0	40	200	\$3,431	200	\$3,327	225	\$5,315	225	\$7,707	250	\$10,404	280	\$13,525
37.5	50	200	\$4,598	225	\$4,131	250	\$6,610	250	\$9,584	280	\$12,939	280	\$16,820
45.0	60	225	\$5,913	225	\$5,779	280	\$7,776	250	\$10,498	280	\$14,172	280	\$18,424
55.0	75	250	\$7,614	250	\$7,056	280	\$9,252	280	\$12,490	280	\$16,860	—	—
75.0	100	280	\$10,206	280	\$9,252	280	\$12,420	280	\$16,768	—	—	—	—
90.0	125	280	\$12,780	280	\$12,003	280	\$15,425	280	\$20,825	—	—	—	—
110.0	150	280	\$16,200	280	\$14,454	280	\$17,640	—	—	—	—	—	—
150.0	200	280	\$22,140	280	\$18,720	—	—	—	—	—	—	—	—
185.0	250	280	\$27,100	280	\$24,075	—	—	—	—	—	—	—	—
225.0	300	280	—	280	\$27,815	—	—	—	—	—	—	—	—

KW	HP	RPM @ 50 Hertz											
		3000		1500		1000		750		600		500	
		Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
1	0.75	90	\$620	90	\$557	90	\$711	112	\$1,014	132	\$1,224	132	\$1,589
1.5	1.1	90	\$620	90	\$595	112	\$799	112	\$1,237	132	\$1,493	160	\$1,961
2	1.5	90	\$644	90	\$653	112	\$912	132	\$1,263	132	\$1,722	160	\$2,195
3	2.2	90	\$794	112	\$713	132	\$1,135	132	\$1,760	160	\$2,354	180	\$2,941
4	3	112	\$818	112	\$764	132	\$1,300	160	\$2,026	160	\$2,637	180	\$3,401
5	4	112	\$887	112	\$813	132	\$1,464	160	\$2,293	160	\$2,919	180	\$3,859
7.5	5.5	132	\$1,153	132	\$1,107	160	\$1,967	160	\$2,990	180	\$3,947	200	\$5,043
10	7.5	132	\$1,346	132	\$1,379	160	\$2,337	180	\$3,482	200	\$4,936	200	\$6,217
15	11	160	\$1,893	160	\$1,845	180	\$3,089	180	\$4,556	200	\$5,469	225	\$7,110
20	15	160	\$2,347	160	\$2,295	180	\$3,796	200	\$5,505	225	\$6,608	225	\$8,592
25	18.5	160	\$2,446	180	\$2,700	200	\$4,850	200	\$6,362	225	\$8,589	250	\$11,167
30	22	180	\$3,348	180	\$3,206	200	\$5,517	225	\$7,114	250	\$9,604	250	\$12,484
40	30	200	\$3,946	200	\$3,826	225	\$6,112	225	\$8,863	250	\$11,965	280	\$14,878
50	37	200	\$5,288	225	\$4,751	225	\$7,602	250	\$11,022	280	\$14,233	280	\$18,502
60	45	225	\$6,800	225	\$6,646	250	\$8,942	250	\$12,073	280	\$15,589	280	\$20,266
75	55	250	\$8,756	250	\$8,114	250	\$10,640	280	\$13,739	280	\$18,546	—	—
100	75	280	\$11,737	280	\$10,640	280	\$13,662	280	\$18,445	—	—	—	—
125	90	280	\$14,058	280	\$13,203	280	\$16,968	280	\$22,908	—	—	—	—
150	110	280	\$17,820	280	\$15,899	280	\$19,404	—	—	—	—	—	—
200	132	280	\$24,354	280	\$20,592	—	—	—	—	—	—	—	—
250	185	280	\$29,810	280	\$26,483	—	—	—	—	—	—	—	—
300	225	—	—	280	\$30,597	—	—	—	—	—	—	—	—

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



LE Single Label

Hazardous Location, Division 1, Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class I, Group D (140-440 Frame)
- * Class I, Group C&D (250-400 Frame)
- * CORRO-DUTY[®] Available With Adder
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$781	143	\$678	143	\$922	145	\$1,419	—	—	—	—
0.33	143	\$781	143	\$678	143	\$922	145	\$1,419	—	—	—	—
0.5	143	\$781	143	\$678	143	\$922	145	\$1,419	—	—	—	—
0.75	143	\$781	143	\$678	143	\$922	145	\$1,419	—	—	—	—
1	143	\$781	143	\$678	145	\$922	182	\$1,419	213	\$1,916	215	\$2,491
1.5	143	\$781	145	\$751	182	\$1,016	184	\$1,575	213	\$2,127	254	\$2,765
2	145	\$928	145	\$824	184	\$1,131	213	\$1,748	215	\$2,360	256	\$3,068
3	182	\$1,038	182	\$917	213	\$1,398	215	\$2,167	254	\$2,925	284	\$3,803
5	184	\$1,302	184	\$1,067	215	\$2,001	254	\$3,012	256	\$4,067	286	\$5,287
7.5	213	\$1,609	213	\$1,455	254	\$2,593	256	\$4,140	284	\$5,590	324	\$7,266
10	215	\$1,885	215	\$1,757	256	\$3,132	284	\$4,938	324	\$6,667	326	\$8,667
15	254	\$2,620	254	\$2,356	284	\$4,294	286	\$6,419	326	\$8,666	364	\$11,266
20	256	\$3,243	256	\$2,903	286	\$5,201	324	\$7,597	364	\$10,256	365	\$13,333
25	284	\$3,913	284	\$3,427	324	\$6,238	326	\$9,000	365	\$12,150	405	\$15,795
30	286	\$4,589	286	\$3,997	326	\$7,360	364	\$10,361	405	\$13,987	405	\$18,184
40	324	\$5,976	324	\$5,260	364	\$9,743	365	\$12,958	405	\$17,493	445	\$22,741
50	326	\$7,690	326	\$6,458	365	\$11,224	404	\$16,506	445	\$22,283	445	\$28,968
60	364	\$10,089	364	\$9,229	404	\$12,945	405	\$18,755	445	\$25,319	447	\$32,914
75	365	\$12,677	365	\$11,738	405	\$15,629	444	\$20,786	447	\$28,062	449	\$36,480
100	405	\$15,689	405	\$13,486	444	\$19,727	445	\$27,081	449	\$36,559	449	\$47,527
125	444	\$19,523	444	\$16,656	445	\$22,565	447	\$29,565	449	\$39,913	—	—
150	445	\$24,026	445	\$19,769	447	\$25,918	449	\$36,048	—	—	—	—
200	447	\$30,363	447	\$24,086	—	—	449	\$38,375	—	—	—	—
250	—	—	449	\$30,108	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* For Temperature Code T3 Or Lower, Use Dual Label.

* Maximum Rating For Each RPM Available As 1.0 S.F. Only.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



LE Dual Label

Hazardous Location, Division 1, Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.00 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class I Group D, Class II Group F&G (140-440 Frame)
- * Class I Group C&D, Class II Group F&G (250-400 Frame)
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed And CORRO-DUTY[®] Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$840	143	\$729	143	\$991	145	\$1,526	—	—	—	—
0.33	143	\$840	143	\$729	143	\$991	145	\$1,526	—	—	—	—
0.5	143	\$840	143	\$729	143	\$991	145	\$1,526	—	—	—	—
0.75	143	\$840	143	\$729	143	\$991	145	\$1,526	—	—	—	—
1	143	\$840	143	\$729	145	\$991	182	\$1,526	213	\$2,060	215	\$2,669
1.5	143	\$840	145	\$808	182	\$1,093	184	\$1,694	213	\$2,287	254	\$2,962
2	145	\$998	145	\$886	184	\$1,216	213	\$1,880	215	\$2,537	256	\$6,748
3	182	\$1,116	182	\$986	213	\$1,503	215	\$2,330	254	\$3,144	284	\$7,499
5	184	\$1,400	184	\$1,147	215	\$2,152	254	\$3,239	256	\$4,373	286	\$7,768
7.5	213	\$1,730	213	\$1,564	254	\$2,788	256	\$4,447	284	\$7,517	324	\$10,231
10	215	\$2,027	215	\$1,889	256	\$3,368	284	\$5,310	324	\$9,744	326	\$10,292
15	254	\$2,817	254	\$2,533	284	\$4,617	286	\$7,160	326	\$8,950	364	\$11,458
20	256	\$3,487	256	\$3,122	286	\$5,593	324	\$8,474	364	\$10,592	365	\$14,797
25	284	\$4,208	284	\$3,685	324	\$6,707	326	\$9,692	365	\$13,933	405	\$19,918
30	286	\$4,934	286	\$4,298	326	\$7,914	364	\$11,158	405	\$19,582	405	\$22,382
40	324	\$6,426	324	\$5,656	364	\$10,476	365	\$13,822	405	\$19,901	445	\$25,985
50	326	\$8,269	326	\$6,944	365	\$12,069	404	\$17,776	445	\$24,996	445	\$31,840
60	364	\$10,848	364	\$9,924	404	\$13,919	405	\$19,634	445	\$28,581	447	\$36,737
75	365	\$13,631	365	\$12,622	405	\$16,190	444	\$21,533	447	\$34,988	449	\$45,922
100	405	\$16,886	405	\$14,501	444	\$21,232	445	\$29,147	449	\$44,651	449	\$51,229
125	444	\$21,012	444	\$17,910	445	\$24,286	447	\$32,301	449	\$48,814	—	—
150	445	\$25,858	445	\$21,257	447	\$28,272	449	\$38,761	—	—	—	—
200	447	\$32,678	447	\$25,899	—	—	449	\$51,681	—	—	—	—
250	—	—	449	\$32,374	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* Maximum Rating For Each RPM Available As 1.0 S.F. Only.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



**Three Phase Modifiable
NEMA^{®†} Horizontal Motors
Totally Enclosed Fan Cooled (TEFC)
Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016**



FL Single Label

Hazardous Location, Division 1, Energy Efficient

- * Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power
- * 1.00 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class I Group D
- * Class I Group C&D
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed And CORRO-DUTY^{®†} Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$703	143	\$610	143	\$829	145	\$1,277	—	—	—	—
0.33	143	\$703	143	\$610	143	\$829	145	\$1,277	—	—	—	—
0.5	143	\$703	143	\$610	143	\$829	145	\$1,277	—	—	—	—
0.75	143	\$703	143	\$610	143	\$829	145	\$1,277	—	—	—	—
1	143	\$703	143	\$610	145	\$829	182	\$1,277	—	—	—	—
1.5	143	\$703	145	\$676	182	\$915	184	\$1,418	—	—	—	—
2	145	\$835	145	\$742	184	\$1,018	213	\$1,574	—	—	—	—
3	182	\$934	182	\$825	213	\$1,258	215	\$1,950	—	—	—	—
5	184	\$1,172	184	\$960	215	\$1,801	254	\$2,711	—	—	—	—
7.5	213	\$1,448	213	\$1,309	254	\$2,334	256	\$3,726	—	—	—	—
10	215	\$1,697	215	\$1,581	256	\$2,819	284	\$4,444	—	—	—	—
15	254	\$2,358	254	\$2,120	284	\$3,864	286	\$5,777	—	—	—	—
20	256	\$2,919	256	\$2,613	286	\$4,681	324	\$7,217	—	—	—	—
25	284	\$3,522	284	\$3,084	324	\$5,926	326	\$8,550	—	—	—	—
30	286	\$4,130	286	\$3,597	326	\$6,992	364	\$9,843	—	—	—	—
40	324	\$5,677	324	\$4,997	364	\$9,256	365	\$12,310	—	—	—	—
50	326	\$7,306	326	\$6,135	365	\$10,663	404	\$15,681	—	—	—	—
60	364	\$9,584	364	\$8,768	404	\$12,297	405	\$17,817	—	—	—	—
75	365	\$12,043	365	\$11,152	405	\$14,847	444	\$19,747	—	—	—	—
100	405	\$14,905	405	\$12,812	444	\$18,741	445	\$25,727	—	—	—	—
125	444	\$18,547	444	\$15,823	445	\$21,437	447	\$28,087	—	—	—	—
150	445	\$22,825	445	\$18,781	447	\$24,622	449	\$34,245	—	—	—	—
200	447	\$28,844	447	\$22,882	—	—	449	\$45,660	—	—	—	—
250	—	—	449	\$28,602	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* For Temperature Code T3 Or Lower, Use Dual Label.

* For 900, 720 Or 600 RPM, Use Standard Efficiency Or Premium Efficiency.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FL Dual Label

Hazardous Location, Division 1, Energy Efficient

- * Class F Insulation, Class B Rise At Full Load On
60 Hertz Sine Wave Power
- * 1.00 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class I Group D, Class II Group F&G (140-440 Frame)
- * Class I Group C&D, Class II Group F&G (250-400 Frame)
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed And CORRO-DUTY^{®†} Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$756	143	\$656	143	\$892	145	\$1,373	—	—	—	—
0.33	143	\$756	143	\$656	143	\$892	145	\$1,373	—	—	—	—
0.5	143	\$756	143	\$656	143	\$892	145	\$1,373	—	—	—	—
0.75	143	\$756	143	\$656	143	\$892	145	\$1,373	—	—	—	—
1	143	\$756	143	\$656	145	\$892	182	\$1,373	—	—	—	—
1.5	143	\$756	145	\$727	182	\$984	184	\$1,525	—	—	—	—
2	145	\$898	145	\$797	184	\$1,094	213	\$1,692	—	—	—	—
3	182	\$1,004	182	\$887	213	\$1,353	215	\$2,097	—	—	—	—
5	184	\$1,260	184	\$1,032	215	\$1,937	254	\$2,915	—	—	—	—
7.5	213	\$1,557	213	\$1,408	254	\$2,509	256	\$4,002	—	—	—	—
10	215	\$1,824	215	\$1,700	256	\$3,031	284	\$4,779	—	—	—	—
15	254	\$2,535	254	\$2,280	284	\$4,155	286	\$6,444	—	—	—	—
20	256	\$3,138	256	\$2,810	286	\$5,034	324	\$8,050	—	—	—	—
25	284	\$3,787	284	\$3,317	324	\$6,372	326	\$9,208	—	—	—	—
30	286	\$4,441	286	\$3,868	326	\$7,518	364	\$10,600	—	—	—	—
40	324	\$6,105	324	\$5,373	364	\$9,952	365	\$13,131	—	—	—	—
50	326	\$7,856	326	\$6,597	365	\$11,466	404	\$16,887	—	—	—	—
60	364	\$10,306	364	\$9,428	404	\$13,223	405	\$18,652	—	—	—	—
75	365	\$12,949	365	\$11,991	405	\$15,381	444	\$20,456	—	—	—	—
100	405	\$16,042	405	\$13,776	444	\$20,170	445	\$27,689	—	—	—	—
125	444	\$19,962	444	\$17,015	445	\$23,072	447	\$30,686	—	—	—	—
150	445	\$24,566	445	\$20,194	447	\$26,858	449	\$36,823	—	—	—	—
200	447	\$31,044	447	\$24,604	—	—	449	\$49,097	—	—	—	—
250	—	—	449	\$30,755	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* Maximum Rating For Each RPM Available As 1.0 S.F. Only.

* For 900, 720 Or 600 RPM, Use Standard Efficiency Or Premium Efficiency.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



L Single Label

Hazardous Location, Division 1, Standard Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class I, Group D (140-440 Frame)
- * Class I, Group C&D (250-400 Frame)
- * CORRO-DUTY^{®†} Available With Adder
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$625	143	\$542	143	\$737	145	\$1,135	—	—	—	—
0.33	143	\$625	143	\$542	143	\$737	145	\$1,135	—	—	—	—
0.5	143	\$625	143	\$542	143	\$737	145	\$1,135	—	—	—	—
0.75	143	\$625	143	\$542	143	\$737	145	\$1,135	—	—	—	—
1	143	\$625	143	\$542	145	\$737	182	\$1,135	213	\$1,533	215	\$1,993
1.5	143	\$625	145	\$601	182	\$813	184	\$1,260	213	\$1,701	254	\$2,212
2	145	\$743	145	\$659	184	\$905	213	\$1,399	215	\$1,888	256	\$2,455
3	182	\$830	182	\$734	213	\$1,118	215	\$1,734	254	\$2,340	284	\$3,042
5	184	\$1,042	184	\$853	215	\$1,601	254	\$2,410	256	\$3,253	286	\$4,229
7.5	213	\$1,287	213	\$1,164	254	\$2,074	256	\$3,312	284	\$4,472	324	\$6,540
10	215	\$1,508	215	\$1,405	256	\$2,506	284	\$3,951	324	\$6,000	326	\$7,800
15	254	\$2,096	254	\$1,885	284	\$3,435	286	\$5,136	326	\$7,800	364	\$10,139
20	256	\$2,594	256	\$2,323	286	\$4,161	324	\$6,837	364	\$9,231	365	\$12,000
25	284	\$3,131	284	\$2,742	324	\$5,614	326	\$8,100	365	\$10,935	405	\$14,215
30	286	\$3,671	286	\$3,198	326	\$6,624	364	\$9,325	405	\$12,589	405	\$16,365
40	324	\$5,379	324	\$4,734	364	\$8,768	365	\$11,662	405	\$15,744	445	\$20,467
50	326	\$6,921	326	\$5,812	365	\$10,102	404	\$14,855	445	\$20,055	445	\$26,071
60	364	\$9,080	364	\$8,306	404	\$11,650	405	\$16,879	445	\$22,787	447	\$29,623
75	365	\$11,409	365	\$10,565	405	\$14,066	444	\$18,708	447	\$25,255	449	\$32,832
100	405	\$14,120	405	\$12,137	444	\$17,755	445	\$24,373	449	\$32,903	449	\$42,774
125	444	\$17,571	444	\$14,991	445	\$20,309	447	\$26,608	449	\$35,921	—	—
150	445	\$21,623	445	\$17,792	447	\$23,326	449	\$32,443	—	—	—	—
200	447	\$27,326	447	\$21,677	449	\$30,556	449	\$34,537	—	—	—	—
250	449	\$32,547	449	\$27,097	449	\$33,358	—	—	—	—	—	—
300	449	\$41,568	449	\$31,581	—	—	—	—	—	—	—	—
350	449	\$47,334	—	—	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* For Temperature Code T3 Or Lower, Use Dual Label.

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



L Dual Label

Hazardous Location, Division 1, Standard Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.00 Service Factor
- * Cast Iron Frame And Endshields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End

- * Lifting Provisions And Regreasable Bearings 180 Frame And Up
- * Class I Group D, Class II Group F&G (140-440 Frame)
- * Class I Group C&D, Class II Group F&G (250-400 Frame)
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed And CORRO-DUTY^{®†} Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$672	143	\$583	143	\$793	145	\$1,221	—	—	—	—
0.33	143	\$672	143	\$583	143	\$793	145	\$1,221	—	—	—	—
0.5	143	\$672	143	\$583	143	\$793	145	\$1,221	—	—	—	—
0.75	143	\$672	143	\$583	143	\$793	145	\$1,221	—	—	—	—
1	143	\$672	143	\$583	145	\$793	182	\$1,221	213	\$1,648	215	\$2,143
1.5	143	\$672	145	\$646	182	\$874	184	\$1,355	213	\$1,830	254	\$2,378
2	145	\$798	145	\$709	184	\$973	213	\$1,504	215	\$2,030	256	\$2,640
3	182	\$893	182	\$789	213	\$1,202	215	\$1,864	254	\$2,516	284	\$3,271
5	184	\$1,120	184	\$918	215	\$1,722	254	\$2,591	256	\$3,498	286	\$4,548
7.5	213	\$1,384	213	\$1,251	254	\$2,230	256	\$3,558	284	\$4,803	324	\$7,024
10	215	\$1,622	215	\$1,511	256	\$2,694	284	\$4,248	324	\$6,452	326	\$8,387
15	254	\$2,254	254	\$2,026	284	\$3,694	286	\$5,728	326	\$8,700	364	\$11,309
20	256	\$2,790	256	\$2,498	286	\$4,474	324	\$7,626	364	\$10,296	365	\$13,384
25	284	\$3,366	284	\$2,948	324	\$6,036	326	\$8,723	365	\$11,776	405	\$15,309
30	286	\$3,947	286	\$3,438	326	\$7,123	364	\$10,042	405	\$13,557	405	\$17,624
40	324	\$5,783	324	\$5,090	364	\$9,428	365	\$12,440	405	\$16,794	445	\$21,832
50	326	\$7,442	326	\$6,250	365	\$10,862	404	\$15,998	445	\$21,598	445	\$28,077
60	364	\$9,763	364	\$8,932	404	\$12,527	405	\$17,670	445	\$23,855	447	\$31,011
75	365	\$12,268	365	\$11,360	405	\$14,571	444	\$19,379	447	\$26,162	449	\$34,011
100	405	\$15,197	405	\$13,051	444	\$19,109	445	\$26,232	449	\$35,413	449	\$46,037
125	444	\$18,911	444	\$16,119	445	\$21,858	447	\$29,071	449	\$39,245	—	—
150	445	\$23,273	445	\$19,131	447	\$25,445	449	\$34,885	—	—	—	—
200	447	\$29,411	447	\$23,309	—	—	449	\$46,513	—	—	—	—
250	—	—	449	\$29,136	—	—	—	—	—	—	—	—

* Must Specify Division, Class, Group And Temperature Code At Order Entry.

* Maximum Rating For Each RPM Available As 1.0 S.F. Only.

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Open Drip Proof (ODP)



DI,RI

Inverter Duty, Premium Efficient Variable Torque 20:1 (3-60 Hz) Speed Range Constant Torque 5:1 (12-60 Hz) Speed Range

- * Inverter Grade® Insulation System (Meets NEMA®† MG-1 Part 31)
- * Class F Insulation
- * 1.15 Service Factor On Sine Wave / 1.0 Service Factor On PWM
- * 56-320: Rolled Steel Frame, 360-440: Cast Iron Frame
- * 56-250: Aluminum Endshields, 280-440: Cast Iron Endshields
- * Lifting Provisions On 180 Frame And Up
- * Insulife 2000 Insulation Treatment

- * Class F Thermostats (One Per Phase)
- * Special Balance
- * Regreasable Bearings 210 Frame And Up
- * Insulated Shaft ODE 400 Frame & Up
- * Close Coupled Pump (CCP) Available With Adder
- * Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$557	143	\$525	143	\$702	143	\$809	-	-	-	-
0.33	143	\$557	143	\$525	143	\$702	143	\$809	-	-	-	-
0.5	143	\$557	143	\$525	143	\$702	143	\$809	-	-	-	-
0.75	143	\$557	143	\$525	143	\$702	145	\$809	-	-	-	-
1	143	\$557	143	\$525	145	\$702	182	\$809	184	\$1,092	215	\$1,420
1.5	143	\$557	145	\$550	182	\$708	184	\$982	215	\$1,326	254	\$1,724
2	145	\$608	145	\$604	184	\$793	213	\$1,320	215	\$1,782	256	\$2,317
3	145	\$624	182	\$642	213	\$1,009	215	\$1,693	254	\$2,285	284	\$2,971
5	182	\$667	184	\$691	215	\$1,324	254	\$2,171	256	\$2,930	286	\$3,810
7.5	184	\$1,038	213	\$1,011	254	\$1,679	256	\$2,761	286	\$3,728	324	\$4,846
10	213	\$1,214	215	\$1,231	256	\$2,184	284	\$3,275	324	\$4,422	326	\$5,748
15	215	\$1,669	254	\$1,683	284	\$2,788	286	\$4,304	326	\$5,811	364	\$7,554
20	254	\$2,019	256	\$2,158	286	\$3,398	324	\$5,093	364	\$6,876	365	\$8,939
25	256	\$2,640	284	\$2,613	324	\$3,732	326	\$6,033	365	\$8,145	404	\$10,588
30	284	\$3,033	286	\$3,023	326	\$4,173	364	\$6,687	404	\$9,028	405	\$11,736
40	286	\$3,315	324	\$3,322	364	\$6,654	365	\$8,284	405	\$11,183	444	\$14,538
50	324	\$3,729	326	\$3,894	365	\$7,492	404	\$9,869	444	\$13,323	445	\$17,320
60	326	\$5,005	364	\$5,216	404	\$8,631	405	\$11,443	445	\$15,448	445	\$20,083
75	364	\$6,592	365	\$6,176	405	\$9,715	444	\$13,765	445	\$18,582	447	\$24,157
100	365	\$7,280	404	\$7,360	444	\$11,507	445	\$19,411	447	\$26,205	449	\$34,067
125	404	\$9,490	405	\$9,530	445	\$12,096	445	\$20,156	449	\$27,210	-	-
150	405	\$11,710	444	\$12,460	445	\$16,294	447	\$22,741	-	-	-	-
200	444	\$15,170	445	\$15,572	447	\$21,417	449	\$24,286	-	-	-	-
250	445	\$19,994	447	\$17,605	449	\$26,595	449	\$32,849	-	-	-	-
300	447	\$27,592	447	\$23,063	449	\$32,446	-	-	-	-	-	-
350	447	\$31,455	449	\$31,134	-	-	-	-	-	-	-	-
400	449	\$36,802	449	\$36,427	-	-	-	-	-	-	-	-
450	-	-	449	\$38,934	-	-	-	-	-	-	-	-

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFOM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



UTI

UNIMOUNT[®] Inverter Duty, Premium Efficient - IE3 Variable Torque 20:1 (3-60 Hz) Speed Range Constant Torque 5:1 (12-60 Hz) Speed Range

* Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)

* Class F Insulation

* 1.25 Service Factor On Sine Wave / 1.0 Service Factor On PWM

* 56-140: Rolled Steel Frame Construction

* 180-280: Extruded Aluminum Frame Construction

* Aluminum End Shields With Steel Bearing Inserts

* Lifting Provisions On 180 Frame And Up

* Removable Base On 180 Frame And Up

* Class F Thermostats (One Per Phase)

* Regreasable Bearings Shaft End On 180 Frame And Up

* Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$660	143	\$573	143	\$779	145	\$1,206	—	—	—	—
0.33	143	\$660	143	\$573	143	\$779	145	\$1,206	—	—	—	—
0.5	143	\$660	143	\$573	143	\$779	145	\$1,206	—	—	—	—
0.75	143	\$660	143	\$573	143	\$779	145	\$1,206	—	—	—	—
1	143	\$660	143	\$573	145	\$779	182	\$1,206	213	\$1,629	215	\$2,117
1.5	143	\$660	145	\$635	182	\$864	184	\$1,339	213	\$1,807	254	\$2,349
2	145	\$784	145	\$696	184	\$961	213	\$1,490	215	\$2,012	256	\$2,616
3	182	\$882	182	\$780	213	\$1,191	215	\$1,847	254	\$2,493	—	—
5	184	\$1,106	184	\$906	215	\$1,705	254	\$2,644	256	\$3,569	—	—
7.5	213	\$1,371	213	\$1,240	254	\$2,276	256	\$3,527	—	—	—	—
10	215	\$1,607	215	\$1,497	256	\$2,749	—	—	—	—	—	—
15	254	\$2,299	254	\$2,068	—	—	—	—	—	—	—	—
20	256	\$2,846	256	\$2,548	—	—	—	—	—	—	—	—
25	284	\$3,491	284	\$3,057	—	—	—	—	—	—	—	—
30	—	—	286	\$3,566	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Hostile Duty.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B - Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



UTI

UNIMOUNT[®] Inverter Duty, Premium Efficient - IE3 Constant Torque 20:1 (3-60 Hz) Speed Range

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation
- * 56-140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts

- * Lifting Provisions On 180 Frame And Up
- * Removable Base On 180 Frame And Up
- * Class F Thermostats (One Per Phase)
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.33	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.5	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.75	143	\$718	143	\$623	145	\$846	182	\$1,311	—	—	—	—
1	143	\$718	145	\$623	182	\$846	184	\$1,311	213	\$1,770	254	\$2,301
1.5	145	\$718	145	\$690	184	\$939	213	\$1,455	215	\$1,964	256	\$2,554
2	145	\$853	145	\$756	213	\$1,045	215	\$1,620	254	\$2,187	—	—
3	182	\$959	182	\$848	213	\$1,295	254	\$2,008	256	\$2,710	—	—
5	184	\$1,203	184	\$985	215	\$1,854	256	\$2,874	—	—	—	—
7.5	213	\$1,490	213	\$1,348	254	\$2,474	—	—	—	—	—	—
10	215	\$1,746	215	\$1,628	—	—	—	—	—	—	—	—
15	254	\$2,499	254	\$2,248	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Hostile Duty.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Non-Vent (TENV)



UTNI

ACCU-Torq[®] Vector Duty, Premium Efficient - IE3 Constant Torque 5000:1, C-Face

- * Constant Torque Operation From Zero To Base Speed With Vector Drives
- * Constant HP Operation To Twice Base Speed
- * Continuous Duty At 40°C Ambient
- * NEMA^{®†} Design-A
- * Class F Insulation
- * Class F Thermostats (One Per Phase)
- * Shaft Grounding Ring

- * F-1 Standard, Field Convertible To F-2 On 180 Frame And Above
- * Removable Base 180 Frame And Above
- * Steel 56-140 Frame; Aluminum On 180 Frame And Above
- * Encoder And Brake Provision On All Ratings
- * D-Flange Convertible Kit
- * Three Year Warranty

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	145	\$832	145	\$722	143	\$982	145	\$1,355	—	—	—	—
0.33	145	\$832	145	\$722	143	\$982	145	\$1,355	—	—	—	—
0.5	145	\$832	145	\$722	143	\$982	145	\$1,355	—	—	—	—
0.75	145	\$832	145	\$722	145	\$982	182	\$1,355	—	—	—	—
1	145	\$832	145	\$722	145	\$982	182	\$1,355	213	\$1,829	254	\$2,377
1.5	145	\$832	145	\$819	182	\$1,089	184	\$1,503	215	\$2,029	256	\$2,637
2	145	\$989	145	\$877	184	\$1,212	213	\$1,673	254	\$2,258	—	—
3	182	\$1,112	182	\$983	213	\$1,502	215	\$2,073	256	\$2,799	—	—
5	184	\$1,395	184	\$1,143	215	\$2,150	254	\$2,967	—	—	—	—
7.5	213	\$1,728	213	\$1,563	254	\$2,870	256	\$3,960	—	—	—	—
10	215	\$2,026	215	\$1,888	256	\$3,466	—	—	—	—	—	—
15	—	—	254	\$2,607	—	—	—	—	—	—	—	—
20	—	—	256	\$3,213	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



CTI

World Motor - Hostile Duty, Inverter Duty, Premium Efficient - IE3

Variable Torque 20:1 (3-60 Hz) Speed Range

Constant Torque 5:1 (12-60 Hz) Speed Range

* Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)

* IP54 Ingress Protection

* 1.15 Service Factor On Sine Wave / 1.0 Service Factor On PWM

* Class F Insulation

* Special Balance (0.08 IPS)

* Cast Iron Frame and End Shields

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* Shaft Slinger On Pulley End For IP54 Protection

* Lifting Provisions

* Regreasable Bearings On 250 Frame And Up

* Class F Thermostats (One Per Phase)

* Internal Shaft Grounding Ring

* CORRO-DUTY[®] Available With Adder

* Air-Over (TEAO) Available With Deduct

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$590	143	\$530	143	\$676	145	\$966	—	—	—	—
0.33	143	\$590	143	\$530	143	\$676	145	\$966	—	—	—	—
0.5	143	\$590	143	\$530	143	\$676	145	\$966	—	—	—	—
0.75	143	\$590	143	\$530	143	\$676	145	\$966	—	—	—	—
1	143	\$590	143	\$530	145	\$676	182	\$966	213	\$1,165	215	\$1,514
1.5	143	\$590	145	\$566	182	\$761	184	\$1,179	213	\$1,422	254	\$1,867
2	145	\$613	145	\$622	184	\$868	213	\$1,202	215	\$1,640	256	\$2,090
3	182	\$712	182	\$679	213	\$1,081	215	\$1,676	254	\$2,242	284	\$2,801
5	184	\$844	184	\$774	215	\$1,395	254	\$2,184	256	\$2,779	286	\$3,676
7.5	213	\$1,099	213	\$1,055	254	\$1,873	256	\$2,847	284	\$3,759	324	\$4,803
10	215	\$1,281	215	\$1,313	256	\$2,226	284	\$3,316	324	\$4,700	326	\$5,921
15	254	\$1,803	254	\$1,757	284	\$2,941	286	\$4,339	326	\$5,209	364	\$6,772
20	256	\$2,235	256	\$2,186	286	\$3,616	324	\$5,243	364	\$6,294	365	\$8,182
25	284	\$2,658	284	\$2,571	324	\$4,619	326	\$6,060	365	\$8,181	405	\$10,635
30	286	\$3,188	286	\$3,053	326	\$5,254	364	\$6,775	405	\$9,146	405	\$11,890
40	324	\$3,758	324	\$3,644	364	\$5,821	365	\$8,441	405	\$11,395	445	\$14,814
50	326	\$5,036	326	\$4,524	365	\$7,239	404	\$10,497	445	\$14,171	445	\$18,422
60	364	\$6,476	364	\$6,330	404	\$8,517	405	\$11,498	445	\$15,522	447	\$20,179
75	365	\$8,339	365	\$7,728	405	\$10,133	444	\$13,679	447	\$18,467	449	\$26,636
100	405	\$11,178	405	\$10,133	444	\$13,603	445	\$18,365	449	\$24,376	—	—
125	444	\$13,997	444	\$13,146	445	\$16,895	447	\$22,808	—	—	—	—
150	445	\$17,743	445	\$15,831	447	\$19,320	449	\$30,107	—	—	—	—
200	447	\$24,249	447	\$20,503	449	\$25,529	—	—	—	—	—	—
250	449	\$29,682	449	\$26,366	—	—	—	—	—	—	—	—
300	449	\$35,486	449	\$30,461	—	—	—	—	—	—	—	—
350	—	—	449	\$33,210	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-HDMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



CTI

Hostile Duty, Inverter Duty, Premium Efficient - IE3 Constant Torque 20:1 (3-60 Hz) Speed Range

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation
- * NEMA^{®†} Design A
- * Special Balance
- * Cast Iron Frame Construction (140: Rolled Steel)
- * Cast Iron End Shields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware

- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions On 180 Frame And Up
- * Class F Thermostats (One Per Phase)
- * Insulated Shaft ODE 400 Frame & Up
- * CORRO-DUTY[®] Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Close Coupled Pump (CCP) Available With Adder
- * Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.33	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.5	143	\$718	143	\$623	143	\$846	145	\$1,311	—	—	—	—
0.75	143	\$718	143	\$623	145	\$846	182	\$1,311	—	—	—	—
1	143	\$718	145	\$623	182	\$846	184	\$1,311	213	\$1,770	254	\$2,301
1.5	145	\$718	145	\$690	184	\$939	213	\$1,455	215	\$1,964	256	\$2,554
2	182	\$853	182	\$756	213	\$1,045	215	\$1,620	254	\$2,187	284	\$2,843
3	182	\$959	182	\$848	213	\$1,295	254	\$2,008	256	\$2,710	286	\$3,523
5	184	\$1,203	184	\$985	215	\$1,854	256	\$2,874	284	\$3,880	324	\$5,043
7.5	213	\$1,490	213	\$1,348	254	\$2,474	284	\$3,834	324	\$5,176	326	\$6,728
10	215	\$1,746	215	\$1,628	256	\$2,988	286	\$4,616	326	\$6,232	364	\$8,102
15	254	\$2,499	254	\$2,248	284	\$4,164	324	\$6,173	364	\$8,333	365	\$10,833
20	256	\$3,094	256	\$2,770	286	\$5,044	326	\$7,305	365	\$9,862	405	\$12,820
25	284	\$3,795	284	\$3,324	324	\$6,001	364	\$8,654	404	\$11,683	405	\$15,187
30	286	\$4,450	286	\$3,876	326	\$7,081	365	\$9,963	405	\$13,449	445	\$17,484
40	324	\$5,750	324	\$5,061	364	\$9,538	404	\$12,341	445	\$16,661	445	\$21,659
50	326	\$7,399	326	\$6,214	365	\$10,988	405	\$15,871	445	\$21,426	447	\$27,854
60	364	\$9,876	364	\$9,035	404	\$12,945	444	\$18,315	447	\$24,725	—	—
75	365	\$12,404	365	\$11,491	405	\$15,263	445	\$20,299	—	—	—	—
100	405	\$16,620	405	\$14,161	444	\$20,898	447	\$28,688	—	—	—	—
125	444	\$20,681	444	\$17,628	445	\$23,904	—	—	—	—	—	—
150	445	\$25,451	445	\$20,923	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Blower Cooled (TEBC)



CORRO-DUTY[®], Inverter Duty, Premium Efficient - IE3 Constant Torque 5000:1 Speed Range

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation, 1.00 Service Factor (On PWM)
- * Special Balance
- * Cast Iron Frame Construction (140: Rolled Steel)
- * Cast Iron End Shields
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware

- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Class F Thermostats (One Per Phase)
- * Insulated Shaft ODE 400 Frame & Up
- * Close Coupled Pump (CCP) Available With Adder
- * Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	—	—	—	—	—	—	—	—	—	—	—	—
0.33	—	—	—	—	—	—	—	—	—	—	—	—
0.5	—	—	—	—	—	—	—	—	—	—	—	—
0.75	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	182	\$2,066	213	\$2,562	215	\$3,093
1.5	—	—	—	—	182	\$1,694	184	\$2,210	213	\$2,756	254	\$3,387
2	—	—	—	—	184	\$1,800	213	\$2,412	215	\$2,979	256	\$3,676
3	182	\$1,714	182	\$1,603	213	\$2,087	215	\$2,800	254	\$3,543	284	\$4,431
5	184	\$1,958	184	\$1,740	215	\$2,646	254	\$3,707	256	\$4,713	286	\$5,951
7.5	213	\$2,282	213	\$2,140	254	\$3,307	256	\$4,667	284	\$6,084	324	\$7,799
10	215	\$2,538	215	\$2,420	256	\$3,821	284	\$5,524	324	\$7,303	326	\$9,173
15	254	\$3,332	254	\$3,081	284	\$5,072	286	\$7,081	326	\$9,404	364	\$11,976
20	256	\$3,927	256	\$3,603	286	\$5,952	324	\$8,376	364	\$11,005	365	\$13,963
25	284	\$4,703	284	\$4,232	324	\$7,072	326	\$9,725	365	\$12,826	405	\$16,449
30	286	\$5,358	286	\$4,784	326	\$8,152	364	\$11,106	405	\$14,711	405	\$18,746
40	324	\$6,821	324	\$6,132	364	\$10,681	365	\$13,484	405	\$17,923	445	\$23,020
50	326	\$8,470	326	\$7,285	365	\$12,131	404	\$17,133	445	\$22,787	445	\$29,215
60	364	\$11,019	364	\$10,178	404	\$14,207	405	\$19,577	445	\$26,086	447	\$33,545
75	365	\$13,547	365	\$12,634	405	\$16,525	444	\$21,660	447	\$28,806	—	—
100	405	\$17,882	405	\$15,423	444	\$22,259	445	\$30,049	—	—	—	—
125	444	\$22,042	444	\$18,989	445	\$25,265	447	\$32,721	—	—	—	—
150	445	\$26,812	445	\$22,284	447	\$28,857	—	—	—	—	—	—
200	447	\$33,566	447	\$26,893	—	—	—	—	—	—	—	—

* Refer To Page A1 For Blower Performance Data.

* 30:1 CT on Open Loop Vector Drives. Speed Range May Be Limited On Other Drive Types.

* For Vector Duty With Encoder, Use Base List Price + Encoder Adder.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Non-Vent (TENV)



CTNI

Hostile Duty, Inverter Duty, Premium Efficient - IE3 Constant Torque 5000:1 Speed Range

* Inverter Grade[®] Insulation System
(Meets NEMA^{®†} MG-1 Part 31)

* Class F Insulation

* 1.0 Service Factor (On PWM)

* Special Balance

* Cast Iron Frame Construction (140: Rolled Steel)

* Cast Iron End Shields

* Corrosion Resistant Mill And Chemical Duty Paint

* Stainless Steel Nameplate And Zinc Plated Hardware

* Shaft Slinger On Pulley End For IP54 Protection

* Lifting Provisions And Regreasable Bearings On 180 Frame And Up

* Class F Thermostats (One Per Phase)

* CORRO-DUTY[®] Available With Adder

* Close Coupled Pump (CCP) Available With Adder

* Shaft Grounding Ring

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	145	\$775	145	\$672	143	\$914	145	\$1,416	—	—	—	—
0.33	145	\$775	145	\$672	143	\$914	145	\$1,416	—	—	—	—
0.5	145	\$775	145	\$672	143	\$914	145	\$1,416	—	—	—	—
0.75	145	\$775	145	\$672	145	\$914	182	\$1,416	—	—	—	—
1	145	\$775	145	\$672	145	\$914	182	\$1,416	213	\$1,912	254	\$2,485
1.5	182	\$775	145	\$745	182	\$1,014	184	\$1,571	215	\$2,121	256	\$2,758
2	184	\$921	182	\$817	184	\$1,129	213	\$1,750	254	\$2,362	284	\$3,071
3	215	\$1,035	184	\$915	213	\$1,399	215	\$2,168	256	\$2,927	286	\$3,805
5	215	\$1,299	213	\$1,064	215	\$2,002	254	\$3,104	284	\$4,190	—	—
7.5	254	\$1,609	215	\$1,455	254	\$2,672	256	\$4,140	286	\$5,590	—	—
10	256	\$1,886	254	\$1,758	256	\$3,227	284	\$4,986	324	\$6,730	—	—
15	284	\$2,699	256	\$2,427	284	\$4,497	286	\$6,666	—	—	—	—
20	—	—	284	\$2,992	286	\$5,447	324	\$7,889	—	—	—	—
25	—	—	286	\$3,590	324	\$6,481	—	—	—	—	—	—
30	—	—	324	\$4,186	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Hostile Duty.

* For Vector Duty With Encoder, Use Base List Price + Encoder Adder.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TENV)



LI Single Label

Hazardous Location Inverter Duty, Premium Efficient - IE3 Variable Torque 10:1 (6-60 Hz) & Constant Torque 5:1 (12-60 Hz) Class I, Division 1

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation, 1.00 Service Factor (On PWM)
- * Insulife 2000 Insulation Treatment
- * Cast Iron Frame And Endshields
- * Special Balance
- * Class F Thermostats (One Per Phase)
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End
- * 143-215 And 444-449 Frame: Class I Group D
- * 254-405 Frame: Class I Group C&D

- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Insulated Shaft ODE 400 Frame & Up
- * Internal Shaft Grounding Ring
- * Close Coupled Pump (CCP) Available With Adder
- * CORRO-DUTY[®] Available With Adder
- * VT 10:1 / CT 5:1 T2B T-Code (1.15 S.F. sine wave / 1.0 S.F. VFD duty)
- * VT 10:1 (ONLY) T3C T-Code (1.0 S.F. sine wave / 1.0 S.F. VFD duty)

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$1,257	143	\$1,065	143	\$1,200	145	\$1,750	—	—	—	—
0.33	143	\$1,257	143	\$1,065	143	\$1,200	145	\$1,750	—	—	—	—
0.5	143	\$1,257	143	\$1,065	143	\$1,200	145	\$1,750	—	—	—	—
0.75	143	\$1,257	143	\$1,065	143	\$1,200	145	\$1,750	—	—	—	—
1	143	\$1,257	143	\$1,065	145	\$1,200	182	\$1,750	—	—	—	—
1.5	143	\$1,319	145	\$1,069	182	\$1,695	184	\$1,816	—	—	—	—
2	145	\$1,543	145	\$1,192	184	\$1,842	213	\$2,011	—	—	—	—
3	182	\$1,691	182	\$1,314	213	\$2,067	215	\$2,492	—	—	—	—
5	184	\$2,048	184	\$1,541	215	\$2,496	254	\$3,464	—	—	—	—
7.5	213	\$2,436	213	\$1,870	254	\$3,026	256	\$4,762	—	—	—	—
10	215	\$2,719	215	\$2,195	256	\$3,589	284	\$5,679	—	—	—	—
15	254	\$3,410	254	\$2,900	284	\$4,938	286	\$7,382	—	—	—	—
20	256	\$4,145	256	\$3,420	286	\$5,982	324	\$8,737	—	—	—	—
25	284	\$5,106	284	\$4,016	324	\$7,173	326	\$10,350	—	—	—	—
30	286	\$5,654	286	\$4,658	326	\$8,464	364	\$11,915	—	—	—	—
40	324	\$7,896	324	\$6,145	364	\$11,204	365	\$14,901	—	—	—	—
50	326	\$9,517	326	\$7,498	365	\$12,908	404	\$18,982	—	—	—	—
60	364	\$11,927	364	\$10,623	404	\$14,886	405	\$21,568	—	—	—	—
75	365	\$14,539	365	\$13,449	405	\$17,973	444	\$23,904	—	—	—	—
100	405	\$18,056	405	\$15,506	444	\$22,686	445	\$31,143	—	—	—	—
125	444	\$22,364	444	\$19,158	445	\$25,950	447	\$34,000	—	—	—	—
150	445	\$27,835	445	\$22,684	447	\$29,805	449	\$41,455	—	—	—	—
200	447	\$34,333	447	\$27,648	449	\$38,729	449	\$55,273	—	—	—	—
250	449	\$41,667	449	\$33,606	449	\$48,411	—	—	—	—	—	—
300	449	\$47,980	449	\$41,327	—	—	—	—	—	—	—	—

* For T3 Temperature Code, See Dual Label.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



LI Dual Label

Hazardous Location Inverter Duty, Premium Efficient - IE3 Division 1, Class I & II, T3C

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation, 1.00 Service Factor (On PWM)
- * Insulife 2000 Insulation Treatment
- * Cast Iron Frame And Endshields
- * Special Balance
- * Class F Thermostats (One Per Phase)
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End
- * Variable Torque 10:1
- * 143-215 Frame: Constant Torque 6:1, Group D, F & G, T3C
- * 254-405 Frame: Constant Torque 4:1, Group C & D, F & G, T3C

- * 444-449 Frame: Constant Torque 4:1, Group C & D, F & G, T3C
- * All Frame: Constant Torque 10:1, T2B
- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Insulated Shaft ODE 400 Frame & Up
- * Internal Shaft Grounding Ring
- * Close Coupled Pump (CCP) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * CORRO-DUTY[®] Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$966	143	\$838	143	\$1,140	145	\$1,755	—	—	—	—
0.33	143	\$966	143	\$838	143	\$1,140	145	\$1,755	—	—	—	—
0.5	143	\$966	143	\$838	143	\$1,140	145	\$1,755	—	—	—	—
0.75	143	\$966	143	\$838	143	\$1,140	145	\$1,755	—	—	—	—
1	143	\$966	143	\$838	145	\$1,140	182	\$1,755	—	—	—	—
1.5	143	\$966	145	\$929	182	\$1,257	184	\$1,948	—	—	—	—
2	145	\$1,148	145	\$1,019	184	\$1,398	213	\$2,162	—	—	—	—
3	182	\$1,283	182	\$1,134	213	\$1,728	215	\$2,680	—	—	—	—
5	184	\$1,610	184	\$1,319	215	\$2,475	254	\$3,563	—	—	—	—
7.5	213	\$1,990	213	\$1,799	254	\$3,067	256	\$4,892	—	—	—	—
10	215	\$2,331	215	\$2,172	256	\$3,705	284	\$5,841	—	—	—	—
15	254	\$3,099	254	\$2,786	284	\$5,079	286	\$7,876	—	—	—	—
20	256	\$3,836	256	\$3,434	286	\$6,152	324	\$9,321	—	—	—	—
25	284	\$4,629	284	\$4,054	324	\$7,378	326	\$10,661	—	—	—	—
30	286	\$5,427	286	\$4,728	326	\$8,705	364	\$12,274	—	—	—	—
40	324	\$7,069	324	\$6,222	364	\$11,524	365	\$15,204	—	—	—	—
50	326	\$9,096	326	\$7,638	365	\$13,276	404	\$18,665	—	—	—	—
60	364	\$11,933	364	\$10,916	404	\$14,615	405	\$20,616	—	—	—	—
75	365	\$14,994	365	\$13,884	405	\$17,000	444	\$22,610	—	—	—	—
100	405	\$17,730	405	\$15,226	444	\$22,294	445	\$30,604	—	—	—	—
125	444	\$22,063	444	\$18,806	445	\$25,500	447	\$33,916	—	—	—	—
150	445	\$27,151	445	\$22,320	447	\$29,686	449	\$40,699	—	—	—	—
200	447	\$34,312	447	\$27,194	—	—	449	\$54,265	—	—	—	—
250	—	—	449	\$33,993	—	—	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—

* For T3 Temperature Code, See Dual Label.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Blower Cooled (TEBC)



LI Dual Label

Hazardous Location Inverter Duty, Premium Efficient - IE3 Division 1, Class I & II, T3C

- * Inverter Grade[®] Insulation System (Meets NEMA^{®†} MG-1 Part 31)
- * Class F Insulation, 1.00 Service Factor (On PWM)
- * Insulife 2000 Insulation Treatment
- * Cast Iron Frame And Endshields
- * Special Balance
- * Class F Thermostats (One Per Phase)
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End
- * 143-215 Frame: Constant Torque 10:1, Group D, F & G, T3C

- * 254-449 Frame: Constant Torque 6:1, Group C & D, F & G, T3C
- * Lifting Provisions And Regreasable Bearings On 180 Frame And Up
- * Insulated Shaft ODE 400 Frame & Up
- * Internal Shaft Grounding Ring
- * Close Coupled Pump (CCP) Available With Adder
- * CORRO-DUTY[®] Available With Adder

Ratings on standard frame size

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
1	—	—	—	—	—	—	182	\$2,194	—	—	—	—
1.5	—	—	—	—	182	\$1,697	184	\$2,435	—	—	—	—
2	—	—	—	—	184	\$1,888	213	\$2,703	—	—	—	—
3	182	\$1,733	182	\$1,531	213	\$2,161	215	\$3,349	—	—	—	—
5	184	\$2,013	184	\$1,781	215	\$3,094	254	\$4,097	—	—	—	—
7.5	213	\$2,487	213	\$2,248	254	\$3,527	256	\$5,625	—	—	—	—
10	215	\$2,914	215	\$2,715	256	\$4,261	284	\$6,717	—	—	—	—
15	254	\$3,564	254	\$3,204	284	\$5,841	286	\$9,057	—	—	—	—
20	256	\$4,411	256	\$3,949	286	\$7,075	324	\$9,787	—	—	—	—
25	284	\$5,323	284	\$4,662	324	\$7,747	326	\$11,194	—	—	—	—
30	286	\$6,242	286	\$5,437	326	\$9,141	364	\$12,887	—	—	—	—
40	324	\$7,422	324	\$6,533	364	\$12,100	365	\$15,964	—	—	—	—
50	326	\$9,551	326	\$8,020	365	\$13,940	404	\$19,598	—	—	—	—
60	364	\$12,529	364	\$11,462	404	\$15,346	405	\$21,646	—	—	—	—
75	365	\$15,744	365	\$14,578	405	\$17,849	444	\$23,740	—	—	—	—
100	405	\$18,617	405	\$15,987	444	\$23,408	445	\$32,135	—	—	—	—
125	444	\$23,166	444	\$19,746	445	\$26,775	447	\$35,612	—	—	—	—
150	445	\$28,508	445	\$23,436	447	\$31,170	449	\$42,734	—	—	—	—
200	447	\$36,027	447	\$28,554	—	—	449	\$56,978	—	—	—	—
250	—	—	449	\$35,692	—	—	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—

* Currently, Dual Label Inverter Duty Hazardous Location Not Available Above 326 Frame.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-VFM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



JDE

World Motor Automotive Duty "U" Frame Premium Efficient - IE3

- * Designed To Meet GM® 7EH, Ford® EM-1 And Chrysler® NPEM - 105
- * Rated 1.15 S.F./40°C Ambient And 1.00 S.F./65°C Ambient
- * Cast Iron Frame, End Shields And Conduit Box
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions And Regreaseable Bearings On 180 Frame And Up

- * Class F Insulation, Class A Rise At Full Load
- * Special Balance
- * Self-Certified Division 2 Available With Adder
- * Inverter Duty Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Non-Vent (TENV) Available With Adder
- * Close Coupled Pump (CCP) Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	182	\$896	182	\$1,049	182	\$1,281	184	\$1,335	—	—	—	—
0.33	182	\$896	182	\$1,049	182	\$1,281	184	\$1,335	—	—	—	—
0.5	182	\$896	182	\$1,049	182	\$1,281	184	\$1,335	—	—	—	—
0.75	182	\$896	182	\$1,049	184	\$1,281	213	\$1,367	—	—	—	—
1	182	\$896	182	\$1,049	184	\$1,281	213	\$1,620	—	—	—	—
1.5	182	\$896	184	\$1,123	184	\$1,413	213	\$1,769	—	—	—	—
2	184	\$990	184	\$1,184	213	\$1,566	215	\$1,854	—	—	—	—
3	184	\$1,123	213	\$1,361	215	\$1,938	254	\$2,452	—	—	—	—
5	213	\$1,334	215	\$1,803	254	\$2,698	256	\$3,314	—	—	—	—
7.5	215	\$1,622	254	\$2,371	256	\$3,448	284	\$4,228	—	—	—	—
10	254	\$1,942	256	\$2,881	284	\$4,226	286	\$4,970	—	—	—	—
15	256	\$2,474	284	\$3,957	324	\$5,690	326	\$6,608	—	—	—	—
20	286	\$3,365	286	\$4,860	326	\$6,954	364	\$8,008	—	—	—	—
25	324	\$4,317	324	\$6,083	364	\$8,396	365	\$9,387	—	—	—	—
30	326	\$5,207	326	\$7,107	365	\$9,501	404	\$11,114	—	—	—	—
40	364	\$6,796	364	\$9,370	404	\$12,237	405	\$13,605	—	—	—	—
50	365	\$8,579	365	\$10,992	405	\$14,137	444	\$16,378	—	—	—	—
60	405	\$10,206	405	\$13,649	444	\$16,597	445	\$18,835	—	—	—	—
75	444	\$13,409	444	\$16,834	445	\$19,679	445	\$32,365	—	—	—	—
100	445	\$17,722	445	\$20,925	445	\$24,215	—	—	—	—	—	—
125	447	\$38,942	445	\$22,969	447	\$29,603	—	—	—	—	—	—
150	447	\$46,845	447	\$27,121	—	—	—	—	—	—	—	—

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3ADE

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



Automotive Duty Hazardous Location "U" Frame Premium Efficient - IE3

EADE Single & Dual Label

- * Designed To Meet GM^{®†} 7EH, Ford^{®†} EM-1 And Chrysler^{®†} NPEM - 105
- * Rated 1.15 S.F./40°C Ambient And 1.00 S.F./65°C Ambient
- * Cast Iron Frame, End Shields And Conduit Box
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Shaft Slinger On Pulley End For IP54 Protection

- * Lifting Provisions And Regreaseable Bearings On 180 Frame And Up
- * Single Label: Class I, Group D, T2B Temp Code
- * Dual Label: Class I, Group D, Class II Group F&G, T3B Temp Code
- * Close Coupled Pump (CCP) Available With Adder
- * Multi-Speed And CORRO-DUTY[®] Available With Adder
- * Air-Over (TEAO) Available With Deduct, Non-Vent (TENV) Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	182	\$2,261	182	\$2,227	182	\$2,546	184	\$3,207	—	—	—	—
0.33	182	\$2,261	182	\$2,227	182	\$2,546	184	\$3,207	—	—	—	—
0.5	182	\$2,261	182	\$2,227	182	\$2,546	184	\$3,207	—	—	—	—
0.75	182	\$2,261	182	\$2,227	184	\$2,546	213	\$3,207	—	—	—	—
1	182	\$2,261	182	\$2,227	184	\$2,546	213	\$3,207	—	—	—	—
1.5	182	\$2,261	184	\$2,369	184	\$2,656	213	\$3,850	—	—	—	—
2	184	\$2,476	184	\$2,510	213	\$2,791	215	\$5,012	—	—	—	—
3	184	\$2,746	213	\$2,666	215	\$3,578	254	\$5,913	—	—	—	—
5	213	\$3,103	215	\$2,922	254	\$4,421	256	\$7,918	—	—	—	—
7.5	215	\$3,958	254	\$3,813	256	\$5,765	284	\$9,310	—	—	—	—
10	254	\$4,328	256	\$4,439	284	\$6,683	286	\$11,528	—	—	—	—
15	256	\$5,630	284	\$5,472	324	\$8,909	326	\$13,901	—	—	—	—
20	286	\$6,821	286	\$6,549	326	\$10,390	364	\$16,557	—	—	—	—
25	324	\$8,453	324	\$7,997	364	\$12,580	365	\$19,078	—	—	—	—
30	326	\$9,115	326	\$9,086	365	\$14,720	404	\$22,711	—	—	—	—
40	364	\$11,758	364	\$11,826	404	\$19,118	405	\$27,272	—	—	—	—
50	365	\$15,195	365	\$14,404	405	\$21,716	444	\$33,148	—	—	—	—
60	405	\$21,657	405	\$20,927	444	\$25,883	445	\$37,646	—	—	—	—
75	444	\$25,094	444	\$25,742	445	\$30,105	—	—	—	—	—	—
100	445	\$33,948	445	\$31,655	—	—	—	—	—	—	—	—
125	447	\$48,330	445	\$46,369	—	—	—	—	—	—	—	—
150	—	—	447	\$52,149	—	—	—	—	—	—	—	—

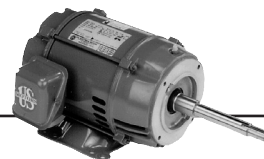
* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CXM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Open Drip Proof (ODP)



Close Coupled Pump Motors (JP, JM, JPY & JPZ) Premium Efficient

DE, RE (CCP)

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 140-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction

- * 140-250: Aluminum End Shields
- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$519	143	\$487	143	\$655	143	\$754	—	—	—	—
0.33	143	\$519	143	\$487	143	\$655	143	\$754	—	—	—	—
0.5	143	\$519	143	\$487	143	\$655	143	\$754	—	—	—	—
0.75	143	\$519	143	\$487	143	\$655	145	\$754	—	—	—	—
1	143	\$519	143	\$487	145	\$655	182	\$754	184	\$1,018	215	\$1,324
1.5	143	\$519	145	\$513	182	\$660	184	\$916	215	\$1,236	254	\$1,607
2	145	\$567	145	\$563	184	\$739	213	\$1,231	215	\$1,661	256	\$2,160
3	145	\$582	182	\$598	213	\$941	215	\$1,578	254	\$2,130	284	\$2,769
5	182	\$620	184	\$645	215	\$1,234	254	\$2,024	256	\$2,732	286	\$3,551
7.5	184	\$968	213	\$943	254	\$1,565	256	\$2,574	286	\$3,475	324	\$4,517
10	213	\$1,132	215	\$1,147	256	\$2,036	284	\$3,053	324	\$4,122	326	\$5,358
15	215	\$1,555	254	\$1,569	284	\$2,599	286	\$4,012	326	\$5,417	364	\$7,042
20	254	\$1,882	256	\$2,012	286	\$3,168	324	\$4,748	364	\$6,410	365	\$8,333
25	256	\$2,461	284	\$2,435	324	\$3,479	326	\$5,624	365	\$7,593	404	\$9,870
30	284	\$2,901	286	\$2,892	326	\$3,992	364	\$6,234	404	\$8,416	405	\$10,941
40	286	\$3,171	324	\$3,178	364	\$6,365	365	\$7,722	405	\$10,425	444	\$13,552
50	324	\$3,567	326	\$3,725	365	\$7,157	404	\$9,200	444	\$12,420	445	\$16,146
60	326	\$4,916	364	\$5,123	404	\$8,477	405	\$10,667	445	\$14,401	445	\$18,721
75	364	\$6,475	365	\$6,065	405	\$9,640	444	\$12,831	445	\$17,322	447	\$22,519
100	365	\$7,150	404	\$7,228	444	\$11,301	445	\$18,095	447	\$24,429	449	\$31,757

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").

* "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3POM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Open Drip Proof (ODP)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FD, FR (CCP)

Close Coupled Pump Motors (JP, JM, JPY & JPZ) Energy Efficient

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 140-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction

- * 140-250: Aluminum End Shields
- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$467	143	\$439	143	\$589	143	\$679	—	—	—	—
0.33	143	\$467	143	\$439	143	\$589	143	\$679	—	—	—	—
0.5	143	\$467	143	\$439	143	\$589	143	\$679	—	—	—	—
0.75	143	\$467	143	\$439	143	\$589	145	\$679	—	—	—	—
1	143	\$467	143	\$439	145	\$589	182	\$679	—	—	—	—
1.5	143	\$467	145	\$461	182	\$594	184	\$824	—	—	—	—
2	145	\$510	145	\$507	184	\$665	213	\$1,108	—	—	—	—
3	145	\$524	182	\$539	213	\$846	215	\$1,420	—	—	—	—
5	182	\$558	184	\$580	215	\$1,111	254	\$1,821	—	—	—	—
7.5	184	\$871	213	\$848	254	\$1,409	256	\$2,317	—	—	—	—
10	213	\$1,019	215	\$1,033	256	\$1,832	284	\$2,748	—	—	—	—
15	215	\$1,400	254	\$1,412	284	\$2,339	286	\$3,611	—	—	—	—
20	254	\$1,694	256	\$1,811	286	\$2,851	324	\$4,511	—	—	—	—
25	256	\$2,215	284	\$2,192	324	\$3,305	326	\$5,343	—	—	—	—
30	284	\$2,611	286	\$2,603	326	\$3,792	364	\$5,922	—	—	—	—
40	286	\$2,854	324	\$3,019	364	\$6,046	365	\$7,336	—	—	—	—
50	324	\$3,389	326	\$3,538	365	\$6,799	404	\$8,740	—	—	—	—
60	326	\$4,670	364	\$4,867	404	\$8,053	405	\$10,134	—	—	—	—
75	364	\$6,151	365	\$5,762	405	\$9,158	444	\$12,190	—	—	—	—
100	365	\$6,793	404	\$6,867	444	\$10,736	445	\$17,190	—	—	—	—

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").

* "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

* For 720 or 600 RPM, Use Standard Efficiency or Premium Efficiency.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3POM



Three Phase Modifiable NEMA^{®†} Horizontal Motors Open Drip Proof (ODP)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



D, R (CCP)

Close Coupled Pump Motors (JP, JM, JPY & JPZ) Standard Efficient

- * Class F Insulation, Class B Rise At Service Factor On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * 140-320: Rolled Steel Frame Construction
- * 360-440: Cast Iron Frame Construction

- * 140-250: Aluminum End Shields
- * 280-440: Cast Iron End Shields
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$415	143	\$390	143	\$524	143	\$604	—	—	—	—
0.33	143	\$415	143	\$390	143	\$524	143	\$604	—	—	—	—
0.5	143	\$415	143	\$390	143	\$524	143	\$604	—	—	—	—
0.75	143	\$415	143	\$390	143	\$524	145	\$604	—	—	—	—
1	143	\$415	143	\$390	145	\$524	182	\$604	184	\$815	215	\$1,059
1.5	143	\$415	145	\$410	182	\$528	184	\$733	215	\$989	254	\$1,286
2	145	\$453	145	\$451	184	\$591	213	\$984	215	\$1,329	256	\$1,728
3	145	\$466	182	\$479	213	\$752	215	\$1,262	254	\$1,704	284	\$2,216
5	182	\$496	184	\$516	215	\$987	254	\$1,619	256	\$2,185	286	\$2,841
7.5	184	\$774	213	\$754	254	\$1,252	256	\$2,059	286	\$2,780	324	\$3,614
10	213	\$906	215	\$918	256	\$1,629	284	\$2,443	324	\$3,297	326	\$4,287
15	215	\$1,244	254	\$1,255	284	\$2,079	286	\$3,210	326	\$4,333	364	\$5,634
20	254	\$1,506	256	\$1,610	286	\$2,534	324	\$4,273	364	\$5,769	365	\$7,500
25	256	\$1,969	284	\$1,948	324	\$3,131	326	\$5,062	365	\$6,833	404	\$8,883
30	284	\$2,321	286	\$2,314	326	\$3,593	364	\$5,611	404	\$7,574	405	\$9,847
40	286	\$2,537	324	\$2,860	364	\$5,728	365	\$6,950	405	\$9,382	444	\$12,197
50	324	\$3,211	326	\$3,352	365	\$6,441	404	\$8,280	444	\$11,178	445	\$14,532
60	326	\$4,424	364	\$4,610	404	\$7,629	405	\$9,601	445	\$12,961	445	\$16,849
75	364	\$5,827	365	\$5,459	405	\$8,676	444	\$11,548	445	\$15,590	447	\$20,267
100	365	\$6,435	404	\$6,505	444	\$10,171	445	\$16,286	447	\$21,986	449	\$28,581

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").
* "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

DISCOUNT SYMBOL: DS-3POM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



UTE (CCP)

UNIMOUNT[®] Close Coupled Pump Motors (JP, JM, JPY & JPZ) Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts

- * Lifting Provisions On 180 Frame And Up
- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.33	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.5	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.75	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
1	143	\$529	143	\$518	145	\$704	182	\$1,282	213	\$1,731	215	\$2,250
1.5	143	\$584	145	\$565	182	\$904	184	\$1,401	213	\$1,892	254	\$2,459
2	145	\$622	145	\$611	184	\$996	213	\$1,544	215	\$2,084	256	\$2,709
3	182	\$886	182	\$795	213	\$1,216	215	\$1,885	254	\$2,545	—	—
5	184	\$1,088	184	\$908	215	\$1,707	254	\$2,646	256	\$3,572	—	—
7.5	213	\$1,345	213	\$1,228	254	\$2,260	256	\$3,502	—	—	—	—
10	215	\$1,556	215	\$1,458	256	\$2,683	—	—	—	—	—	—
15	254	\$2,239	254	\$2,131	—	—	—	—	—	—	—	—
20	256	\$2,730	256	\$2,463	—	—	—	—	—	—	—	—
25	284	\$3,595	284	\$3,237	—	—	—	—	—	—	—	—
30	—	—	286	\$3,666	—	—	—	—	—	—	—	—

* For Larger Ratings Not Shown, Refer To Hostile Duty.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



FUT (CCP)

UNIMOUNT[®] Close Coupled Pump Motors (JP, JM, JPY & JPZ) Energy Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts

- * Lifting Provisions On 180 Frame And Up
- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.33	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.5	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.75	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
1	143	\$476	143	\$466	145	\$634	182	\$1,154	—	—	—	—
1.5	143	\$526	145	\$509	182	\$814	184	\$1,261	—	—	—	—
2	145	\$560	145	\$550	184	\$896	213	\$1,389	—	—	—	—
3	182	\$797	182	\$716	213	\$1,095	215	\$1,697	—	—	—	—
5	184	\$979	184	\$817	215	\$1,536	254	\$2,381	—	—	—	—
7.5	213	\$1,211	213	\$1,105	254	\$2,034	256	\$3,152	—	—	—	—
10	215	\$1,400	215	\$1,312	256	\$2,414	—	—	—	—	—	—
15	254	\$2,015	254	\$1,918	—	—	—	—	—	—	—	—
20	256	\$2,457	256	\$2,217	—	—	—	—	—	—	—	—
25	284	\$3,236	284	\$2,913	—	—	—	—	—	—	—	—
30	—	—	286	\$3,299	—	—	—	—	—	—	—	—

* For 720 Or 600 RPM, Use Standard Efficiency Or Premium Efficiency.

* For Larger Ratings Not Shown, Refer To Hostile Duty.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



UT (CCP)

UNIMOUNT[®] Close Coupled Pump Motors (JP, JM, JPY & JPZ) Standard Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.25 Service Factor
- * 140: Rolled Steel Frame Construction
- * 180-280: Extruded Aluminum Frame Construction
- * Aluminum End Shields With Steel Bearing Inserts

- * Lifting Provisions On 180 Frame And Up
- * Removable Base On 180 Frame And Up
- * Regreasable Bearings Shaft End On 180 Frame And Up
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	56	\$423	56	\$414	56	\$564	145	\$1,026	—	—	—	—
0.33	56	\$423	56	\$414	56	\$564	145	\$1,026	—	—	—	—
0.5	56	\$423	56	\$414	56	\$564	145	\$1,026	—	—	—	—
0.75	56	\$423	56	\$414	143	\$564	145	\$1,026	—	—	—	—
1	143	\$423	143	\$414	145	\$564	182	\$1,026	213	\$1,385	215	\$1,800
1.5	143	\$467	145	\$452	182	\$723	184	\$1,121	213	\$1,513	254	\$1,967
2	145	\$498	145	\$489	184	\$797	213	\$1,235	215	\$1,667	256	\$2,167
3	182	\$709	182	\$636	213	\$973	215	\$1,508	254	\$2,036	—	—
5	184	\$870	184	\$726	215	\$1,366	254	\$2,117	256	\$2,858	—	—
7.5	213	\$1,076	213	\$982	254	\$1,808	256	\$2,802	—	—	—	—
10	215	\$1,245	215	\$1,166	256	\$2,146	—	—	—	—	—	—
15	254	\$1,791	254	\$1,705	—	—	—	—	—	—	—	—
20	256	\$2,184	256	\$1,970	—	—	—	—	—	—	—	—
25	284	\$2,876	284	\$2,590	—	—	—	—	—	—	—	—
30	286	\$2,994	286	\$2,933	—	—	—	—	—	—	—	—

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



Hostile Duty Close Coupled Pump Motors (JP, JM, JPY, JPZ) Premium Efficient - IE3

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * Cast Iron Frame Construction (140: Rolled Steel)
- * Cast Iron End Brackets
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware

- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2 Available With Adder
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.33	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.5	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
0.75	143	\$529	143	\$518	143	\$704	145	\$1,282	—	—	—	—
1	143	\$529	143	\$518	145	\$704	182	\$1,282	213	\$1,731	215	\$2,250
1.5	143	\$584	145	\$565	182	\$904	184	\$1,401	213	\$1,892	254	\$2,459
2	145	\$622	145	\$611	184	\$996	213	\$1,544	215	\$2,084	256	\$2,709
3	182	\$886	182	\$795	213	\$1,216	215	\$1,885	254	\$2,545	284	\$3,309
5	184	\$1,088	184	\$908	215	\$1,707	254	\$2,646	256	\$3,572	286	\$4,644
7.5	213	\$1,345	213	\$1,228	254	\$2,260	256	\$3,502	284	\$4,728	324	\$6,146
10	215	\$1,556	215	\$1,458	256	\$2,683	284	\$4,062	324	\$5,484	326	\$7,129
15	254	\$2,239	254	\$2,131	284	\$3,664	286	\$5,432	326	\$7,333	364	\$9,533
20	256	\$2,730	256	\$2,463	286	\$4,439	324	\$6,428	364	\$8,678	365	\$11,282
25	284	\$3,595	284	\$3,237	324	\$5,281	326	\$7,615	365	\$10,281	405	\$13,365
30	286	\$4,383	286	\$3,666	326	\$6,232	364	\$8,767	405	\$11,835	405	\$15,386
40	324	\$5,060	324	\$4,454	364	\$8,393	365	\$10,860	405	\$14,661	445	\$19,060
50	326	\$6,511	326	\$5,468	365	\$9,669	404	\$13,967	445	\$18,855	445	\$24,512
60	364	\$8,691	364	\$7,951	404	\$11,392	405	\$16,117	445	\$21,758	447	\$28,286
75	365	\$10,915	365	\$10,112	405	\$13,431	444	\$17,863	447	\$24,115	—	—
100	405	\$14,626	405	\$12,462	444	\$18,390	445	\$25,245	—	—	—	—

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").

** "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B - Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



Hostile Duty Close Coupled Pump Motors (JP, JM, JPY & JPZ) Energy Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * Cast Iron Frame Construction (140: Rolled Steel)
- * Cast Iron End Brackets
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware

- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2 Available With Adder
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.33	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.5	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
0.75	143	\$476	143	\$466	143	\$634	145	\$1,154	—	—	—	—
1	143	\$476	143	\$466	145	\$634	182	\$1,154	—	—	—	—
1.5	143	\$526	145	\$509	182	\$814	184	\$1,261	—	—	—	—
2	145	\$560	145	\$550	184	\$896	213	\$1,389	—	—	—	—
3	182	\$797	182	\$716	213	\$1,095	215	\$1,697	—	—	—	—
5	184	\$979	184	\$817	215	\$1,536	254	\$2,381	—	—	—	—
7.5	213	\$1,211	213	\$1,105	254	\$2,034	256	\$3,152	—	—	—	—
10	215	\$1,400	215	\$1,312	256	\$2,414	284	\$3,656	—	—	—	—
15	254	\$2,015	254	\$1,918	284	\$3,298	286	\$4,889	—	—	—	—
20	256	\$2,457	256	\$2,217	286	\$3,995	324	\$6,107	—	—	—	—
25	284	\$3,236	284	\$2,913	324	\$5,017	326	\$7,235	—	—	—	—
30	286	\$3,945	286	\$3,299	326	\$5,920	364	\$8,329	—	—	—	—
40	324	\$4,807	324	\$4,231	364	\$7,973	365	\$10,317	—	—	—	—
50	326	\$6,185	326	\$5,195	365	\$9,186	404	\$13,268	—	—	—	—
60	364	\$8,257	364	\$7,553	404	\$10,822	405	\$15,311	—	—	—	—
75	365	\$10,370	365	\$9,607	405	\$12,759	444	\$16,970	—	—	—	—
100	405	\$13,894	405	\$11,839	444	\$17,470	445	\$23,983	—	—	—	—

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").

* "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

* For 600 RPM, Use Standard Efficiency Or Premium Efficiency.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



Hostile Duty Close Coupled Pump Motors (JP, JM, JPY, JPZ) Standard Efficient

- * Class F Insulation, Class B Rise At Full Load On 60 Hertz Sine Wave Power
- * 1.15 Service Factor
- * Cast Iron Frame Construction (140: Rolled Steel)
- * Cast Iron End Brackets
- * Corrosion Resistant Mill And Chemical Duty Paint
- * Stainless Steel Nameplate And Zinc Plated Hardware

- * Shaft Slinger On Pulley End For IP54 Protection
- * Lifting Provisions On 180 Frame And Up
- * Regreasable Bearings On 250 Frame And Up
- * Self-Certified Division 2 Available With Adder
- * Non-Vent (TENV) Available With Adder
- * Air-Over (TEAO) Available With Deduct
- * Multi-Speed Available With Adder

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$423	143	\$414	143	\$564	145	\$1,026	—	—	—	—
0.33	143	\$423	143	\$414	143	\$564	145	\$1,026	—	—	—	—
0.5	143	\$423	143	\$414	143	\$564	145	\$1,026	—	—	—	—
0.75	143	\$423	143	\$414	143	\$564	145	\$1,026	—	—	—	—
1	143	\$423	143	\$414	145	\$564	182	\$1,026	213	\$1,385	215	\$1,800
1.5	143	\$467	145	\$452	182	\$723	184	\$1,121	213	\$1,513	254	\$1,967
2	145	\$498	145	\$489	184	\$797	213	\$1,235	215	\$1,667	256	\$2,167
3	182	\$709	182	\$636	213	\$973	215	\$1,508	254	\$2,036	284	\$2,647
5	184	\$870	184	\$726	215	\$1,366	254	\$2,117	256	\$2,858	286	\$3,715
7.5	213	\$1,076	213	\$982	254	\$1,808	256	\$2,802	284	\$3,782	324	\$5,532
10	215	\$1,245	215	\$1,166	256	\$2,146	284	\$3,250	324	\$4,936	326	\$6,416
15	254	\$1,791	254	\$1,705	284	\$2,931	286	\$4,345	326	\$6,600	364	\$8,580
20	256	\$2,184	256	\$1,970	286	\$3,551	324	\$5,786	364	\$7,811	365	\$10,154
25	284	\$2,876	284	\$2,590	324	\$4,753	326	\$6,854	365	\$9,253	405	\$12,028
30	286	\$3,506	286	\$2,933	326	\$5,608	364	\$7,890	405	\$10,652	405	\$13,847
40	324	\$4,554	324	\$4,009	364	\$7,554	365	\$9,774	405	\$13,195	445	\$17,154
50	326	\$5,860	326	\$4,921	365	\$8,702	404	\$12,570	445	\$16,970	445	\$22,060
60	364	\$7,822	364	\$7,156	404	\$10,252	405	\$14,505	445	\$19,582	447	\$25,457
75	365	\$9,824	365	\$9,101	405	\$12,088	444	\$16,077	447	\$21,704	—	—
100	405	\$13,163	405	\$11,216	444	\$16,551	445	\$22,721	—	—	—	—

* "JM" Shafts Are Defined Through 320 Frame (Larger Frames Are "TCZ").
* "JP" Shafts Are Defined Through 360 Frame (Larger Frames Are "TCZ").

DISCOUNT SYMBOL: DS-3PTM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



WEN

Washdown Duty, Premium Efficient - IE3

- * Internal Moistureproof Sealer
- * 303 Stainless Steel Shaft
- * USDA Approved Non-Toxic White Epoxy Paint
- * Class F Insulation
- * 1.15 Service Factor

- * Double Contact Sealed Ball Bearings
- * V-Ring Rotating Contact Shaft Seals
- * Smooth Design For Easy Cleaning
- * ONLY LIMITED MODIFICATIONS AVAILABLE
- * Only Limited Modifications Available

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$631	143	\$572	143	\$744	145	\$1,139	—	—	—	—
0.33	143	\$631	143	\$572	143	\$744	145	\$1,347	—	—	—	—
0.5	143	\$631	143	\$572	143	\$744	145	\$1,983	—	—	—	—
0.75	143	\$631	143	\$572	143	\$744	145	\$2,167	—	—	—	—
1	143	\$706	143	\$959	145	\$945	182	\$2,275	—	—	—	—
1.5	143	\$769	145	\$1,069	182	\$1,074	184	\$2,388	—	—	—	—
2	145	\$1,009	145	\$1,300	184	\$1,442	213	\$2,508	—	—	—	—
3	182	\$1,342	182	\$1,500	213	\$1,690	215	\$2,633	—	—	—	—
5	184	\$1,502	184	\$1,564	215	\$1,972	—	—	—	—	—	—
7.5	213	\$1,688	213	\$2,213	—	—	—	—	—	—	—	—
10	215	\$1,971	215	\$2,394	—	—	—	—	—	—	—	—

* Washdown Duty Available Through 215 Frame.

* For Larger Frames, Refer To "Washdown Features" In The Accessories/Modifications Section.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



Washdown Duty, Energy Efficient

* BISSC Certified (180-210 Frame)

* Internal Moistureproof Sealer

* 303 Stainless Steel Shaft

* USDA Approved Non-Toxic White Epoxy Paint

* Class F Insulation

* 1.15 Service Factor

* Double Contact Sealed Ball Bearings

* V-Ring Rotating Contact Shaft Seals

* Smooth Design For Easy Cleaning

* Only Limited Modifications Available

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
1	143	\$635	143	\$863	145	\$851	182	\$2,048	—	—	—	—
1.5	143	\$692	145	\$962	182	\$967	184	\$2,149	—	—	—	—
2	145	\$908	145	\$1,170	184	\$1,298	213	\$2,257	—	—	—	—
3	182	\$1,208	182	\$1,350	213	\$1,521	215	\$2,370	—	—	—	—
5	184	\$1,352	184	\$1,408	215	\$1,775	—	—	—	—	—	—
7.5	213	\$1,519	213	\$1,992	—	—	—	—	—	—	—	—
10	215	\$1,774	215	\$2,155	—	—	—	—	—	—	—	—

* Washdown Duty Available Through 215 Frame.

* For Larger Frames, Refer To "Washdown Features" In The Accessories/Modifications Section.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Fan Cooled (TEFC)

Cannot Be Used For Motors Covered by IHP Motor Final Rule 2016



Washdown Duty, Standard Efficient

* BISSC Certified (180-210 Frame)

* Internal Moistureproof Sealer

* 303 Stainless Steel Shaft

* USDA Approved Non-Toxic White Epoxy Paint

* Class F Insulation

* 1.15 Service Factor

* Double Contact Sealed Ball Bearings

* V-Ring Rotating Contact Shaft Seals

* Smooth Design For Easy Cleaning

* Only Limited Modifications Available

HP	RPM @ 60 Hertz											
	3600		1800		1200		900		720		600	
	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List	Frame	List
0.25	143	\$505	143	\$458	143	\$595	145	\$911	—	—	—	—
0.33	143	\$505	143	\$458	143	\$595	145	\$1,078	—	—	—	—
0.5	143	\$505	143	\$458	143	\$595	145	\$1,587	—	—	—	—
0.75	143	\$505	143	\$458	143	\$595	145	\$1,734	—	—	—	—
1	143	\$565	143	\$767	145	\$756	182	\$1,820	—	—	—	—
1.5	143	\$615	145	\$855	182	\$859	184	\$1,910	—	—	—	—
2	145	\$807	145	\$1,040	184	\$1,154	213	\$2,006	—	—	—	—
3	182	\$1,074	182	\$1,200	213	\$1,352	215	\$2,106	—	—	—	—
5	184	\$1,202	184	\$1,251	215	\$1,578	—	—	—	—	—	—
7.5	213	\$1,350	213	\$1,770	—	—	—	—	—	—	—	—
10	215	\$1,577	215	\$1,915	—	—	—	—	—	—	—	—

* Washdown Duty Available Through 215 Frame.

* For Larger Frames, Refer To "Washdown Features" In The Accessories/Modifications Section.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3FM

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



World Motor Cooling Tower Duty, Premium Efficient, 2 Speed, 1 Winding Utilize for Multi-Speed Only

- * Class F Insulation, 1.15 Service Factor, 40°C Ambient
- * Insulife-2000 Insulation Treatment
- * Cast Iron Frame (140: Rolled Steel) And End Brackets
- * Includes CORRO-DUTY[®] Motor Paint And Rotor Treatment
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Sealed Bracket To Frame Registers And Leads
- * Forsheda V-Ring Water Deflector
- * Lifting Provisions On 180 Frame And Up

- * Designed For Horizontal, Shaft Down And Shaft Up Mounting
- * Sealed Bracket-To-Frame Registers And Leads, Gasketed Conduit Box
- * Double Sealed, Same Size Bearings Both Ends
- * Dual Drilled Feet To Accommodate Mounting Flexibility
- * Bearing Caps On 180-440 Frame
- * Meets IEC 34-5 Classification IP55
- * Space Heater

HP	RPM @ 60 Hertz													
	3600		1800/900			1200/600			900		720		600	
	Frame	List	Frame	List A	List B	Frame	List A	List B	Frame	List	Frame	List	Frame	List
2	—	—	145	\$941	\$1,030	213	\$1,535	\$1,672	—	—	—	—	—	—
3	—	—	182	\$1,418	\$1,543	215	\$2,310	\$2,447	—	—	—	—	—	—
5	—	—	184	\$1,479	\$1,604	254	\$2,409	\$2,583	—	—	—	—	—	—
7.5	—	—	213	\$2,037	\$2,174	256	\$3,319	\$3,493	—	—	—	—	—	—
10	—	—	215	\$2,410	\$2,547	284	\$3,929	\$4,150	—	—	—	—	—	—
15	—	—	254	\$3,460	\$3,634	286	\$5,639	\$5,860	—	—	—	—	—	—
20	—	—	256	\$3,958	\$4,132	324	\$6,451	\$6,732	—	—	—	—	—	—
25	—	—	286	\$5,375	\$5,596	326	\$8,759	\$9,040	—	—	—	—	—	—
30	—	—	324	\$5,675	\$5,956	364	\$9,247	\$9,557	—	—	—	—	—	—
40	—	—	326	\$7,164	\$7,445	364	\$11,676	\$11,986	—	—	—	—	—	—
50	—	—	364	\$8,361	\$8,671	365	\$13,625	\$13,935	—	—	—	—	—	—
60	—	—	365	\$11,200	\$11,510	405	\$18,252	\$18,671	—	—	—	—	—	—
75	—	—	405	\$12,998	\$13,417	444	\$21,182	\$21,660	—	—	—	—	—	—
100	—	—	444	\$19,438	\$19,916	445	\$31,678	\$32,156	—	—	—	—	—	—

* 50 Hertz 661 PLUS[®] Motors Require Special Tagging. Make Adder For Special I.D. Nameplate.

* 720 & 600 RPM 841 PLUS[®] Motors Require Special Tagging. Make Adder For Special I.D. Nameplate.

* Designed To Meet The GM7E-TA Specification.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CTMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA® Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



World Motor Cooling Tower Duty, Premium Efficient, 2 Speed, 2 Winding Utilize for Multi-Speed Only

- * Class F Insulation, 1.15 Service Factor, 40°C Ambient
- * Insulife-2000 Insulation Treatment
- * Cast Iron Frame (140: Rolled Steel) And End Brackets
- * Includes CORRO-DUTY® Motor Paint And Rotor Treatment
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Sealed Bracket To Frame Registers
- * Forsheda V-Ring Water Deflector
- * Lifting Provisions On 180 Frame And Up

- * Designed For Horizontal, Shaft Down And Shaft Up Mounting
- * Gasketed Conduit Box
- * Double Sealed, Bearings Both Ends
- * Dual Drilled Feet To Accommodate Mounting Flexibility
- * Bearing Caps On 180-440 Frame
- * Meets IEC 34-5 Classification IP55
- * Space Heater

HP	RPM @ 60 Hertz													
	3600		1800/900			1200/600			900		720		600	
	Frame	List	Frame	List A	List B	Frame	List A	List B	Frame	List	Frame	List	Frame	List
2	—	—	184	\$1,535	\$1,660	215	\$2,127	\$2,264	—	—	—	—	—	—
3	—	—	213	\$2,310	\$2,447	254	\$3,202	\$3,376	—	—	—	—	—	—
5	—	—	215	\$2,409	\$2,546	256	\$3,341	\$3,515	—	—	—	—	—	—
7.5	—	—	254	\$3,319	\$3,493	284	\$4,601	\$4,822	—	—	—	—	—	—
10	—	—	256	\$3,929	\$4,103	286	\$5,447	\$5,668	—	—	—	—	—	—
15	—	—	284	\$5,639	\$5,860	324	\$7,818	\$8,099	—	—	—	—	—	—
20	—	—	286	\$6,451	\$6,672	326	\$8,944	\$9,225	—	—	—	—	—	—
25	—	—	324	\$8,759	\$9,040	364	\$12,143	\$12,453	—	—	—	—	—	—
30	—	—	326	\$9,247	\$9,528	365	\$12,820	\$13,130	—	—	—	—	—	—
40	—	—	364	\$11,676	\$11,986	404	\$16,186	\$16,186	—	—	—	—	—	—
50	—	—	365	\$13,625	\$13,935	405	\$18,889	\$19,308	—	—	—	—	—	—
60	—	—	405	\$18,252	\$18,671	444	\$25,304	\$25,782	—	—	—	—	—	—
75	—	—	405	\$21,182	\$21,601	445	\$29,367	\$29,845	—	—	—	—	—	—
100	—	—	445	\$31,678	\$32,156	447	\$43,917	\$44,395	—	—	—	—	—	—

* Use List B Pricing For W5,W8 Assembly Positions.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CTMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Air Over (TEAO)

World Motor Cooling Tower Duty, Premium Efficient, 2 Speed, 1 Winding Utilize for Multi-Speed Only

- * Class F Insulation, 1.15 Service Factor, 40°C Ambient
- * Insulife-2000 Insulation Treatment
- * Cast Iron Frame (140: Rolled Steel) And End Brackets
- * Includes CORRO-DUTY[®] Motor Paint And Rotor Treatment
- * Stainless Steel Nameplate And Zinc Plated Hardware
- * Sealed Bracket To Frame Registers And Leads
- * Forsheda V-Ring Water Deflector And/Or Inpro/Seal^{®†}
- * Lifting Provisions On 180 Frame And Up

- * Designed For Horizontal, Shaft Down And Shaft Up Mounting
- * Sealed Bracket-To-Frame Registers And Leads, Gasketed Conduit Box
- * Double Sealed, Same Size Bearings Both Ends
- * Dual Drilled Feet To Accommodate Mounting Flexibility
- * Bearing Caps On 180-440 Frame
- * Meets IEC 34-5 Classification IP55
- * Space Heater

HP	RPM @ 60 Hertz													
	3600		1800 / 900			1200 / 600			900		720		600	
	Frame	List	Frame	List A	List B	Frame	List A	List B	Frame	List	Frame	List	Frame	List
2	—	—	145	\$970	\$1,509	213	\$1,580	\$1,717	—	—	—	—	—	—
3	—	—	182	\$1,460	\$1,585	215	\$2,379	\$2,515	—	—	—	—	—	—
5	—	—	184	\$1,523	\$1,648	254	\$2,482	\$2,656	—	—	—	—	—	—
7.5	—	—	213	\$2,097	\$2,234	256	\$3,419	\$3,593	—	—	—	—	—	—
10	—	—	215	\$2,483	\$2,620	284	\$4,047	\$4,268	—	—	—	—	—	—
15	—	—	254	\$3,564	\$3,738	286	\$5,809	\$6,030	—	—	—	—	—	—
20	—	—	256	\$4,078	\$4,252	324	\$6,645	\$6,926	—	—	—	—	—	—
25	—	—	286	\$5,536	\$5,757	326	\$9,022	\$9,303	—	—	—	—	—	—
30	—	—	324	\$5,844	\$6,125	364	\$9,525	\$9,835	—	—	—	—	—	—
40	—	—	326	\$7,379	\$7,660	364	\$12,026	\$12,336	—	—	—	—	—	—
50	—	—	364	\$8,612	\$8,922	365	\$14,034	\$14,344	—	—	—	—	—	—
60	—	—	365	\$11,536	\$11,846	405	\$18,801	\$19,220	—	—	—	—	—	—
75	—	—	405	\$13,389	\$13,808	444	\$21,818	\$22,296	—	—	—	—	—	—
100	—	—	444	\$20,021	\$20,499	445	\$32,629	\$33,107	—	—	—	—	—	—

* Use List B Pricing For W5,W8 Assembly Positions.

* Air Velocity In Feet Per Minute Must Be Specified When Ordering TEAO Motors.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CTMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Totally Enclosed Fan Cooled (TEFC)



World Motor Cooling Tower Duty, Inverter Duty, Premium Efficient - IE3 (Single Speed Only) Variable Torque 10:1 (6-60 Hz) Speed Range

* Class F Insulation, 1.15 Service Factor, 40°C Ambient

* INVERTER GRADE[®] With Insulation That Exceeds The NEMA[®] MG-1 Part 31 Standard

* Insulife-2000 Insulation Treatment

* Cast Iron Frame (140: Rolled Steel) And End Brackets

* Includes CORRO-DUTY[®] Motor Paint And Rotor Treatment

* Stainless Steel Nameplate And Zinc Plated Hardware

* Sealed Bracket To Frame Registers

* Forsheda V-Ring Water Deflector

* Lifting Provisions On 180 Frame And Up

* Designed For Horizontal, Shaft Down And Shaft Up Mounting

* Gasketed Conduit Box

* Double Sealed, Bearings Both Ends

* Dual Drilled Feet To Accommodate Mounting Flexibility

* Bearing Caps On 180-440 Frame

* Meets IEC 34-5 Classification IP55

* Space Heater

* Shaft Grounding Ring Available With Adder

HP	RPM @ 60 Hertz														
	3600		1800			1200			900			720		600	
	Frame	List	Frame	List A	List B	Frame	List A	List B	Frame	List A	List B	Frame	List	Frame	List
2	—	—	145	\$698	\$787	184	\$1,290	\$1,415	213	\$1,930	\$2,065	—	—	—	—
3	—	—	182	\$1050	\$1175	213	\$1,942	\$2,079	215	\$3,070	\$3,285	—	—	—	—
5	—	—	184	\$1095	\$1220	215	\$2,026	\$2,163	254	\$3,192	\$3,415	—	—	—	—
7.5	—	—	213	\$1509	\$1646	254	\$2,791	\$2,965	256	\$4,265	\$4,564	—	—	—	—
10	—	—	215	\$1786	\$1923	256	\$3,304	\$3,478	284	\$4,855	\$5,195	—	—	—	—
15	—	—	254	\$2,563	\$2,737	284	\$4,742	\$4,963	286	\$7,185	\$7,688	—	—	—	—
20	—	—	256	\$2,932	\$3,106	286	\$5,425	\$5,646	—	—	—	—	—	—	—
25	—	—	284	\$3,981	\$4,202	324	\$7,365	\$7,646	—	—	—	—	—	—	—
30	—	—	286	\$4,203	\$4,424	326	\$7,776	\$8,057	—	—	—	—	—	—	—
40	—	—	324	\$5,307	\$5,588	364	\$9,818	\$10,128	—	—	—	—	—	—	—
50	—	—	326	\$6,193	\$6,474	365	\$11,457	\$11,767	—	—	—	—	—	—	—
60	—	—	364	\$8,297	\$8,607	404	\$15,349	\$15,768	—	—	—	—	—	—	—
75	—	—	365	\$9,628	\$9,938	405	\$17,813	\$18,232	—	—	—	—	—	—	—
100	—	—	405	\$14,399	\$14,818	444	\$26,639	\$27,117	—	—	—	—	—	—	—
125	—	—	444	\$18,713	\$19,191	445	\$33,086	\$33,564	—	—	—	—	—	—	—
150	—	—	445	\$22,537	\$23,015	447	\$37,835	\$38,313	—	—	—	—	—	—	—
200	—	—	447	\$29,166	\$29,644	449	\$49,881	\$50,359	—	—	—	—	—	—	—
250	—	—	449	\$37,534	\$38,012	—	—	—	—	—	—	—	—	—	—
300	—	—	449	\$43,363	\$43,841	—	—	—	—	—	—	—	—	—	—

* Use List B Pricing For W5,W8 Assembly Positions.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CTMW

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Totally Enclosed Air Over (TEAO)

World Motor Cooling Tower Duty, Inverter Duty, Premium Efficient - IE3 (Single Speed Only) Variable Torque 10:1 (6-60 Hz) Speed Range

* Class F Insulation, 1.15 Service Factor, 40°C Ambient

* INVERTER GRADE[®] With Insulation That Exceeds The NEMA^{®†}
MG-1 Part 31 Standard

* Insulife-2000 Insulation Treatment

* Cast Iron Frame (140: Rolled Steel) And End Brackets

* Includes CORRO-DUTY[®] Motor Paint And Rotor Treatment

* Stainless Steel Nameplate And Zinc Plated Hardware

* Sealed Bracket To Frame Registers And Leads

* Forsheda V-Ring Water Deflector And/Or Inpro/Seal^{®†}

* Lifting Provisions On 180 Frame And Up

* Designed For Horizontal, Shaft Down And Shaft Up Mounting

* Sealed Bracket-To-Frame Registers And Leads, Gasketed Conduit Box

* Double Sealed, Same Size Bearings Both Ends

* Dual Drilled Feet To Accommodate Mounting Flexibility

* Bearing Caps On 180-440 Frame

* Meets IEC 34-5 Classification IP55

* Space Heater

HP	RPM @ 60 Hertz														
	3600		1800			1200			900			720		600	
	Frame	List	Frame	List A	List B	Frame	List A	List B	Frame	List A	List B	Frame	List	Frame	List
2	—	—	145	\$719	\$808	184	\$1,329	\$1,454	213	\$1,930	\$2,027	—	—	—	—
3	—	—	182	\$1,081	\$1,206	213	\$2,001	\$2,138	215	\$3,070	\$3,224	—	—	—	—
5	—	—	184	\$1,129	\$1,254	215	\$2,087	\$2,224	254	\$3,192	\$3,415	—	—	—	—
7.5	—	—	213	\$1,554	\$1,691	254	\$2,875	\$3,049	256	\$4,265	\$4,478	—	—	—	—
10	—	—	215	\$1,839	\$1,976	256	\$3,403	\$3,577	284	\$4,855	\$5,098	—	—	—	—
15	—	—	254	\$2,640	\$2,814	284	\$4,884	\$5,105	286	\$7,185	\$7,544	—	—	—	—
20	—	—	256	\$3,021	\$3,195	286	\$5,588	\$5,809	—	—	—	—	—	—	—
25	—	—	284	\$4,101	\$4,322	324	\$7,586	\$7,867	—	—	—	—	—	—	—
30	—	—	286	\$4,330	\$4,551	326	\$8,009	\$8,290	—	—	—	—	—	—	—
40	—	—	324	\$5,466	\$5,747	364	\$10,112	\$10,422	—	—	—	—	—	—	—
50	—	—	326	\$6,380	\$6,661	365	\$11,801	\$12,111	—	—	—	—	—	—	—
60	—	—	364	\$8,545	\$8,855	404	\$15,810	\$16,229	—	—	—	—	—	—	—
75	—	—	365	\$9,917	\$10,227	405	\$18,347	\$18,766	—	—	—	—	—	—	—
100	—	—	405	\$14,831	\$15,250	444	\$27,438	\$27,916	—	—	—	—	—	—	—

* Use List B Pricing For W5,W8 Assembly Positions.

* Air Velocity In Feet Per Minute Must Be Specified When Ordering TEAO Motors.

* 60Hz 3600, 1800, 1200 & 900 RPM Motors Comply With U.S. D.O.E.'s Efficiency Regulation 10 CFR
Section 431 Subpart B – Electric Motors (See Appendix A2 & A3 For Nominal Efficiency Table)

DISCOUNT SYMBOL: DS-3CTMW

† All marks shown within this document are properties of their respective owners.



THREE PHASE MODIFIABLE NEMA^{®†} HORIZONTAL MOTORS

ACCESSORIES AND MODIFICATIONS

INTRODUCTION & PRICING GUIDELINES

Select the Base List Price from the previous section.

Price Adders for Accessories and Modifications that are not part of the standard product offering can be found in the following sections. Note that not all Accessories and Modifications are available on all product types or frame sizes. Refer to the detailed description for restrictions and guidelines of each Accessory and Modification.

All List Price Adders carry the same Discount Symbol as the Base List Price.

Percentage Adders are percent of the Base List Price, unless otherwise noted.

Some Accessories/Modifications will require a larger than standard Frame Size. All adders are to be made based on the confirmed Frame Size.

Round Total List Price to the nearest dollar.

Note that some adders are Net Adders.

Refer to office for product lead-times.

All prices are in U.S. Dollars.

Prices subject to change without notice.

Minimum Order Quantities

The following minimum order quantities apply to Modifiable NEMA^{®†} Horizontal Motors. Quantity is per rating.

56 / 140 Frames = Q-10

180 / 210 Frames = Q-5

250 Frame & Up = No Minimum

Orders with smaller quantities are available with a \$150 per order Set Up Charge (adder is divided across the order quantity).

Example: Q-4 140 Frame Motors

Set Up Charge = $\$150/4 = \37.50 Per Motor

This catalog covers Motors in Frame Sizes 56-447 (and some 449 Frame Ratings). For larger Motors, refer to the TITAN[®] Horizontal Motor Catalog (PB210).

For Vertical Motors, refer to the Vertical Motor Catalog (PB500).



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Altitude (3301 - 6000 Ft.)	57	57	89	118	157	210	276	354	512	726	1150	1960
Altitude (6001 Ft. And Up)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Aluminum Fan Adder	—	—	225	300	375	450	525	600	675	750	825	900
Arctic Duty	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Arctic Duty (with high tensile strength cast iron frame)	—	225%	225%	225%	225%	225%	225%	225%	225%	225%	225%	225%
Ambient (41 - 65°C)	57	57	89	118	157	210	276	354	512	726	1150	1960
Ambient (66 - 90°C)	114	114	178	236	314	450	552	708	1024	1452	2300	3920
Ambient (91°C And Up)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Assembly Position	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Assembly Position, "F0"	75	75	75	150	225	—	—	—	—	—	—	—
Balance, Special	192	192	192	192	221	221	251	251	317	317	606	606
Balance, Precision	384	384	384	384	441	441	501	501	633	765	1212	1212
Bases, Adjustable Motor Base	—	—	—	—	—	210	210	273	437	700	1315	1315
Bases, Slide Rails	—	—	—	—	—	—	345	443	885	1200	1440	1440
Bases, Dowel Pin Holes	—	—	—	—	—	188	188	188	188	188	188	188
Bases, Vertical Jacking Provisions	—	—	—	—	—	300	300	300	300	300	300	300
Bearings, Bearing Caps	—	—	225	225	300	300	375	375	375	—	—	—
Bearings, Double Sealed	150	150	150	150	180	216	260	389	583	612	645	675
Bearings, Roller	—	—	—	473	473	473	473	473	564	1073	1263	1263
Bearings, CARB ^{®†}	—	—	—	—	—	—	550	590	610	1150	1350	1350
Bearings, Insulated (Each)	—	300	375	750	1050	1350	1350	1350	1350	1350	1350	1350
Bearings, SKF ^{®†} Insocoat ^{®†} (Each)	—	—	—	—	—	—	1350	2050	2145	2242	2632	2632
Bearings, Locked Drive End Bearing	—	—	225	225	300	300	375	375	375	375	375	375
Bearings, Locked Opp. Drive End Bearing	—	—	225	225	300	300	375	375	375	375	375	375
Bearings, Same Size	—	225	225	225	300	300	375	375	450	525	525	525
Bearings, Spare Set	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Brake, Standard Enclosure												
1.5 Ft. Lb.	524	524	—	—	—	—	—	—	—	—	—	—
3 Ft. Lb.	557	557	—	—	—	—	—	—	—	—	—	—
6 Ft. Lb.	638	638	725	—	—	—	—	—	—	—	—	—
10 Ft. Lb.	788	788	860	1185	—	—	—	—	—	—	—	—
15 Ft. Lb.	916	916	1040	1249	1275	—	—	—	—	—	—	—
25 Ft. Lb.	—	—	1384	1472	1502	—	—	—	—	—	—	—
35 Ft. Lb.	—	—	1578	1678	1741	—	—	—	—	—	—	—
50 Ft. Lb.	—	—	1845	1969	2041	2150	—	—	—	—	—	—
75 Ft. Lb.	—	—	—	2722	2722	2832	—	—	—	—	—	—
105 Ft. Lb.	—	—	—	—	3674	3785	4041	—	—	—	—	—
125 Ft. Lb.	—	—	—	—	4206	4757	4757	5286	6195	—	—	—
175 Ft. Lb.	—	—	—	—	—	—	6732	7480	—	—	—	—
230 Ft. Lb.	—	—	—	—	—	—	7451	8279	—	—	—	—
330 Ft. Lb.	—	—	—	—	—	—	11503	—	10196	10196	10196	—
440 Ft. Lb.	—	—	—	—	—	—	—	—	11372	11372	11372	—
500 Ft. Lb.	—	—	—	—	—	—	—	—	18196	18196	18196	—

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Brake, Dust Tight/Waterproof Enclosure												
1.5 Ft. Lb.	780	780	—	—	—	—	—	—	—	—	—	—
3 Ft. Lb.	817	817	—	—	—	—	—	—	—	—	—	—
6 Ft. Lb.	898	898	916	—	—	—	—	—	—	—	—	—
10 Ft. Lb.	1064	1064	1064	1954	—	—	—	—	—	—	—	—
15 Ft. Lb.	1192	1192	1244	2018	2060	—	—	—	—	—	—	—
25 Ft. Lb.	—	—	2175	2175	2360	—	—	—	—	—	—	—
35 Ft. Lb.	—	—	2367	2367	2611	—	—	—	—	—	—	—
50 Ft. Lb.	—	—	2584	2584	2858	3153	—	—	—	—	—	—
75 Ft. Lb.	—	—	—	2584	3538	3824	—	—	—	—	—	—
105 Ft. Lb.	—	—	—	—	4490	4767	—	—	—	—	—	—
125 Ft. Lb.	—	—	—	—	—	4883	6195	6195	—	—	—	—
175 Ft. Lb.	—	—	—	—	—	—	8627	8627	—	—	—	—
230 Ft. Lb.	—	—	—	—	—	—	9347	9347	—	—	—	—
330 Ft. Lb.	—	—	—	—	—	—	11503	11503	11503	11503	11503	—
440 Ft. Lb.	—	—	—	—	—	—	—	—	12680	12680	12680	—
500 Ft. Lb.	—	—	—	—	—	—	—	—	20287	20287	20287	—
Brake, NEMA ^{®†} 4X Washdown Enclosure												
10 Ft. Lb.	—	1911	2281	2281	—	—	—	—	—	—	—	—
25 Ft. Lb.	—	—	2441	2441	2492	—	—	—	—	—	—	—
35 Ft. Lb.	—	—	2709	2880	2940	—	—	—	—	—	—	—
50 Ft. Lb.	—	—	3096	3292	3416	—	—	—	—	—	—	—
105 Ft. Lb.	—	—	—	—	5124	—	—	—	—	—	—	—
Brake, Hazardous Location, Class I & II, Grp D, F & G												
1.5 Ft. Lb.	2785	2785	—	—	—	—	—	—	—	—	—	—
3 Ft. Lb.	2929	2929	—	—	—	—	—	—	—	—	—	—
6 Ft. Lb.	3096	3096	—	—	—	—	—	—	—	—	—	—
10 Ft. Lb.	3341	3341	4682	4869	—	—	—	—	—	—	—	—
15 Ft. Lb.	3485	3485	5093	5093	5297	—	—	—	—	—	—	—
25 Ft. Lb.	—	—	4911	5220	5329	—	—	—	—	—	—	—
35 Ft. Lb.	—	—	5259	5592	5802	—	—	—	—	—	—	—
50 Ft. Lb.	—	—	6179	6570	6818	7358	—	—	—	—	—	—
75 Ft. Lb.	—	—	—	—	7494	7965	—	—	—	—	—	—
105 Ft. Lb.	—	—	—	—	9663	10039	—	—	—	—	—	—
Brakes, Brakeless Brake Motor	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)
Brakes, Breather Drain	345	345	345	345	345	345	345	345	345	345	345	—
Brakes, Release Options, Interlock Switch	750	750	750	750	750	750	750	750	750	750	750	—
Brakes, Release Options, Electric Release Indicator Switch	450	450	450	450	450	450	450	450	450	450	450	—
Brakes, S.S. Hardware	360	360	360	360	360	360	360	360	360	360	360	—
Brakes, Space Heaters	816	816	816	816	816	816	816	816	816	816	816	—
Brakes, Special Elbow Location	75	75	75	75	75	75	75	75	75	75	75	—
Brakes, Special Insulation	—	225	225	225	225	225	450	450	450	450	—	—
Brakes, Special Lead Length	—	105	105	105	105	105	105	105	105	105	—	—
Brakes, Special Paint	690	690	690	690	690	690	690	690	690	690	690	—

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Brakes, Splined Hub												
1.5-6 Ft. Lb.	525	525	525	525	525	525	525	525	525	525	525	—
10-35 Ft. Lb.	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	—
50-75 Ft. Lb.	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	—
105-330 Ft. Lb.	1403	1403	1403	1403	1403	1403	1403	1403	1403	1403	1403	—
Brakes, Tach Mounting Provisions	—	750	750	750	750	750	750	750	1500	1500	1500	—
Brakes, Thermostats	540	540	540	540	540	540	540	540	540	540	540	—
Brakes, Through Shaft	50	50	50	50	50	50	50	50	50	50	50	—
1.5-25 Ft. Lb.	75	75	75	75	75	75	75	75	75	75	75	—
35-105 Ft. Lb.	113	113	113	113	113	113	113	113	113	113	113	—
125-330 Ft. Lb.	225	225	225	225	225	225	225	225	225	225	225	—
Brakes, Vertical Mounted												
Above Motor	540	540	540	540	540	540	540	540	540	540	540	—
Below Motor	180	180	180	180	180	180	180	180	180	180	180	—
Brakes, Wear Indicator Switch	375	375	375	375	375	375	375	375	375	375	375	—
Brakes, Wire Brake Leads To Motor C/B	150	150	188	225	263	300	338	375	413	450	450	—
Conduit Box, Accessory	—	—	—	435	435	435	435	435	435	435	435	435
Conduit Box, Accessory with Terminal Board	—	—	—	870	870	870	870	870	870	870	870	870
Conduit Box, Condulet	—	—	375	375	375	375	375	375	375	375	375	375
Conduit Box, Cable Glands, Arrange To Accommodate	—	—	—	—	—	75	75	75	75	75	75	75
Conduit Box, Main Power Terminal Blocks	—	—	305	305	305	375	375	500	575	800	920	1050
Conduit Box, Cast Iron	—	143	150	180	195	218	225	323	323	593	593	593
Conduit Box, Oversized	—	90	90	90	90	90	90	165	165	450	450	450
Conduit Box, Drains/Breathers	—	128	128	128	128	128	128	128	128	128	128	128
Conduit Box, Lead Positioning Gasket	53	53	53	53	53	53	53	53	53	53	53	53
Conduit Box, Pipe Coupling Plate	—	75	75	75	75	75	75	75	75	75	75	75
Conduit Box, Remote Mounted	—	75	75	75	75	75	75	75	75	150	150	150
Conduit Box, Special Connector												
Meltrix 3 Lead Connector	—	—	600	600	600	600	600	900	900	900	900	900
Meltrix 6 Lead Connector	—	—	600	600	600	600	600	900	900	900	900	900
Conduit Box, Oversized, TITAN [®] Size												
Size 1.0 Cast Iron (Haz. Loc. only)	—	—	—	—	—	—	—	600	600	600	600	600
Size 1.5 Cast Iron (Haz. Loc. only)	—	—	—	—	—	—	—	—	1800	1800	1800	1800
Size 2.0 Cast Iron	—	—	—	—	—	—	—	900	900	900	900	900
Size 2.5 Cast Iron	—	—	—	—	—	—	—	—	1649	1649	1649	1649
Size 3.0 Cast Iron	—	—	—	—	—	—	—	—	—	2136	2136	2136
Size 4.5 Fabricated Steel	—	—	—	—	—	—	—	—	—	6480	6480	6480
Coupling, Mount Customer's Half Coupling	—	—	—	—	—	720	720	720	720	720	720	720
Crusher Duty	—	—	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Drains/Breathers (Price Each Bracket)												
Brass T-Type Breather/Drain	75	75	75	75	75	75	75	75	75	75	75	75
Plastic Plug/Drain	38	38	38	38	38	38	38	38	38	38	38	38
Stainless Steel T-Type Breather/Drain	113	113	113	113	113	113	113	113	113	113	113	113
Hazardous Location (UL ^{®†} Listed) Drain	188	188	188	188	188	188	188	188	188	188	188	188

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Drip Cover (Canopy Cap)	87	87	95	105	119	158	171	255	348	432	459	459
Efficiency Class	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Enclosure, ODP	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Enclosure, TEAO (DEDUCT)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Enclosure, TEFC	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Enclosure, TEFC, STEEL EDGE™ (Available on Price Pages 4 & 5)	—	—	-5%	-5%	—	—	—	—	—	—	—	—
Enclosure, TEFC, CORRO-DUTY® (If No CORRO-DUTY® List)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Enclosure, TEFC, Fan Cover, Cast Iron	—	95	104	159	248	300	314	567	918	1017	1017	1017
Enclosure, TENV	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Enclosure, Washdown Duty	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Enclosure, UL® Listed Division 1 & Division 2, Hazardous Location	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Enclosure, UL® Listed Div. 1&2 (Class I ONLY), 841 PLUS® Modifications	-	935	950	1420	1895	2370	3695	4250	4960	5725	6940	7245
Enclosure, Division 2, Nidec Motor Corp. Self-Certified (NEC 500)												
Class I, Grps. A,B,C&D, T1-T3	25	25	25	25	25	25	25	25	25	25	25	25
Class I, Grps. A,B,C&D, Class II, Grps. F&G, T3	25	25	25	25	25	25	25	25	25	25	25	25
Class I, Grps. A,B,C&D, Class II, Grps. F&G T3A (Eng. Approval Req'd)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Class I, Grps. A,B,C&D, Class II, Grps. F&G T3B (Eng. Approval Req'd)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Class I, Grps. A,B,C&D, Class II, Grps. F&G T3C (Eng. Approval Req'd)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Enclosure, Zone 2, Nidec Motor Corp. Self-Certified (NEC 505)												
Class I, Grps. IIA,IIB,&IIC, T1, T2 & T3	25	25	25	25	25	25	25	25	25	25	25	25
Enclosure, Division 2, CSA®†	-	-	-	-	-	-	-	-	-	-	-	-
Class I, T1-T3 (Engineering Approval Required)	25	25	25	25	25	25	25	25	25	25	25	25
Class I, T3A (Engineering Approval Required)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Class I, T3B (Engineering Approval Required)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Class I, T3C (Engineering Approval Required)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Enclosure, Zone 2, CSA®† (Motors Will Include Division Markings)												
Class I, Grps. IIA,IIB&IIC, T1, T2 & T3 (Requires Engineering Approval)	25	25	25	25	25	25	25	25	25	25	25	25
Encoders (* Check Availability Before Quoting)												
Arrange To Accom Size 20 Servo Mt (Nidec Motor Corp. Std)	900	900	900	900	900	900	900	900	900	900	900	900
Avtron®† AV32	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050
Avtron®† AV56A	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Avtron®† HS25A	900	900	900	900	900	900	900	900	900	900	900	900
Avtron®† HS35A	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Avtron®† HS45	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Avtron®† AV485	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200
Avtron®† AV685	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700
Avtron®† AV850	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800
Dynapar®† HS20	900	900	900	900	900	900	900	900	900	900	900	900
Dynapar®† HS35R	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Dynapar®† ST56	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800
Dynapar®† ST85	-	-	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Encoder Products Company®† 260	900	900	900	900	900	900	900	900	900	900	900	900
Encoder Products Company®† 25T	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Encoder Products Company®† 770	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Encoder Products Company®† 771	-	-	2550	2550	2550	2550	2550	2550	2550	2550	2550	2550
Encoder Products Company®† 775	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Encoder Products Company®† 776	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Hohner®† Series 14 (Intrinsically Safe)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Encoders, Ground Brush Option	750	750	750	750	750	750	750	750	750	750	750	750
Endshield, C-Face/D-Flange	101	101	149	149	201	320	459	665	992	1088	1145	1145

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Export Boxing (6% But Not Less Than \$75 NET)												
Export Box (Per Unit)	—	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Fire Pump Motor	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Foot Flatness, Special	—	—	75	75	75	225	225	225	450	450	450	450
Footless (Round Frame)	150	150	150	150	150	225	225	300	375	450	450	—
Frequency, 50 Hertz (ODP)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Frequency, 50 Hertz (TEFC, XP)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Grease Fittings (Special)	173	173	173	173	173	173	173	173	173	173	173	173
Grounding, Conduit Box, Lug or Servit Post	120	120	120	120	120	120	120	120	120	120	120	120
Grounding, Conduit Box, Terminal	53	53	53	53	53	53	53	53	53	53	53	53
Grounding, Frame (Double For Q-2)												
Ground Pad	—	—	—	—	—	—	—	—	—	225	225	225
Ground Terminal On Frame	98	98	98	98	147	147	147	206	206	206	206	206
Tapped Hole On Foot	98	98	98	98	147	147	147	206	206	206	206	206
Grounding, Shaft Grounding Rings												
Grounding, Shaft Grounding Ring Aegis ^{®†} SGR ^{®†}	—	325	325	350	365	378	420	450	525	575	575	575
Grounding, Shaft Grd. Ring Aegis ^{®†} SGR ^{®†} w/ Colloidal Silver Shaft Coating	—	525	525	550	715	843	885	950	1025	1115	1115	1115
Grounding, Shaft Grounding Ring Inpro/Seal ^{®†} CDR ^{®†}	—	325	325	350	365	378	420	450	525	575	575	575
Grounding, Shaft Grounding Ring Inpro/Seal ^{®†} CDR ^{®†} w/ Sleeve (No Terminal)	—	570	570	615	640	665	735	790	920	1010	1010	1010
Grounding, Shaft Seal Inpro/Seal ^{®†} MGS ^{®†}	—	675	780	840	885	930	1050	1095	1170	1395	1675	1675
Grounding, Inpro/Seal ^{®†} XP MGS ^{®†} (Hazardous Location Motor Ground Seal)	—	—	—	—	—	—	—	—	—	4950	5940	5940
Hardware, Stainless Steel	225	225	225	225	225	225	420	420	420	420	420	435
High Inertia Load	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Horsepower, Non-Standard	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Insulation, Class F	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD
Insulation, Class H	114	114	159	192	252	420	552	708	1023	1218	1686	1686
Insulation System, Insulife 1000	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD
Insulation System, Insulife 2000	50	50	65	102	131	218	278	342	461	597	780	780
Insulation System, VPI 1000	—	—	—	—	—	600	750	900	1050	1350	1575	1575
Insulation System, VPI 2000	—	—	—	—	—	750	957	1124	1584	1881	2321	2321
Insulation System, Abrasion Resistant Coating	51	51	51	81	104	173	221	272	365	474	474	474
Insulation System, Tropical Protection	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Inverter Duty (Automotive Duty)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Kiln Duty	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Leads, Longer Than Std (Q-1 to 5), Per Foot	113	113	113	113	113	113	113	113	113	113	113	113
Leads, Longer Than Std (Q-6+), Per Foot	68	68	68	68	68	68	68	68	68	68	68	68
Leads, Sealed (Potted)	413	413	413	413	443	450	549	609	620	780	800	800
Leads, Special Terminations												
Ring Type Lead Lugs	114	114	114	114	114	114	STD	STD	STD	STD	STD	STD
Two-Hole Lead Lugs	228	228	228	228	228	228	228	228	228	228	228	228
Lifting Provisions (Both Horiz. And Vert.)	—	—	90	90	128	128	173	173	218	240	240	240
Lubrication, High Temp Grease	150	150	150	150	150	250	320	390	525	685	890	890
Lubrication, Low Temp Grease	150	150	150	150	150	250	320	390	525	685	890	890
Lubrication, Washdown Duty Grease	75	75	75	75	75	125	160	195	265	340	445	445
Lubrication, Oil Mist	—	—	375	375	375	570	570	975	1650	1650	2025	—
Marine Duty	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Multi-Speed												
1 Winding, Constant HP	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%
1 Winding, Constant Torque	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
1 Winding, Variable Torque	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
2 Winding, Constant HP	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
2 Winding, Constant Torque	160%	160%	160%	160%	160%	160%	160%	160%	160%	160%	160%	160%
2 Winding, Variable Torque	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Nameplate, Additional Duplicate	53	53	53	53	53	53	53	53	53	53	53	53
Nameplate, Additional Stamping On Main N/P	53	53	53	53	53	53	75	75	75	75	75	75
Nameplate, Phase Sequence Plate	53	53	53	53	53	53	53	53	53	53	53	53
Nameplate, Rotation Arrow	53	53	53	53	53	53	53	53	53	53	53	53
Nameplate, Shipping Tag (#6 Paper Tag)	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Nameplate, Special I.D.	53	53	53	53	53	53	75	75	75	75	75	75
Nameplate, Starting Duty	53	53	53	53	53	53	53	53	53	53	53	53
Paint, CORRO-DUTY® Paint Job	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Paint, Special	150	150	225	300	375	450	525	600	675	750	750	750
Prints And Data (Submittals) (NET ADDERS)												
Standard Submittals (7)	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Current Pulsation Analysis	200	200	200	200	200	200	200	200	200	200	200	200
Complete Rotor And Shaft Detail Drawing	330	330	330	330	330	330	330	330	330	330	330	330
Customer Data Sheet	60	60	60	60	60	60	60	60	60	60	60	60
Sound Power In Watts	60	60	60	60	60	60	60	60	60	60	60	60
Sound Pressure In dB @ 3 Feet	30	30	30	30	30	30	30	30	30	30	30	30
Mass Elastic Data (Includes Shaft Stiffness)	170	170	170	170	170	170	170	170	170	170	170	170
Acceleration Time vs. Amps Curve	170	170	170	170	170	170	170	170	170	170	170	170
Performance Curve (Standard)	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Performance Curve (Non-Standard)	170	170	170	170	170	170	170	170	170	170	170	170
Equivalent Circuit Parameters	170	170	170	170	170	170	170	170	170	170	170	170
Sound Data vs. Center Band	60	60	60	60	60	60	60	60	60	60	60	60
Speed Vs. Torque & Amps Curve (Standard 100% Voltage)	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Speed Vs. Torque & Amps Curve (Non-Standard, Multiple Voltages)	60	60	60	60	60	60	60	60	60	60	60	60
Speed Vs. Torque & Amps Curve (Metric)	60	60	60	60	60	60	60	60	60	60	60	60
Safe Stall Time Curve	170	170	170	170	170	170	170	170	170	170	170	170
Reed Critical Frequency Data	30	30	30	30	30	30	30	30	30	30	30	30
Material Certificate For Shaft	220	220	220	220	220	220	220	220	220	220	220	220
Shaft Print	60	60	60	60	60	60	60	60	60	60	60	60
Special Oil & Gas Market Data Package	550	550	550	550	550	550	550	550	550	550	550	550
UL®† Certificate	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Purge Ports	375	375	375	375	375	570	570	975	1650	1650	2025	2025
Screens, Standard Material	—	—	—	—	—	255	308	375	555	578	578	578
Screens, Stainless Steel	—	—	—	—	—	275	378	549	828	864	864	864
Sealant, CORRO-DUTY® Rotor Assembly Treatment	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Sealant, Internal Sealer For Washdown	50	50	65	102	131	—	—	—	—	—	—	—
Sealant, RTV or Loctite®†	90	90	90	128	173	173	218	218	240	300	375	450

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[®] Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Seals (Price Each)												
Shaft Slinger	90	90	90	90	128	128	173	173	218	240	240	240
Inpro/Seal ^{®†}	225	225	225	225	375	525	525	675	675	825	990	990
Inpro/Seal ^{®†} with Cap Loc ^{®†}	504	504	567	689	819	941	1071	1193	1445	1697	1697	1697
Stainless Steel Inpro/Seal ^{®†}	—	563	563	563	938	1312	1312	1688	1688	2063	2475	2475
Inpro/Seal ^{®†} MGS (Motor Grounding Seal)	—	675	675	675	1125	1575	1575	2025	2025	2475	2970	2970
Inpro/Seal ^{®†} XP MGS ^{®†} (Hazardous Location Motor Ground Seal)	—	—	—	—	—	—	—	—	—	4950	4950	4950
Taconite Service Seals	225	225	225	225	375	525	525	675	675	825	990	990
Protech ^{®†} Seals	225	225	225	225	375	525	525	675	675	825	990	990
Lip Seals	90	90	90	128	128	128	173	173	218	218	240	240
Lip Seals With Umbrella Seals	115	115	115	165	165	165	225	225	285	285	315	315
Service Factor	57	57	80	96	126	210	276	354	512	726	1574	1574
Shaft, Close Coupled Pump (If No CCP List)	128	128	180	188	245	381	536	758	1104	1227	—	—
Shaft, Special (Base Adder) (Q-1 Motor)	438	438	438	525	567	638	690	813	953	1127	1197	1197
Shaft, Special (Base Adder) (Q-2 to 4 Motors)	200	200	206	210	219	254	288	327	384	464	498	498
Shaft, Special (Base Adder) (Q-5 or More)	53	53	62	75	87	123	153	188	227	279	279	279
Shaft, Special Material, 303 or 304 Stainless	110	110	110	245	345	516	939	1202	1748	1887	1983	1983
Shaft, Special Material, 316 or 416 Stainless	219	219	219	489	690	1032	1878	2403	3495	3774	3966	3966
Shaft, Special Material, Other	219	219	219	489	690	1032	1878	2403	3495	3774	3966	3966
Shaft, Special Shaft Runout	438	438	438	525	567	638	690	813	953	1127	1197	1197
Shaft, STD Double End Extension	54	54	54	87	105	156	246	333	393	480	507	507
Shaft, Tapped Hole	45	45	45	68	68	83	105	113	128	150	158	158
Shaft, Threaded Shaft	45	45	45	68	68	83	105	113	128	150	158	158
Shafts, Locknut On End	38	38	38	38	38	38	38	38	38	38	38	38
Shafts, Rust Preventative (Non-Standard)	38	38	38	38	38	38	38	38	38	38	38	38
Shafts, Tapered	60	60	75	90	105	135	150	165	195	210	210	210
Space Heater (Double For Haz. Location And Div. 2)	219	219	219	219	219	327	327	393	480	569	642	642
Space Heaters, Thermostat Controlled With Pilot Light	—	—	—	—	2441	2441	2441	2441	2441	2441	2441	2441
Starting Current, Lower Than Standard	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Starting Method	—	78	78	78	110	131	158	231	363	603	633	633
Temperature Rise, "B" Rise At 1.0 SF	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD
Temperature Rise, "B" Rise At 1.15 SF	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Temperature Rise, Class "A" Rise	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Temperature Rise, Less Than Class "A" Rise	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Tests												
Tests, Short Commercial, Un-Witnessed	200	200	200	200	200	200	200	200	200	200	200	200
Tests, Short Commercial, Witnessed	625	625	625	625	625	625	625	625	625	625	625	625
Tests, Complete Initial, Un-Witnessed (8)	1180	1180	1180	1180	1180	1180	1820	2360	2780	3860	3860	3860
Tests, Complete Initial, Witnessed (8)	1805	1805	1805	1805	1805	1805	2785	3540	4170	5790	5790	5790
Tests, Calibration Test, Un-Witnessed (8)	1442	1442	1442	1442	1442	1442	2082	2622	3042	4120	4120	4120
Tests, Calibration Test, Witnessed (8)	2070	2070	2070	2070	2070	2070	3050	3800	4435	6050	6050	6050
Tests, No Load Bearing Heat Run, Un-Witnessed	—	—	—	—	—	—	1690	1935	1935	1960	1960	1960
Tests, No Load IEEE-841 [™] Plus Un-Witnessed	—	900	900	900	900	900	900	900	900	900	900	900
Tests, No Load IEEE-841 [™] Plus Witnessed	—	1350	1350	1350	1350	1350	1800	1800	1800	2700	2700	2700
Tests, No Load Saturation, Un-Witnessed	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210
Tests, Polarization Index, Un-Witnessed	1135	1135	1135	1135	1135	1590	1590	1815	1815	1835	1835	1835
Tests, Polarization Index, Witnessed	1700	1700	1700	1700	1700	2380	2380	2720	2720	2755	2755	2755

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Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Tests, Rotor Integrity Test (Growler Test), Un-Witnessed	1170	1170	1170	1170	1170	1640	1640	1875	1875	1900	1900	1900
Tests, Shaft Voltage Test, Un-Witnessed	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025
Tests, Sound Test, Un-Witnessed (8)	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025
Tests, Sound Test, Witnessed (8)	1875	1875	1875	1875	1875	2625	2625	3000	3000	3040	3040	3040
Tests, Vibration, Un-Witnessed	700	700	700	700	700	700	700	700	700	700	700	700
Tests, Vibration, Witnessed	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
Tests, Std. Nidec Motor Corp. [®] Surge Test, Un-Witnessed	200	200	200	200	200	200	200	200	200	200	200	200
Tests, Std. Nidec Motor Corp. [®] Bearing Insulation Test, Un-Witnessed	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025
Thermal Protection, Bearings (Adder Each)												
Arrange to Accom BTD's	—	—	—	—	—	—	560	560	560	560	560	560
Thermocouples	—	—	—	—	—	—	370	370	370	370	370	370
RTD, 10 or 120 Ohm	—	—	—	—	—	—	845	845	845	845	845	845
RTD, 100 Ohm	—	—	—	—	—	—	1350	1350	1350	1350	1350	1350
RTD, 100 Ohm Precision	—	—	—	—	—	—	1830	1830	1830	1830	1830	1830
RTD, 100 Ohm Dual Element	—	—	—	—	—	—	2025	2025	2025	2025	2025	2025
RTD, 100 Ohm Precision Dual Element	—	—	—	—	—	—	2750	2750	2750	2750	2750	2750
Thermal Protection, Windings (Double For Hazardous Location And Division)												
Thermal Protection, Windings, Thermostats	80	80	80	95	95	120	170	255	255	255	255	255
Thermal Protection, Windings, Thermostats Hermetically Sealed	435	435	435	435	435	715	1020	1530	1530	1530	1530	1530
Thermal Protection, Windings, Thermistors	390	390	390	390	390	555	555	725	725	725	725	725
Thermal Protection, Windings, Therma-Sentry SMSE	—	—	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045
Thermal Protection, Windings, Therma-Sentry MMSE	—	—	—	—	—	—	—	1825	1825	1825	1825	1825
Thermal Protection, Windings, Thermocouples	—	—	—	2160	2160	2160	2160	2160	2160	2160	2160	2160
Thermal Protection, Windings, RTD's 10 or 120 Ohm	—	—	—	—	—	2160	2160	2160	2160	2160	2160	2160
Thermal Protection, Windings, RTD's (3/Phase) 10 or 120 Ohm	—	—	—	—	—	—	4320	4320	4320	4320	4320	4320
Thermal Protection, Windings, RTD's 100 Ohm	—	—	—	—	—	3245	3245	3245	3245	3245	3245	3245
Thermal Protection, Windings, RTD's (3/Phase) 100 Ohm	—	—	—	—	—	—	5190	5190	5190	5190	5190	5190
Thermal Protection, Windings, RTD's 100 Ohm Precision	—	—	—	—	—	4205	4205	4205	4205	4205	4205	4205
Torque, High	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Vibration Detector												
- Arrange-To-Accommodate Vibration Detectors	—	—	—	—	—	—	870	870	870	870	870	870
- BENTLY-NEVADA ^{®†} 330400 Accelerometer	—	—	—	—	—	—	—	—	—	4210	4210	4210
- BENTLY-NEVADA ^{®†} Velomitor (Prizo-Electric)	—	—	—	—	—	—	—	—	—	4275	4275	4275
- BENTLY-NEVADA ^{®†} 9200 Seismoprobe Transducer	—	—	—	—	—	—	—	—	—	5780	5780	5780
- METRIX [™] 5484E-121 Vibration Transmitter	—	—	—	—	—	—	—	—	—	3835	3835	3835
- METRIX [™] 5484E-123 Vibration Transmitter	—	—	—	—	—	—	3835	—	—	3835	3835	3835
- METRIX [™] 5491E-021 Vibration Transmitter	—	—	—	—	—	—	—	—	—	5174	5174	5174
- METRIX [™] 5550 Vibration Switch (Nidec Motor Corp. [®] Std. HAZ LOC)	—	—	—	—	—	—	—	—	4335	4335	4335	4335
- METRIX [™] 162VTS Vibration Transmitter	—	—	—	—	—	—	5100	5100	5100	5100	5100	5100
- ROBERTSHAW ^{®†} 365A8 Vibration Switch	—	—	—	—	—	—	4330	4330	4330	4330	4330	4330
- ROBERTSHAW ^{®†} 366A8 Vibration Switch (Nidec Motor Corp. [®] Std.)	—	—	—	—	—	—	2500	2500	2500	2500	2500	2500
- ROBERTSHAW ^{®†} 376A Vibration Switch	—	—	—	—	—	—	—	—	—	5435	5435	5435
- ROBERTSHAW ^{®†} 566 Vibration Switch	—	—	—	—	—	—	—	—	—	8235	8235	8235
Voltages, Special (<345 Volts)	39	39	39	87	120	144	347	510	798	1125	1463	1463
Voltages, Special (>345 Volts)	39	39	39	87	120	144	173	255	399	663	698	698

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

QUICK PICK CHART

Description	Frame Size											
	56	140	180	210	250	280	320	360	400	444-445	447	449
Warranty, Special (% ADDITION TO THE NET PRICE OF MOTOR)												
Deferred, 12 Months From Startup	5% NET ADDER											
Extended, 24 Months From Startup	2% NET ADDER											
Extended, 36 Months From Startup	3% NET ADDER											
Extended, 48 Months From Startup	5% NET ADDER											
Extended, 60 Months From Startup	6% NET ADDER											
Special, 12 Months From Startup	7% NET ADDER											
Special, 24 Months From Startup	14% NET ADDER											
Special, 36 Months From Startup	21% NET ADDER											
Special, 48 Months From Startup	28% NET ADDER											
Special, 60 Months From Startup	35% NET ADDER											
Washdown Features	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Zero Speed Switch	-	-	-	-	-	-	-	-	-	4425	4425	4425

- (1) For Altitudes higher than 6000 Feet, use Base List Price of next higher Horsepower of the same speed, PLUS adder for 3301-6000 Feet.
For Altitudes higher than 9900 Feet, Refer To Office.
 - (2) For Ambients above 90°C, use Base List Price of the next higher Horsepower at the same speed, PLUS adder for 66-90°C Ambient.
 - (3) Refer to the Base List Price Section for Pricing. Refer to the Accessories and Modifications Section for descriptions.
 - (4) For Non-Standard Horsepower ratings, price as the next higher standard horsepower rating of the same type and speed.
 - (5) For Tropical Protection, add for Insulife 2000 Insulation System and Screens (ODP Motors).
 - (6) For Washdown Features, start with CORRO-DUTY[®] and add for: Double Sealed Bearings, 303 Stainless Steel Shaft, White Epoxy Paint, Lip Seals-Both Ends, Washdown Duty Grease and Internal Sealant (56-250 Frame).
 - (7) Refer to the Accessories And Modifications Section for description.
 - (8) For Multi-Speed Motors, multiply the adder by 1.5.
- (N/C) No Charge if specified at time of Motor order



THREE PHASE MODIFIABLE NEMA^{®†} HORIZONTAL MOTORS

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THREE PHASE MODIFIABLE NEMA^{®†} HORIZONTAL MOTORS

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† All marks shown within this document are properties of their respective owners.

THREE PHASE MODIFIABLE NEMA^{®†} HORIZONTAL MOTORS

ACCESSORIES AND MODIFICATIONS

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† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

1. Altitude

Standard motors are designed for 3,300 feet altitude and 40°C ambient temperature. Atmospheric conditions at higher altitudes inhibit the motor's ability to dissipate heat, resulting in an increased temperature rise and a reduced motor capacity. NEMA standards state motor temperature will increase 1% for each 330-foot increment above the standard 3300-foot altitude design point. Ambient temperatures generally drop with an increase in altitude and are normally less than 40°C, even when installed indoors. Motors can be specifically designed for higher altitudes or derated, either due to lower ambient temperatures or by reducing output capacity.

A. 3,301 - 6,000 ft.

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	57	57	89	118	157	210	276	354	512	726	1150	1960

• To maintain motor service factor in altitudes of 3,301 to 6,000 feet (1,006 to 1,829 meters), make the altitude adder (percent of base list price) above for applications requiring higher altitude. Contact your Nidec Motor Corporation Technical Representative to confirm Frame Size.

B. 6,001 ft. and up

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

• To maintain motor service factor in altitudes higher than 6,001 feet (higher than 1,830 meters), make the altitude adder (percent of base list price) above for applications requiring higher altitude. Contact your Nidec Motor Corporation Technical Representative to confirm Frame Size.

• **DERATING FACTORS** -- Standard designs may be operated at the following altitudes due to reduced ambient temperatures. Does not apply to UL^{®†} Listed Hazardous Location motors. Nameplate will not acknowledge high-altitude use.

Altitude (ft.)	Derating Factor
3300-5000	0.97
5001-6600	0.94
6601-8300	0.91
8301-9900	0.88
9901-11500	0.85

• **ADJUSTMENT DUE TO REDUCED AMBIENT TEMPERATURE** -- Standard designs may be operated at the following altitudes due to reduced ambient temperatures. Does not apply to UL^{®†} Listed Hazardous Location motors. Nameplate will not acknowledge high-altitude use.

Maximum Altitude (ft.)	Ambient (°C)
3300	40°C
6600	30°C
9900	20°C

2. Aluminum Fan Adder

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	300	375	450	525	600	675	750	825	900

• Replace standard plastic fan with aluminum material fan. Contact your Nidec Motor Corporation Technical Representative for availability prior to quote.

3. Ambient

Standard designs described in this catalog are suitable for operation in ambient temperatures ranging from +40°C (104°F) to -30°C (-22°F). When standard designs are consistently exposed to ambient temperatures between -5°C (23°F) and -30°C (-22°F), special lubrication practices may be required. Additional precautions such as a space heater may be required depending on such factors as starting methods and duty cycle. Clearly state low ambient requirements on inquiries to your Nidec Motor Corporation Technical Representative and order documents if product will be consistently exposed to -50°C to -30°C ambients.

NOTE: The minimum ambient temperature for standard UL^{®†} Listed Hazardous Location motors is - 25°C See ARCTIC DUTY for ambient temperatures below - 25°C.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

3. Ambient (continued)

A. Arctic Duty - Low Ambient Application

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%

- Available option for TEFC motors applied in ambients of -30°C (-22°F) to -56°C (-70°F). Add 25% to the list price to provide any required special electrical, lubrication and Mechanical features (CORRO-DUTY[®] features are included). Price does not include space heater for motor winding. UL^{®†} Listed Hazardous Location motors require mandatory review by your Nidec Motor Corporation Technical Representative. When High Tensile Strength Cast Iron is requested or required by inquiry, add 225% to the base list price (Not Available on 56 Frame).

Product features include:

- Cast Iron Construction
- Stainless Steel Nameplate
- Corrosion Resistant Hardware
- Internal Moisture Protection
- 1.15 Service Factor
- Class F Insulation
- Special Lead Material
- Silicon Rubber Shaft Slinger
- Low Temperature Grease
- Special Conduit Box Gasket (Non-Hazardous Location only)
- Special Lead Potting Material (Hazardous Location only)

High Ambient Application

- To provide motors suitable for installation in ambient temperatures between 41°C and 65°C, make the list price addition shown below. Motor temperature rise will change from stated price book values with ambient temperatures above 40°C. Price book stated efficiency levels, frame sizes and lubrication specifications are also subject to change. For confirmed data, refer to your Nidec Motor Corporation Technical Representative. Ambient temperature ratings over 65°C are not available.

B. 41°C to 65°C

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	57	57	89	118	157	210	276	354	512	726	1150	1960

C. 66°C to 90°C

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	114	114	178	236	314	450	552	708	1024	1452	2300	3920

D. 91°C and up

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Motors with 1.15 SF may be derated to 1.0 SF for use in a 50°C ambient with no reduction in nameplate H.P. (Rated output). Non-Hazardous Location motors with 1.0 SF can be derated to accommodate ambient temperatures 40°C to 50°C by applying the following correction factors. Correction factors can be used, but actual performance will differ from published values.

AMBIENT TEMPERATURE	45°C	50°C
Rated Output reduced to	95 %	90 %

4. Assembly Position

A. Standard Assembly Positions

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

- The standard Assembly Position is considered "F1". "F2" Assembly Position is available at no charge when specified at time of Motor order.
- Floor Mounting: F1,F2
- Wall Mounting: W1,W2,W3,W4,W5,W6,W7,W8
- Ceiling Mount: C1,C2

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

4. Assembly Position *(continued)*

B. "F0" Assembly Position

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	75	75	75	150	225	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Assembly Position "F0" (Conduit Box on top with motor in horizontal position) is available as follows:

- ODP Motors in 140-320 Frames
- Hostile Duty Inverter Duty in 56-140 Frames
- UNIMOUNT[®] Inverter Duty is 56-140 Frames
- Rolled Steel TEFC (Type FS) in 140-210 Frames
- Washdown Duty in 180-210 Frames
- World Motor all constructions 56-449 frame

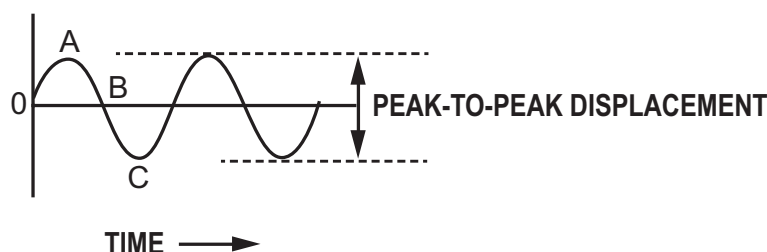
5. Balance

A. Special Balance

(Not Available With Roller Bearings)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	192	192	192	192	221	221	251	251	317	317	606	606

NEMA^{®†} standard MG1, Part 7, requires vibration readings to be measured in terms of velocity and stated as inches per second (IPS). Velocity is defined as the maximum speed at which displacement occurs. It takes into consideration both maximum displacement and time. To illustrate velocity, think of a point moving along a typical sine wave in a rising and falling fashion. As the point rises to its peak displacement (Point A), the velocity of movement is zero since it is about to change direction and must stop to do so. Changing direction, the point accelerates towards its peak displacement in the opposite direction (Point C). Midway between the peak displacement values (Point B), velocity is at its maximum. Since the velocity of motion is changing throughout its cycle, the highest peak is selected for measurement.



Nidec Motor Corporation balances all horizontal motors to meet the standard limits shown below. For special balance, make the list adder shown above.

VIBRATION LEVEL

Poles	Velocity (IPS-PEAK)	Velocity (IPS-PEAK)
	Standard	Special
2	0.15	0.08
4	0.15	0.08
6	0.15	0.08
8	0.12	0.06
10	0.12	0.06
12	0.12	0.06

B. Precision Balance

(Not Available With Roller Bearings)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	384	384	384	384	441	441	501	501	633	765	1212	1212

Precision Balance is 0.05 inches/second peak. (NEMA^{®†} Resilient Mount) All U.S. MOTORS[®] brand motors are dynamically balanced and the amplitude of vibration is measured on the bearing housing at no load per NEMA^{®†} MG1. Standard Balance is 0.15 inches/second peak for 2-6 pole, at 0.12 inches/second peak for 8 pole and slower (NEMA^{®†} Resilient Mount). Precision Balance is standard on 841 PLUS[®] motors.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

6. Bases

A. Adjustable Motor Base

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	210	210	273	437	700	1315	1315

Adjustable Motor Bases are kits, and are shipped loose for customer mounting. Available on 320 Frame and larger. Bases for 320-360 Frame have on adjusting screw; 400 Frame and up have two.

B. Slide Rails

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	345	443	885	1200	1440	1440

Slide Rails are kits, and are shipped loose for customer mounting. The kit includes quantity two rails and hardware. Available on 320 Frame and larger.

C. Dowel Pin Holes

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	188	188	188	188	188	188	188

Includes Dowel Pin Pilot Holes (pins supplied by others). Available on 280 Frame and larger.

D. Vertical Jacking Provisions

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	300	300	300	300	300	300	300

Used to assist installer in proper alignment of the motor shaft with the driven piece of equipment for shimming purposes. Will provide a tapped hole (one per foot), four per motor. A 3/8-16 UNC hole on 400-440 Frames. Customer will supply the bolts. Available on 280 Frame and larger. Not available on footless motors.

7. Bearings

A. Bearing Caps

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	225	300	300	375	375	N/C	N/C	N/C	N/C

Bearing Caps available on 180 Frame and larger. No charge on 400 Frame and larger. Bearing Caps are standard (no charge) on: CORRO-DUTY[®] Premium Efficiency motors, CORRO-DUTY[®] Inverter Duty motors, 841 PLUS[®] motors, and Hazardous Location motors.

B. Double Sealed Bearings

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	150	150	180	216	260	389	583	612	645	675

Double Sealed Bearings cannot be regreased. Standard (no charge) on Washdown Duty motors, and all 56-140 Frame motors. High or low temperature grease is available with increased lead time. Not available on Automotive Duty motors (violates the Auto Duty Spec).

C. Roller Bearing On Drive End

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	473	473	473	473	473	564	1073	1263	1263

Roller Bearings are only used on Belted or Chain Drive applications (not used on Direct Connected loads). Used for improved L-10 life on motors where High radial loads are present. Roller Bearings are available as open type only (no shields or seals). Belting Data for the application is required when specifying Roller Bearings. Available on 210 Frame and larger.

D. Carb^{®†} Bearing On Drive End

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	550	590	610	1150	1350	1350

CARB^{®†} bearings are only used on Belted or Chain Drive applications (not used on Direct Connected loads). Used for improved L-10 life on motors where high radial loads are present. These are only available as open type bearings. Available on 320 Frame and larger.

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

7. Bearings (continued)

E. Insulated, Ball Bearing (Adder Per End)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	300	375	750	1050	1350	1350	1350	1350	1350	1350	1350

Available on Inverter Duty motors. Double the adder for Insulated Bearings on both ends. Insulated Bearing on Short End is standard (no adder) on 400 Frame and larger Inverter Duty motors, therefore adder is \$0 for Insulated Bearing-Short End, and \$1350 for Insulated Bearing-Pulley End or Both Ends. Ceramic Bearings on 140-250 Frames.

F. SKF^{®†} Insocoat^{®†} Insulated Bearings (Adder Per End)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	1350	2050	2145	2242	2632	2632

Available on Inverter Duty motors. Double the adder for SKF Insocoat Insulated Bearings on both ends.

G. Locked Drive End Bearing

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	225	300	300	375	375	375	375	375	375

Locked Short End Bearing construction axially secures the bearing inner race on the shaft as well as clamping the outer bearing race. Available on 180 Frame and larger.

H. Locked Opposite Drive End Bearing

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	225	300	300	375	375	375	375	375	375

Locked Short End Bearing construction axially secures the bearing inner race on the shaft as well as clamping the outer bearing race. Available on 180 Frame and larger.

I. Same Size Bearings (Both Ends)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	225	225	225	300	300	375	375	450	525	525	525

Available on Non-Hazardous Location CORRO-DUTY[®] motors, 140 Frame and larger. On 440 Frame, available on "TS" Shaft motors only. Standard (no charge) on 841 PLUS[®] motors. Not available on motors with C-Face or D-Flange. Same size bearing is standard on TEFC Cast Iron 400 to 440 frame motors.

J. Spare Set, Ball/Roller Bearings

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Adder is percent of Base List Price. A Spare Set (quantity 2) of standard bearings supplied loose, shipped with the motor, when requested at the time of the motor order.

8. Brakes

A. Base Adder

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

Brake Details

Disc-Type, motor mounted brakes, either Dings^{®†} or Stearns^{®†}, will be supplied at Nidec Motor Corporation's option. Brakes are single phase spring set, electrically released with automatic reset in the following voltages:

• 60Hz: 115V, 200V, 208V, 230V, 460V, 575V • 50Hz: 110V, 200V, 220V, 380V, 440V, 500V, 550V

Standard Short-End Mounted Brakes are available, except as follows:

- Not Available on ODP 56-320 Frame
- Not Available on TEFC 360-400 Frame (see next bullet for alternate)
- Not Available on Washdown Duty Motors (except TENV)
- Not Available on Hazardous Location Motors above 286 Frame
- Not Available on 360 Frame Motors with D-Flange

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

8. Brakes *(continued)*

Can supply Brakes on 360-400 Frame TEFC Motors under the following conditions:

- Brake is mounted on the Pulley End of the Motor
- Must be Direct Connected Load (not belted or chain drive)
- The load is driven off of a Double-End Shaft Extension

Brake Enclosures

Standard Enclosure: for use on ODP & TEFC Motors for indoor or semi-protected outdoor installations. It is suitable for atmospheres containing chips, nonabrasive non-conductive non-explosive dusts, and coolants.

Marine/Navy Enclosure

Dust-Tight/Water-Proof Enclosure: should be selected for TEFC Motors in applications with extreme moisture, abrasive or conductive dusts, acid or alkali fumes, and for unprotected outdoor installations.

Hazardous Location Enclosure: should be chosen when the application calls for a Hazardous Location Motor. They should be selected based on NEC^{®†}/UL^{®†} listing requirements for a particular hazardous location potential for explosive reaction due to the presence of flammable liquids, explosive gases, volatile solids, or ignitable dusts in the atmosphere. U.S. MOTORS[®] brand basic offering includes Class I Group C&D, Class II Group F&G, T3C T-Code

NEMA^{®†} 4X Washdown Duty Enclosure: Limited offering available.

B. Breather Drain

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	345	345	345	345	345	345	345	345	345	345	345	N/A

C. Release Option, Interlock Switch

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	750	750	750	750	750	750	750	750	750	750	750	N/A

D. Stainless Steel Hardware

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	360	360	360	360	360	360	360	360	360	360	360	N/A

Standard (no charge) on NEMA^{®†} 4X Washdown Duty brakes.

E. Space Heaters (115V or 230V)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	816	816	816	816	816	816	816	816	816	816	816	N/A

F. Special Discs – Carrier Ring Disc

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	1500	1500	3000	3000	3000	N/A	N/A	N/A	N/A	N/A

G. Special Elbow Location

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	75	75	75	75	75	75	75	75	75	75	75	N/A

Available on Hazardous Location brakes only.

H. Special Insulation

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	225	225	225	225	225	450	450	450	450	N/A	N/A

I. Special Paint

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	690	690	690	690	690	690	690	690	690	690	690	N/A

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

8. Brakes (continued)

J. Splined Hub

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

K. Thermostats

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	540	540	540	540	540	540	540	540	540	540	540	N/A

Standard on Hazardous Location brakes.

L. Through Shaft

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing. Not available on Hazardous Location brakes.

M. Vertical Mounted

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

9. Conduit Box

A. Accessory Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	435	435	435	435	435	435	435	435	435

Adder is per Accessory Box provided. Available on motors with Cast Iron Frames, 210 Frame and larger. Accessory Conduit Boxes are included as standard (no charge) when Thermistors, Thermocouples or Winding RTDs are provided.

B. Accessory Conduit Box with Terminal Board

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	870	870	870	870	870	870	870	870	870

Adder is per Accessory Box provided. Available on motors with Cast Iron Frames, 320 Frame and larger. Accessory Conduit Box with Terminal Board is included as standard (no charge) when Winding RTDs are provided.

C. Condulet

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	375	375	375	375	375	375	375	375	375	375

Adder is per Condulet provided.

D. Cable Glands, Arrange-To-Accommodate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	75	75	75	75	75	75	75

E. Terminal Blocks for Main Power Leads

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	305	305	305	375	375	500	575	800	920	1050

Stud-Type Terminal Blocks for Main Power Leads are available on the following products listed below when supplied with up to 9 Leads ONLY. Standard lead connection shall be supplied. If special lead connection is required, please contact Nidec Motor Corporation for availability prior to quoting.

- CORRO-DUTY[®] motors
- Hostile Duty motors
- Unimount[®] motors
- Open Drip Proof motors
- Premium Efficient Automotive Duty (JDE)
- 841 PLUS[®] motors

† All marks shown within this document are properties of their respective owners.

Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

9. Conduit Box *(continued)*

F. Cast Iron Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	143	150	180	195	218	225	323	323	593	593	593

Cast Iron Conduit Box is available on the following products:

- CORRO-DUTY[®] motors (standard – N/C)
- Hostile Duty motors
- Premium Efficient Automotive Duty (JDE)
- Hazardous Location motors (standard – N/C)
- Open Drip Proof motors 360 Frame and larger

G. Conduit Box, Oversized

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	90	90	90	90	90	90	165	165	450	450	450

Main Conduit Boxes are supplied of Cast Iron, Cast Aluminum or Steel in adequate size to protect motor leads and meet or exceed NEMA^{®†} minimum requirements. All boxes must meet NEMA^{®†} Type 4 Water Resistance. Oversized Conduit Boxes come in two standard offerings:

- One size larger than U.S. MOTORS[®] brand standard (not available on 140 Frame Hazardous Location motors)
- One size larger than NEMA^{®†} standard

H. Drains/Breathers

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	90	90	90	90	90	90	165	165	450	450	450

The following options are available for Drains/Breathers in the Main Conduit Box or Accessory Conduit Box:

- 1/8" NPT Drain Hole in Conduit Box (Not available on Hazardous Location)
- 1/2" Drain Hole in Conduit Box (Not available on Hazardous Location)
- Breather/Drain in Conduit Box Adder is per Conduit Box. Refer to the "Conduit Box, Accessory" option for availability of Accessory Conduit Boxes.

I. Lead Positioning Gasket

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	53	53	53	53	53	53	53	53	53	53	53

Standard (no charge) on CORRO-DUTY[®] motors. Conduit Box Gaskets are not available on Hazardous Location motors, per UL^{®†} restrictions.

J. Pipe Coupling Plate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	75	75	75	75	75	75	75	75	75	75	75

Replaces Main Conduit Box with a steel plate which has a NEMA^{®†} standard pipe threaded hole for the connection of a conduit. Not available on Hazardous Location motors. Not available on ODP motors, 56-210 Frame. Not available on UNIMOUNT[®] motors. Lead positioning gasket not available with Pipe Coupling Plate.

K. Remote Mounted

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	75	75	75	75	75	75	75	75	150	150	150

For locations where the Conduit Box is not mounted directly on the motor. Includes a Pipe Coupling Plate mounted on the motor and the Conduit Box shipped loose. Not available on Hazardous Location motors. Not available on ODP motors, 56-320 Frame. These applications normally require extra long leads (refer to the "Leads, Longer than Standard" option).

L. Special Connector

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing.

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Accessories and Modifications

9. Conduit Box (continued)

M. Oversized, TITAN® Size

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. TITAN® size Conduit Boxes are available on 400-440 Frames as follows:

- Size 1.0 Cast Iron (900 cu. in.) - also fits 360 Frame
- Size 1.5 Cast Iron (3200 cu. in.) - Hazardous Location only
- Size 2.0 Cast Iron (1300 cu. in.)
- Size 2.5 Cast Iron (2000 cu. in.) - 440 Frame only
- Size 3.0 Cast Iron (3400 cu. in.) - 440 Frame only
- Size 4.5 Fabricated Steel (16,200 cu. in.) - 440 Frame only

10. Coupling, Mount Customer's Half Coupling

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	720	720	720	720	720	720	720

Nidec Motor Corporation will mount customer supplied, finished bored, key-seated and balanced half coupling on 280 frame and larger. Coupling half must be finished machined to motor shaft dimensions and sent prepaid with installation instructions to the factory prior to start of manufacture. Motors will be dynamically balanced during production and will not be rebalanced after installing half coupling.

11. Crusher Duty (TEFC Only)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. Available on Cast Iron Frame Enclosed motors, 180 Frame and larger. Crusher Duty includes a special rotor design, increased locked rotor and breakdown torque, turn bracing and lock washers. Requires a review of load inertia and load curve for application.

12. Drains/Breathers (Price Each Bracket)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. Standard construction on Non-Hazardous Location motors includes drain holes in the bottom of the motor. The hole is provided at the lowest point of the motor, and serves as both a drain and a breather. In addition to Drain Holes, the following Drains/Breathers options are available:

- Brass T-Type Drains/Breathers (standard on 841 PLUS® motors)
- Stainless Steel T-Type Drains/Breathers
- Plastic Plug/Drains (standard on CORRO-DUTY® motors)
- Hazardous Duty (UL®† Listed) Drains (standard on CORRO-DUTY® Hazardous Location motors)

If Drains/Breathers are selected for Hazardous Location motors, must select Hazardous Location Drains/Breathers.

Drains/Breathers not available on the following:

- Brass or Stainless Steel not available on UNIMOUNT® or Washdown Duty motors
- Drains/Breathers not available on Open Drip Proof (ODP) motors.

13. Drip Cover (Canopy Cap)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	87	87	95	105	119	158	171	255	348	432	459	459

Provides protection to the motor in a Vertical Shaft Down position. Not available on Non-Vent (TENV) or Air-Over (TEAO) motors.

14. Efficiency Class

The Energy Independence and Security Act of 2007 (EISA) took effect on December 19, 2010, changing mandatory efficiency levels for 3-phase electric motors up to 600 volts, which are manufactured or imported into the USA. Under the EISA regulation, electric motors previously required to meet EPA efficiency levels must move up to NEMA Premium standards. These include general purpose motors from 1 to 200 horsepower. In addition, products not previously covered by EPA are required to meet EPA levels. These include U-frame, design C, close coupled pump, footless, vertical solid shaft normal thrust, 8-pole motors, and 201 to 400 horsepower design B motors.

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

14. Efficiency Class *(continued)*

(3) Refer to the Base List Price section for pricing. Nidec Motor Corporation supplies motors in three Efficiency Classes:

- NEMA Premium^{®†}: NEMA Premium^{®†} is an efficiency level approved by NEMA^{®†}, CEE, utilities and some government standards as an agreed-upon value for premium levels.
- Energy Efficient: Fully complies with EPAct '92 and NRCAN Efficiencies. Cannot Be Used For Motors Covered by EISA-2007 / IHP HP Motor Final Rule 2016.
- Standard Efficiency: Standard Efficient motors can only be used in situations not covered by EISA-2007 or NRCAN. Cannot Be Used For Motors Covered by EISA-2007 / IHP HP Motor Final Rule 2016.

15. Enclosures

A. Open Drip Proof (ODP)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

(3) See Base List Price section for pricing. Open Drip Proof (ODP): A machine in which the ventilating openings are so constructed that successful operation is not interfered with when drops of liquid or solid particles strike or enter the enclosure at any angle from 0 to 15 degrees downward from the vertical (NEMA^{®†} NG-1). These are motors with ventilating openings which permit passage of external cooling air over and around the windings.

B. Totally Enclosed, Air Over (TEAO) (DEDUCT)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Note: This is a price DEDUCT, instead of an adder. Deduct is percent of the TEFC Base List price. Totally Enclosed Air Over (TEAO): The TEAO enclosure does not utilize a fan for cooling, but is used in situations where air is being blown over the motor frame for cooling, such as in a fan application. Air velocity in feet per minute must be specified when ordering TEAO motors. For a remote mounted conduit box, refer to the "Conduit Box, Remote Mounted" option.

C. Totally Enclosed, Fan Cooled (TEFC)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

(3) See Base List Price section for pricing. Totally Enclosed, Fan Cooled (TEFC): The TEFC enclosures do not allow a free exchange of air to take place between the external environment and internal motor components. Heat generated by the motor is dissipated when the external fan forces cool air over the surface of the frame and end brackets. TEFC motors are widely applied to dust laden, abrasive and corrosive environments where maximum internal component protection is required. Since there is no free exchange of air, TEFC motors can be susceptible to internal condensation. Areas of high humidity or where great swings in day to night temperatures frequently occur can experience internal condensation. Additionally, TEFC motors applied to intermittent-duty loads can be prone to condensation as the heating (run time) and cooling (down time) cycles tend to draw moisture into the motor as it cools down and remains idle.

D. Totally Enclosed, Fan Cooled, (TEFC), STEEL EDGE[™] (Available on Price Pages 4 & 5)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	-5%	-5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Deduct is percent of Base List Price. Totally Enclosed, Fan Cooled (TEFC), STEEL EDGE[™]: Rolled Steel frame construction. Available in 182-215 Frame sizes.

TEFC Enclosure Options

CORRO-DUTY[®] Motor Construction (If no CORRO-DUTY[®] List)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Adder is percent of Base List Price. Use this adder only if there is no CORRO-DUTY[®] Base List Price. Refer to Base List Price section. CORRO-DUTY[®] option is available on Totally Enclosed motors only. CORRO-DUTY[®] Motor Construction includes these features:

- Cast Iron construction: Frame, Endshields, Conduit Box and Fan Cover (Rolled Steel Frame on 140)
- Insulife 2000 Insulation Treatment



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

15. Enclosures (continued)

- Class F Insulation
- Corrosion Resistant Mill and Chemical Duty Paint
- Shaft Slinger on Pulley End for IP54 Protection
- Ground Lug in Conduit Box
- Corrosion Resistant Zinc Plated Hardware
- 1.15 Service Factor
- Drains/Breathers
- Lead Positioning Gasket
- Stainless Steel Nameplate

Cast Iron Fan Cover Guard

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	95	104	159	248	300	314	567	918	1017	1017	1017

Available on TEFC motors with cast iron frames, 140 Frame and larger. Standard (no charge) on CORRO-DUTY[®] models.

E. Totally Enclosed, Non-Ventilated (TENV)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%

Adder is percent of Base List Price. Totally Enclosed, Non-Ventilated (TENV): A TENV type enclosure does not have a fan. CAUTION: in most cases, an oversized frame is required. Confirm the frame size before quoting.

F. Washdown Duty

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

(3) See Base List Price section for pricing. Washdown Duty: An enclosure designed for use in the food processing industry and other applications that are routinely exposed to washdown, chemicals, humidity and other severe environments. Available in 56-215 Frame sizes. For motors with Washdown Duty features in frame sizes larger than 215, refer to the "Washdown Features" option. Not available on 210 Frame, 2 Pole motors.

G. Hazardous Location, (UL^{®†} Listed) Division 1 and Division 2

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

(3) See Base List Price section for pricing. Hazardous Location: A Totally Enclosed motor whose enclosure is designed and constructed to withstand an explosion of a specified gas or vapor which may occur within it and to prevent the ignition of the specified gas or vapor surrounding the motor by sparks, flashes or explosion of the specified gas or vapor which may occur within the machine casing (NEMA^{®†} MG-1). Orders for Hazardous Location motors must specify Division, Class, Group and Temperature Code. Refer to page A4 for definitions of Division, Class, Group and T-codes. The following restrictions apply to NEMA^{®†} Frame Horizontal Motors:

- Group C not available on 210 Frame and smaller
- Group C not available on 440 Frame
- Group E not available on NEMA^{®†} Frame sizes
- Dual Label with Service Factor usually requires an oversized frame (may exceed that "Max HP * SF" values). Confirm the Frame Size before quoting.
- Terminal Strip not available.

H. 841 PLUS[®] Modifications (Available on UL^{®†} Listed Division 1 or 2 Class I Motors Only)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	935	950	1420	1895	2370	3695	4250	4960	5725	6940	7245

- Start with Premium Efficiency Hazardous Location UL^{®†} Listed Division 1 or Division 2 Base List Price. Available on Class I motor ONLY.
- 841 PLUS[®] Modifications includes the following:

- Corro-Duty[®]
- Special Foot Flatness
- Inpro/Seal[®] on Both Ends for IP55 Bearing Protection
- Special Shaft Runout
- Special Balance
- Cast Iron Fan Cover
- Non-Witnessed IEEE 841 Enhanced No Load Test

I. Division 2 Self Certified (Non-Listed) and CSA^{®†} Certified Division 2

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)



Three Phase Modifiable NEMA®† Horizontal Motors

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15. Enclosures (continued)

Refer to Quick Pick Chart for pricing. Percentage adders are percent of the total list price (Base Price + All Adders). The following restrictions apply:

- Not available (not applicable) on UL® Listed Hazardous Location motors
- Must use Energy or Premium Efficiency
- Temperature codes T-4 through T-6 not available
- Available on Inverter Duty motors with temperature codes T1-T3 only
- Class II not available on Open Drip Proof (ODP) motors
- Group E not available

Use the Hazardous Location adders for all accessories. Temperature codes other than T1-T3 may result in an oversized frame. Confirm frame size prior to quoting. When Thermostats are requested, hermetically sealed thermostats are required. Zone 2 labeled motors will also be Division 2 labeled. T-code lower than T3 and/or CSA Division 2 require Nidec Motor Corporation Engineering approval prior to quote.

J. Weather Protected I (WPI)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	578	578	578

Available on Open Drip Proof (ODP) motors. Available on 440 frame.

16. Encoders

A. (QP) Refer to Quick Pick Chart for Pricing & Available Options

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Encoders are not available on Hazardous Location motors.

B. Ground Brush Option

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	750	750	750	750	750	750	750	750	750	750	750	750

Ground Brush Option is in addition to the Encoder adder. The Encoder Ground Brush option is only available with the following encoders:

- Avtron® M/N AV285, AV485 or AV685

17. Endshields, C-Face/D-Flange

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	101	101	149	149	201	320	459	665	992	1088	1145	1145

Adder is for C-Face or D-Flange with feet. For footless motors, also use the "Footless" adder. Double adder for flanges on both ends.

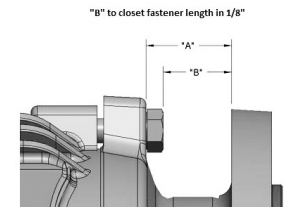
C-Face and D-Flange on Pulley End (Drive End) is available except as follows:

- D-Flange not available on Open Drip Proof (ODP) motors in 56-280 Frames
- C-Face and D-Flange not available on 449 Frame Hazardous Location motors.

C-Face is available on Short End (Opposite Drive End) except as follows:

- Not available on TEFC motors in 360 or 400 Frames
- Not available on Hazardous Location motors in 320-440 Frames
- Not available on ODP motors in 56-250 Frames
- Not available on Washdown Duty motors

Frame	"A"	"B"	Fastener
210	1.79	1.500	5/16
250	1.78	1.500	3/8
280	1.69	1.375	1/2
320	1.77	1.375	1/2
360	2.12	1.75	1/2
400	1.65	1.125	5/8
440	1.63	1.125	5/8



World Motor D-flange: Depending on mounting configuration, a stud and nut may be required.

18. Export Boxing (6% List Adder)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%

Refer to Quick Pick Chart for pricing. Adder is percent of Base List Price. Minimum charge per unit is \$75 NET. Export packaging is available from our International warehouse in Southaven, MS.

19. UL®† Listed Fire Pump

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Adder is percent of Base List Price. U.S. MOTORS® brand UL®† listed (File EX5189) Fire Pump motors are designer per UL®†-1004A (currently UL-1004-5) and meet the NFPA®†-20 "Standard for the Installation of Centrifugal Fire Pump Specification." U.S. MOTORS® brand UL®† listed Fire Pump motors meet the special design requirements listed below:

- Designed to meet NEMA®† Design "B" limitations per NEMA®† MG1-2011
- Calculated Safe Stall Time must exceed 12 seconds (cold)
- Applies to motors rated 500 HP or less, and 600 volts or less
- Motors designated for Canada must meet CSA-390 Table 2 efficiency values

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

19. UL^{®†} Listed Fire Pump *(continued)*

- Suitable for the following starting methods:
 - Across-the-Line Start (All Frame Sizes)
 - Also suitable for Wye-Start/Delta-Run (250 Frame and larger)
 - Dual Voltage motors are suitable for Part Winding Start on Low Voltage (250 Frame & Larger)
 - Single Voltage motors also suitable for Part Winding Start (100 HP or larger)
- Depicting UL^{®†} File Number Fire Pump Tags

UL Listed Fire Pump NEMA frame motors (ODP & TEFC) can be supplied as Energy Efficient, since they are exempt from EISA - 2007 / IHP HP Motor Final Rule 2016 (NEMA Premium), unless the customer requests Premium Efficiency.

20. Foot Flatness, Special

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	75	75	75	225	225	225	450	450	450	450

0.005" Foot Flatness from mounting hole to mounting hole. Available on Cast Iron Frame Hazardous Location motors, 180 Frame and larger. Standard (no charge) on 841 PLUS[®] motors.

21. Footless (Round Frame)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	150	150	150	225	225	300	375	450	450	450

Footless motors require either a C-Face or D-Flange. Refer to the "Endshield, C-Face/D-Flange" option. Refer to the "Drip Cover (Canopy Cap)" option and Lifting Provisions options. Mounting orientation (Horizontal, Vertical Shaft Down or Vertical Shaft Up) must be specified at order entry. Footless not available on ODP or Hazardous Location 449 Frame. ODP Energy or Premium Efficiency motors in 360-400 Frames are not available as Horizontal Footless motors. They must be built as Vertical Motors (for Vertical Motors, see Catalog PB500).

22. Frequency, 50 Hertz

A. 50 Hertz, Open Drip Proof (ODP)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

See Option B for TEFC and Hazardous Location 50 Hertz adder, and for notes.

B. 50 Hertz, Totally Enclosed Fan Cooled (TEFC) & Hazardous Location

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. The Frequency adder includes 50 Hz, 1.0 Service Factor. If higher Service Factor is required, the Service Factor adder must also be used. The Frequency adder is used when the primary rating is 50 Hertz. Some motors can be built with a Dual Rating (60 Hertz primary rating and 50 Hertz secondary rating). If 50 Hertz is specified as the secondary rating, this adder is not required.

Unless specified otherwise at order entry, the following motors have a 50 Hertz secondary rating as standard:

- Energy Efficient ODP and TEFC with 60 Hertz, 230/460 or 208-230/460 volts Primary Rating have a 50 Hertz, 190/380 Volts Secondary Rating
- Energy Efficient ODP and TEFC with 60 Hertz, 460 Volt Primary Rating have a 50 Hertz 380 Volt Secondary Rating
- The secondary rating is always 1.0 Service Factor.

23. Grease Fittings

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	173	173	173	173	173	173	173	173	173	173	173	173

Grease Fittings are available in a variety of options:

- Grease Fitting on Fill, with Pressure Drains
- Grease Fitting on Fill, with Plug on Drain
- Plug on Fill and Drain

Grease Fitting on Fill with Plug on Drain is standard (no charge) as follows:

- All motors (except UNIMOUNT[®]) 250 Frame and larger, both ends
- CORRO-DUTY[®] 180-210 Frame, both ends
- 56-140 Frames have sealed bearings and no grease fittings
- UNIMOUNT[®] 180-280 Frame, pulley end only
- Hazardous Location, 180-210 Frame, both ends
- 180 Frame Hostile Duty not available

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

24. Grounding

A. Grounding Lug or Servit Post in Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	120	120	120	120	120	120	120	120	120	120	120	120

All motors have provisions for grounding (stud in the main conduit box). Use this adder for a Ground Lug or in the main conduit box. Ground Lug in main conduit box is standard (no charge) on CORRO-DUTY[®], 841 PLUS[®] and Hazardous Location motors. Also use this adder for a Ground Lug or Servit Post in an accessory conduit box. Refer to the "Conduit Box, Accessory" option for availability of accessory boxes.

B. Grounding Terminal in Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

All motors have provisions for grounding (stud in the main conduit box). Use this adder for a Ground Terminal in the main conduit box. Also use this adder for a Ground Terminal in an accessory conduit box. Refer to the "Conduit Box, Accessory" option for availability of accessory boxes.

C. Grounding on Frame

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for List Price adders. There are several options available for grounding on the frame:

- Tapped Hole on Foot (Q1 or Q2) – not available on ODP 56-320 Frame motors or Footless Motors
- Ground Terminal on Frame (Q1 or Q2) – not available on ODP 56-320 Frame motors or Hazardous Location motors
- Ground Pad (Q1 or Q2) – not available on 56-400 Frame or Hazardous Location motors

Double the adder for quantity two. Frame Grounding is always in addition to, not in lieu of, Conduit Box Grounding.

The Conduit Box Ground is the "primary ground."

D. Shaft Ground Ring

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Not Available On UL Listed Hazardous Location Motors. Inpro/Seal^{®†} XP MGS^{®†} is only available on TEFC 440 frame, if Self Certified (Non-Listed) Division 2 and CSA^{®†} Certified Division 2.

A shaft grounding ring is included in the Inverter Duty Base List Price on all Inverter Duty offerings (Excluding Hazardous Location and Cooling Tower Duty). If a specific device is required, please advise at time of order (subject to additional adder).

25. Hardware, Stainless Steel

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	225	225	225	225	225	225	420	420	420	420	420	435

All motors are built with Corrosion Resistant Hardware. When Stainless Steel Hardware is specified, all hardware required for Endshields, Fan Cover, Bearing Caps (if applicable), Conduit Box and Fan are changed to 316 Stainless Steel.

26. High Inertia Load

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. Refer to Appendix for standard Load Inertia values. Use this adder for values higher than listed in the table. Application details, including load inertia reflected to the motor shaft, must be reviewed prior to entering an order. When this is required, contact your Nidec Motor Corporation Technical Representative for assistance.

27. Horsepower, Non-Standard

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)

(4) It is best to use a Standard NEMA^{®†} horsepower rating whenever possible, however non-standard horsepower ratings can be designed. Use the Base List Price of the next higher standard horsepower of the same motor type and speed.

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors

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28. Insulation Class

A. Class F

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD

Insulation systems are divided into classes according to the thermal endurance of the system for temperature rating purposes. Four classes are used in motors and generators, namely Classes A, B, F and H. Two of these classes are used by Nidec Motor Corporation: Class F and Class H. Class F is the standard Nidec Motor Corporation Insulation System.

- Class F Insulation System is one which by experience or accepted test can be shown to have suitable thermal endurance when operating at the limiting Class F temperature specified in the temperature rise standard for the machine under consideration.
- All products described in this catalog are manufactured with copper magnet and lead wire. Aluminum wire is not available.
- All production-modified products are supplied with Class F insulation as standard.
- Inverter-duty products are supplied with a special insulation system that is described in item 08 of this section.
- Class H insulation is an available option for special ambient conditions, inverter duty applications, insulation life requirements, etc.
- Temperature-rise considerations are described in item 49 of this modification section.

INSULATION CLASS

Common designations include Class B, F, and H. These indicate the maximum thermal capability of each system based on providing a life expectancy in accordance with IEEE guidelines and industry standards. The following table illustrates the various elements and their contribution to the insulation systems.

INSULATION CLASS	A ¹	B	F	H
Ambient temperature (for options see item 2 of this modification section)	40°C	40°C	40°C	40°C
Temperature rise at nameplate H.P. (for options see item 44 of this modification section)	60°C	80°C	105°C	125°C ²
Hot spot or service factor allowance (for service factor see item 44 of this modification section)	10°C	10°C	10°C	15°C
Thermal limit of insulation system ³	105°C	130°C	155°C	180°C
NOTES:				
¹ Class A insulation system shown for reference only and is not commercially available from Nidec Motor Corporation.				
² Class H insulation is offered for special ambient conditions, life requirements, etc. Class H temperature rise is not available or used by Nidec Motor Corporation.				
³ Each insulation class provides the same winding design life when operated at its thermal limit.				

Any deviation from insulation class standards stated on individual price book pages requires the appropriate modification adder and may impact frame size and performance characteristics.

B. Class H

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	114	114	159	192	252	420	552	708	1023	1218	1686	1686

Insulation systems are divided into classes according to the thermal endurance of the system for temperature rating purposes. Four classes are used in motors and generators, namely Classes A, B, F and H. Two of these classes are used by Nidec Motor Corporation: Class F and Class H.

- Class H(180°C) Insulation System is one which by experience or accepted test can be shown to have suitable thermal endurance when operating at the limiting Class H temperature specified in the temperature rise standard for the machine under consideration. Refer to office for ambients above 60°C.

29. Insulation System

A. Insulife 1000

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD

Standard treatment for frame sizes up through 440. Insulife 1000 utilizes 100% solid polyester resins completely impregnating slot end turns. The standard process is Non-Hygroscopic Class F (155°C), suitable for ODP motors in a relatively dry environment or for TEFC motors with moderate exposure to moisture. One dip and bake in polyester resin.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

29. Insulation System *(continued)*

B. Insulife 2000

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	50	50	65	102	131	218	278	342	461	597	780	780

Insulife 2000, an additional treatment of polyester varnish ideal for applications with high moisture content. Two dips and bakes. Standard on CORRO-DUTY[®] and Inverter Duty motors.

C. VPI 1000

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	600	750	900	1050	1350	1575	1575

VPI 1000: One cycle of vacuum impregnation of 100% solid epoxy resins. Available on 280 Frame - Cast Iron only, and all 320-440 Frames.

D. VPI 2000

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	750	957	1124	1584	1881	2321	2321

VPI 2000: Two cycles of vacuum impregnation of 100% solid epoxy resins. Meets NEMA definition for moisture-resistant winding per NEMA MG1 - 1.27.1. Available on 280 Frame - Cast Iron only, and all 320-440 Frames.

E. Abrasion Resistant Coating

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	51	51	51	81	104	173	221	272	365	474	474	474

Optional overcoat treatment available with any Nidec Motor Corporation insulation systems. Abrasion Resistant Coating protects against environments contaminated with abrasive dust such as fly-ash, cement dust, etc.

F. Dolph Treatment

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	50	50	65	102	131	218	278	342	461	597	780	780

Dolph Treatment, an additional stator coating to provide an extra level of internal protection for high moisture environments. Standard on Cooling Tower Duty.

G. Tropical Protection

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)

(5) For Tropical Protection, add for Insulife 2000 Insulation System and screens (on ODP motors).

30. Inverter Duty (Automotive Duty and Washdown Duty)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. This adder is for Inverter Duty Automotive Duty and Washdown Duty motors – 10:1 Variable Torque Speed Range or 5:1 Constant Torque Speed Range. For 10:1 Constant Torque Speed Range, use Base List Price of the next higher horsepower plus this adder. Other Inverter Duty motors have their own Base List Prices. Refer to the Base List Price section.

31. Kiln Duty

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%

Adder is percent of Base List Price. Kiln Duty motors are specifically designed for Kiln Applications. Each application is different, and the customer's specific requirements must be reviewed. Typical product features include:

- Totally Enclosed Air-Over (TEAO) Enclosure
- High Ambient Temperature
- Class H Insulation
- High Temperature Grease
- Special Grease Fitting arrangements
- Sealed (Potted) Leads
- Longer than Standard Motor Leads

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[†] Horizontal Motors

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32. Leads

A. Longer Than Standard (Q1 to 5), Adder Per Foot

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	113	113	113	113	113	113	113	113	113	113	113	113

B. Longer Than Standard (Q6 +), Adder Per Foot

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	68	68	68	68	68	68	68	68	68	68	68	68

C. Sealed (Potted)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	413	413	413	413	443	450	549	609	620	780	800	800

Sealing compound applied around the leads at the lead outlet opening to separate leads, and to seal outlet to prevent contamination from entering the motor. Standard (no charge) on Hazardous Location motors. Not available on Open Drip Proof (ODP) motors.

D. Special Terminations

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

33. Lifting Provisions (Both Horizontal & Vertical)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	90	90	128	128	173	173	218	240	240	240

Either Horizontal or Vertical Lifting Provisions, based on the Assembly Position, are supplied as standard (no charge) on the following:

- Open Drip Proof motors 210 Frame and larger
 - Totally Enclosed motors 180 Frame and larger
- Use the Lifting Provisions adder for motors requiring both Horizontal and Vertical Lifting Provisions.

34. Lubrication

A. High Temperature Grease

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	150	150	150	250	320	390	525	685	890	890

B. Low Temperature Grease

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	150	150	150	250	320	390	525	685	890	890

Mobil[®] 28 (or equal) grease for temperatures below -30°C. Low Temp Grease is standard (no charge) if Arctic Duty is selected. Cannot have Low Temp Grease with Double Sealed Bearings.

C. Washdown Duty Grease

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	75	75	75	75	75	125	160	195	265	340	445	445

Keystone Nevastane[®] (or equal) grease, standard on Washdown Duty motors.

[†] All marks shown within this document are properties of their respective owners.



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Accessories and Modifications

34. Lubrication (continued)

D. Oil Mist Provisions (Ball Bearing Motors Only)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	375	375	375	375	375	570	570	975	1650	1650	2025	2025

Includes providing the Motor with provisions to accommodate Oil Mist Lubrication. An Oil Mist Lubrication System (supplied by others) is a centralized system in which the energy of compressed gas, usually air taken from the plant supply, is used to atomize oil. The oil is then conveyed by air in a low pressure distribution system to application fittings on the Motor mist fittings which meter oil to bearing housings). Available on Enclosed Motors only.

35. Marine Duty

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Marine Duty is available per IEEE-45 Specifications for either Above Deck or Below Deck operation. IEEE-45 requires that motors exposed to the weather, seas, splashing or other severe moisture conditions either be water tight or protected by watertight enclosures.

Since electric motors breathe during operation, they cannot be constructed as watertight. Above Deck motors must be protected by suitable watertight enclosures. Below Deck motors should be located to avoid splashing bilge water. Above Deck also requires CORRO-DUTY[®]. Open Drip Proof (ODP) motors can only be used Below Deck.

NOTE: IEEE 45 requires that motors exposed to the weather, seas, splashing or other severe moisture conditions either be watertight or protected by watertight enclosures. Since electric motors "breathe" during operation, they cannot be constructed as watertight. Above-deck motors must be protected by suitable watertight enclosures.

36. Multi-Speed Motors

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing.

Base List Price:

• Variable & Constant Torque - use base list price of High Speed HP & Poles

• Constant Horsepower - use base list of High Speed HP & Low Speed Poles

This adder includes Multi-Speed with 1.0 Service Factor. If higher Service Factor is required, the Service Factor adder must also be used. The following charts show typical Frame Size adjustments for Multi-Speed (over the standard Single Speed Base Frame Size):

Poles	Speed (RPM)	Variable Torque		Constant Torque		Constant Horsepower	
		1-Wdg	2-Wdg	1-Wdg	2-Wdg	1-Wdg	2-Wdg
2/4	3600/1800	Base	N/A	+1	N/A	+1	N/A
4/6	1800/1200	N/A	+2	N/A	+2	N/A	+1
4/8	1800/900	SEE HP TABLE BELOW					
4/12	1800/600	N/A	+2	N/A	+2	N/A	+1
6/8	1200/900	N/A	+2	N/A	+2	N/A	+1
6/12	1200/600	Base	+2	+1	+2	+1	+1

HP	Speed (RPM)	Variable Torque		Constant Torque		Constant Horsepower	
		1-Wdg	2-Wdg	1-Wdg	2-Wdg	1-Wdg	2-Wdg
1/3-2	1800/900	Base	+2	+1	+2	+1	+1
3-20	1800/900	Base	+2	+2	+3	+1	+1
25-60	1800/900	+1	+2	+2	+3	+1	+1
75+	1800/900	+1	+2	+1	+2	+1	+1



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37. Nameplates

A. Additional Duplicate Nameplate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

An Additional Duplicate Nameplate for mounting on customer equipment can be furnished when specified with the order. These additional nameplates cannot be supplied with CSA^{®†} or UL^{®†} logos.

B. Additional Stamping On Main Nameplate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	75	75	75	75	75	75

The main motor nameplate can be stamped with limited customer tagging information (20 characters max).

C. Phase Sequencing Plate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

Direction of rotation must be specified at order entry.

D. Rotation Arrow Plate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

Metal Plate mounted on motor with arrow showing direction of rotation. Customer must specify required direction of rotation:

- Counterclockwise facing opposite drive end
 - Clockwise facing opposite drive end
 - Dual rotation (not available on all ratings)
- Supplied as standard on motors with Uni-Directional Fans.

E. Shipping Tag (#6 Paper Tag)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

A #6 Paper Shipping Tag, with customer tagging information, can be supplied at no charge when specified at time of motor order.

F. Special Features (I.D.) Nameplate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	75	75	75	75	75	75

Special Identification Plates can be mounted on the motor with limited customer specified tagging information (100 characters max).

G. Starting Duty Nameplate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

Starting Duty Plate listing number of allowable starts in succession and required "off" time between subsequent starts. Customer's Load Inertia is required at order entry. A Starting Duty Plate is required if the number of starts is anything other than NEMA^{®†} Standard.

38. Paint

A. Nidec Motor Corporation's Standard Paint For CORRO-DUTY[®] Motors

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

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38. Paint (continued)

The motor will be painted with Nidec Motor Corporation's standard paint used for CORRO-DUTY[®] motors (unless Special Paint is specified), including:

- On Open Motors: exterior of motor, interior unmachined surfaces of brackets, bracket grills (if any), exterior unmachined surfaces of bearing caps (if any) and air deflectors (if any)
- On Enclosed Motors: exterior of motor, exterior unmachined surfaces of Short End bracket, interior unmachined surfaces of fan cover, metal fans (if used) and sheet metal parts exposed to exterior atmosphere (if any)

Only applicable to Non-CORRO-DUTY[®] motors.

B. Special Paint

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	225	300	375	450	525	600	675	750	750	750

Special paint must be approved by the plant prior to quoting. A Material Safety Data Sheet (MSDS) must be sent to the plant for their review. Special paint can be furnished (once approved) if compatible with our standard primer, is commercially available, and suitable for air drying (paints containing lead or zinc cannot be used, and sand blasting is not available). Motors can be supplied with just the standard primer at no charge, if requested at time of order.

39. Prints & Data (Submittals) (Net Adders)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick List for pricing. Submittals adders are NET ADDERS. The following submittals are considered Standard Submittals, and are available at no charge if requested at the time of motor order:

- Certified Dimension Print
- Bearing Life Calculation
- Instruction Manual
- Wiring Diagram
- Rotor Inertia
- Performance Data
- Conduit Box Details
- Parts List
- Recommended Spare Parts
- Cut Sheets for Accessories
- Nameplate Data
- Major Component Weights
- Paint Specification
- Rotor Air Gap (Calculated)

40. Purge Ports

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	375	375	375	375	375	570	570	975	1650	1650	2025	2025

Arrange motor to accommodate Air Purging Systems. Drilled and tapped holes in each end of the motor. Used in applications where the air must be purged out of the motor prior to startup.

41. Screens

A. Standard Material

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	255	308	375	555	578	578	578

Corrosion-Resistant rodent screens provided over the air inlet and air outlet openings. Available on Open Drip Proof (ODP) motors. Available on 280 frame and above.

B. Stainless Steel

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	275	378	549	828	864	864	864

Stainless Steel rodent screens provided over the air inlet and air outlet openings. Available on Open Drip Proof (ODP) motors. Available on 280 frame and above.

42. Sealant

A. Rotor Assembly Treatment Used On CORRO-DUTY[®] Motors

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

Coating of rotor assembly, standard on CORRO-DUTY[®] motors.

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

42. Sealant (continued)

B. Internal Sealer for Washdown

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	50	50	65	102	131	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Internal components treated with a red-colored moistureproof sealer, including inside of frame, stator core endcoils, stator bore and rotor core. Available on 56-250 Frames. Standard (no charge) on Washdown Duty motors and motors with Washdown Features (56-250 Frame).

C. RTV[†] Sealant or Loctite^{®†}

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	90	90	90	128	173	173	218	218	240	300	375	450

Silicon sealant applied to registers between the end brackets and frame and/or under bolt heads to prevent contaminants from entering the motor. Not available on Hazardous Location motors. The following sealant options are available:

- "RTV[†]" sealant on registers between brackets and frame
- Loctite^{®†} on bolts

43. Seals (Price Each)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing.

Shaft Slinger: Installed on the shaft at the bracket face to prevent the ingress of dirt and liquid. Usually made of rubber. Standard (no charge) on Cast Iron Frame motors and all C-Face and D-Flange motors.

Inpro/Seal^{®†} Bearing Isolators: This is a permanent, metallic, non-contact, non-wearing, radial-axial labyrinth pattern isolator. This design permanently retains the lubricant in the bearing housing and prevents entry of foreign material in the bearing environment.

- Inpro/Seal^{®†} Bearing Isolators on both ends are standard (no charge) on 841 PLUS[®] motors
- Only available on CORRO-DUTY[®] and Hostile Duty motors.
- Not available on 140 Frame Hazardous Location motors or Class II Hazardous Location motors.

Protec^{®†} Seal: Graphite reinforced Teflon seal. Same restrictions as for Bearing Isolators by Inpro/Seal^{®†}.

- Not available on 140 Frame Hazardous Location motors or Class II Hazardous Location motors.

Taconite Service: Motor for dust atmospheres of taconite cement in mild concentrations. For higher concentrations of dust, refer to office.

- Not available on UNIMOUNT[®] motors, Open Drip Proof (ODP) motors, or Washdown Duty motors.
- Not available on 140 Frame Hazardous Location motors or Class II Hazardous Location motors.

Lip Seals: These seals provide a rubber shaft seal to exclude contaminants such as oil, water and dust from entering the bearing cavity.

- Not available on 440 Frame motors, 140 Frame Hazardous Location motors or Class II Hazardous Location motors.

44. Service Factor

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	57	57	80	96	126	210	276	354	512	726	1574	1574

Service Factor adder is only used where motor does not have service factor as standard. Make the Service Factor adder for the following:

- 50 Hertz with Service Factor
- Dual Label Hazardous Location with Service Factor
- Multi-Speed with Service Factor
- Service Factor greater than 1.15 (except for UNIMOUNT[®])

This option may influence frame size and performance characteristics. Published or guaranteed data will change when product is operated over nameplate HP. Motors will be Class B temperature rise at nameplate HP, Class F temperature rise at 1.15 S.F. For temperature rise options, refer to item 49 on page 94 of this section. Frame and performance characteristics may change.

Contact your Nidec Motor Corporation Technical Representative for 1.15 S.F. on motors installed in a Division 1 and Division 2 locations.

Contact your Nidec Motor Corporation Technical Representative for service factor requirements greater than 1.15 S.F.

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

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45. Shaft Extensions

A. Close Coupled Pump (If No Base List Price for Close Coupled Pump)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	128	128	180	188	245	381	536	758	1104	1127	N/A	N/A

This This adder is only used when there is no Close Coupled Pump (CCP) Base List Price. Refer to Base List Price section. These motors are designed for the specific application of Close Coupled Centrifugal Pumps. Available with "JM," "JP," "JPZ" and "JPY" Shaft Extensions. NEMA^{®†} defines "JM" Shafts through 320 Frame and "JP" Shafts through 360 Frame. Larger frame sizes are labeled "TCZ," and the customer must supply the shaft dimension details.

B. Base Adder (Q-1 Motor)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	438	438	438	525	567	638	690	813	953	1127	1197	1197

This is the Base Adder to cover engineering and manufacturing costs of a special shaft. The quantity breaks are quantity per order. The adders for Locknut, Tapered Shaft, Tapped Hole and/or Threaded Shaft must also be made, where applicable. This adder is not required for Standard Double Shaft Extension, Special Shaft Material and/or Rust Preventative, if those are the only things special about the shaft. Customer should supply a shaft drawing whenever possible.

C. Base Adder (Q-2 to Q-4 Motors)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	200	200	206	210	219	254	288	327	384	464	498	498

D. Base Adder (Q-5 or More Q-4 Motors)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	62	75	87	123	153	188	227	279	279	279

E. Special Material, 303 Stainless Steel

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	110	110	110	245	345	516	939	1202	1748	1887	1983	1983

This adder covers 303 Stainless Steel Shaft material. 303 Stainless Steel Shaft is standard (no charge) on Washdown Duty motors. For 50 HP and smaller, 2 Pole, refer to office for frame size.

G. Special Material, 416 Stainless Steel Or Special Material, Other

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	219	219	219	489	690	1032	1878	2403	3495	3774	3966	3966

This adder covers other Stainless Steel or High Tensile Steel Shaft material. For 50 HP and smaller, 2 Pole, refer to office for frame size.

H. Special Shaft Runout

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	438	438	438	525	567	638	690	813	953	1127	1197	1197

I. Standard Double End Extension

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	54	54	54	87	105	156	246	333	393	480	507	507

J. Tapped Hole

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	45	45	45	68	68	83	105	113	128	150	158	158

Customer must specify thread size and depth.

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors

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45. Shaft Extensions *(continued)*

K. Threaded Shaft (External Thread)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	45	45	45	68	68	83	105	113	128	150	158	158

Customer must specify thread size and length.

L. Locknut On End

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	38	38	38	38	38	38	38	38	38	38	38	38

A locknut can be supplied by Nidec Motor Corporation when an external thread on the shaft extension is requested. Also requires the adder for Threaded Shaft.

M. Rust Preventative (Non-Standard)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	38	38	38	38	38	38	38	38	38	38	38	38

A solvent soluble coating applied to the shaft extension to prevent rust from forming on the metal. Use this adder for Rust Preventatives other than the Nidec Motor Corporation standard. Non-Standard Rust Preventative requires approval prior to quoting.

N. Tapered Shaft

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	60	60	75	90	105	135	1580	165	195	210	210	210

Customer must supply the length and pitch of the taper at order entry. The pitch can be defined in multiple ways:

- Degrees
- Rise over run
- Length, with the starting and ending diameter

46. Space Heaters

A. Standard Silicone Strip Heaters (Double For Hazardous Location & Division 2)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	219	219	219	219	219	327	327	393	480	569	642	642

Space Heaters are installed to prevent moisture condensation in the motor during times the motor is not running. Nidec Motor Corporation uses Silicon Rubber Strip-Type heaters manufactured by sandwiching a resistance wire network between two pieces of high-temperature silicon rubber and bonding the pieces together. Heaters are sized to provide approximately 10°C temperature rise above the ambient temperature. Heaters are placed on the end turns of the motor winding. Heaters are of the low-density type, which yields low surface temperature and long life. Heaters are single phase, rated 60 or 50 Hertz.

Space Heaters are available in the following voltages:

- 115, 200, 208, 230, 380, 460 & 575 Volt
- 227 Volt operated at 300 Volt
- 230 Volt operated at 115 Volt
- 460 Volt operated at 230 Volt

Double the adder for Hazardous Location motors or Division 2. Double the adder for half-voltage space heaters. (For Hazardous Location or Division 2 motors with half-voltage heaters, the adder is 4 times.)

B. Thermostatically Controlled Space Heater with Pilot Light

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	2441	2441	2441	2441	2441	2441	2441	2441

This adder is in addition to the Space Heater adder. Calibrated (preset) thermostatic control accessory is mounted in the motor conduit box. A Pilot Light is located on the space heater conduit box to indicate space heater operation. Not available on Hazardous Location motors.



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47. Starting Current, Lower Than Standard

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Adder is percent of Base List Price. The starting current varies with each rating based on the NEMA^{®†} KVA Code Letter and the exact electrical design that is used. This adder covers any starting current limit (inrush limit) that is not the standard value for the rating.

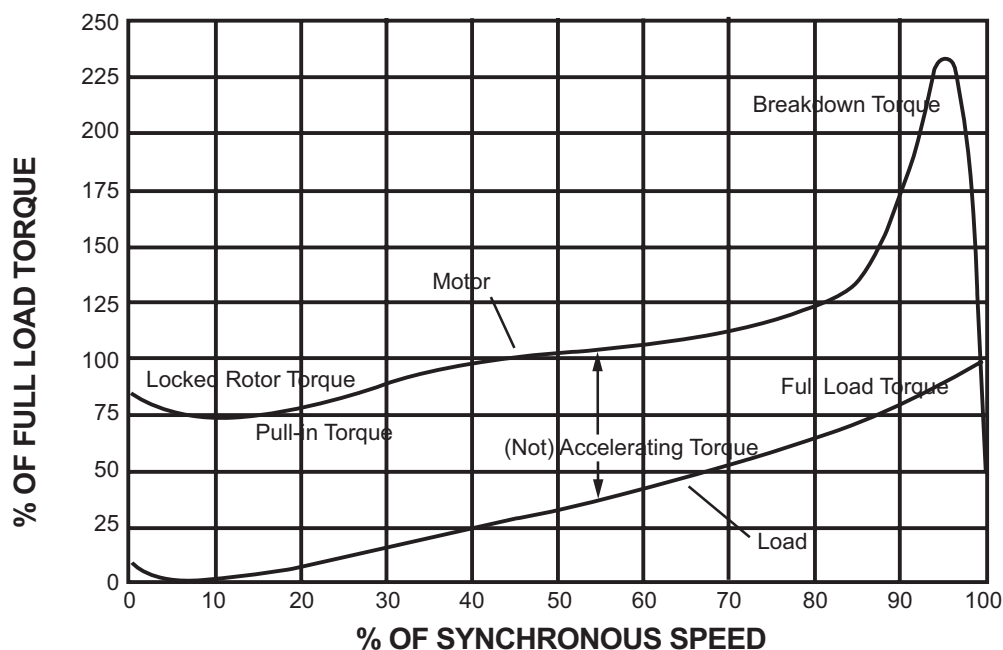
CAUTION: Not all starting current limits can be met on all ratings. Confirm that the limit can be met prior to quoting.

48. Starting Method

- Products described in this catalog are assumed to be used with the full voltage across the line starting method.
- Nameplate (HP) ratings assume product is applied to a power distribution system with balanced line voltage. Distribution systems using an asymmetrical transformer bank (typically open Wye, open Delta connection) almost always produce unbalanced line voltage conditions leading to premature motor failure.
- Standard products described in this catalog may be capable of alternative starting methods, provided certain basic requirements are met:
 - > Motor must be capable of accelerating the load under the specified starting method without exceeding the allowable temperature rise of the rotor or stator.
 - > Motor must produce adequate torque at all points along the driven equipment load curve so as not to stall at an intermediate load point.

Products described in this catalog can be connected directly across the line without damage to the motor. However, the typical motor draws 6 to 7 times its full load current during starting. These are situations where this starting or in-rush current can cause excessive voltage disturbance on the power supply system, potentially causing operational problems with other equipment. Reducing voltage to the motor during starting is a common method of controlling in-rush current. Reducing voltage to the motor during starting also reduces the starting torque and breakdown torque, which increases the time it takes the motor to accelerate.

TYPICAL SPEED-TORQUE CURVE



Should the starting torque be reduced at some point along the speed torque curve to where there is no longer a net accelerating torque value, the motor will stall and can be damaged if not taken offline within its safe stall time window. Comparing the load speed torque curve with the motor's capabilities under reduced voltage starting conditions -- is recommended, particularly when 50% of nameplate voltage is used to start the motor (50% tap on auto transformer). Motors started by auto-transformer or solid-state soft-starting methods require customer to provide speed torque curve of driven equipment, voltage tap on transformer and WR2 of load.

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48. Starting Method *(continued)*

TYPICAL COMPARISON OF COMMON STARTING METHODS (%)					
STARTING METHOD	MOTOR			LINE	NOTES
	TERMINAL VOLTAGE	STARTING TORQUE	STARTING CURRENT	STARTING CURRENT	
Full Voltage	100	100	100	100	Standard Motor
PWS (High Speed)	100	50	70	70	Special Winding
PWS 514 RPM + Below	100	50	50	50	Special Winding
Wye-Delta	100	33	37	33	Special Winding
AUTOTRANSFORMER	80	64	80	67 *	*IncludesTransformer magnetizing current
80% TAP					
65% TAP					
50% TAP					
PRIMARY RESISTOR AND PRIMARY REACTOR ARE SIMILAR TO AUTOTRANSFORMER METHOD					

Starting Method

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	78	78	78	110	131	158	231	363	603	633	633

There are a number of ways to start squirrel cage induction motors, and each method has its own characteristics and place of correct application. It is important to understand that applications requiring any of these starting methods necessitate careful consideration of the motor torque and load torque to insure that the motor can accelerate the load.

- Direct On Line (Across The Line) Start: Considered the Standard Starting Method except on Energy Efficient Motors in 250-449 Frames. Available at no charge.
- Part Winding Start: This method uses only a portion (usually 1/2, but sometimes 2/3) of the motor winding when starting the motor. It is to be used only for voltage recovery and must not be left on the start connection for more than 1 to 2 seconds. The motor is not expected to accelerate on the start connection, and may not even turn.
 - Available at no charge on Single Voltage Motors rated 277 Volts & down
 - Use the Starting Method Adder for all other ratings.
 - On Dual Voltage Motors, you get Part Winding Start only on the low voltage. If Part Winding Start is required on the high voltage, then Single Voltage must be specified.
- Wye Start/Delta Run: A method of reduced voltage starting. This method uses a special Motor Starter to start the motor using a “wye” connection, then switch to “delta” connection for running.
 - Available at no charge on Energy Efficient Motors and Fire Pump Motors in 250-440 Frames.
 - Make the Starting Method Adder for all other ratings.
- Reduced Voltage Starting: This method applies a reduced voltage during motor starting in order to lower the starting current (also lowers the starting torque). Common methods are Solid State Soft Start and Autotransformer.
 - The application details (load torque, load inertia and percent starting voltage) must be reviewed prior to order entry to insure that the motor has adequate starting torque.
 - There is no adder for Reduced Voltage Starting, however, if a High Torque Design is required, the “Torque, High” Adder must be used.
 - Wye Start/Delta Run connection should be requested to insure suitable lead configuration.



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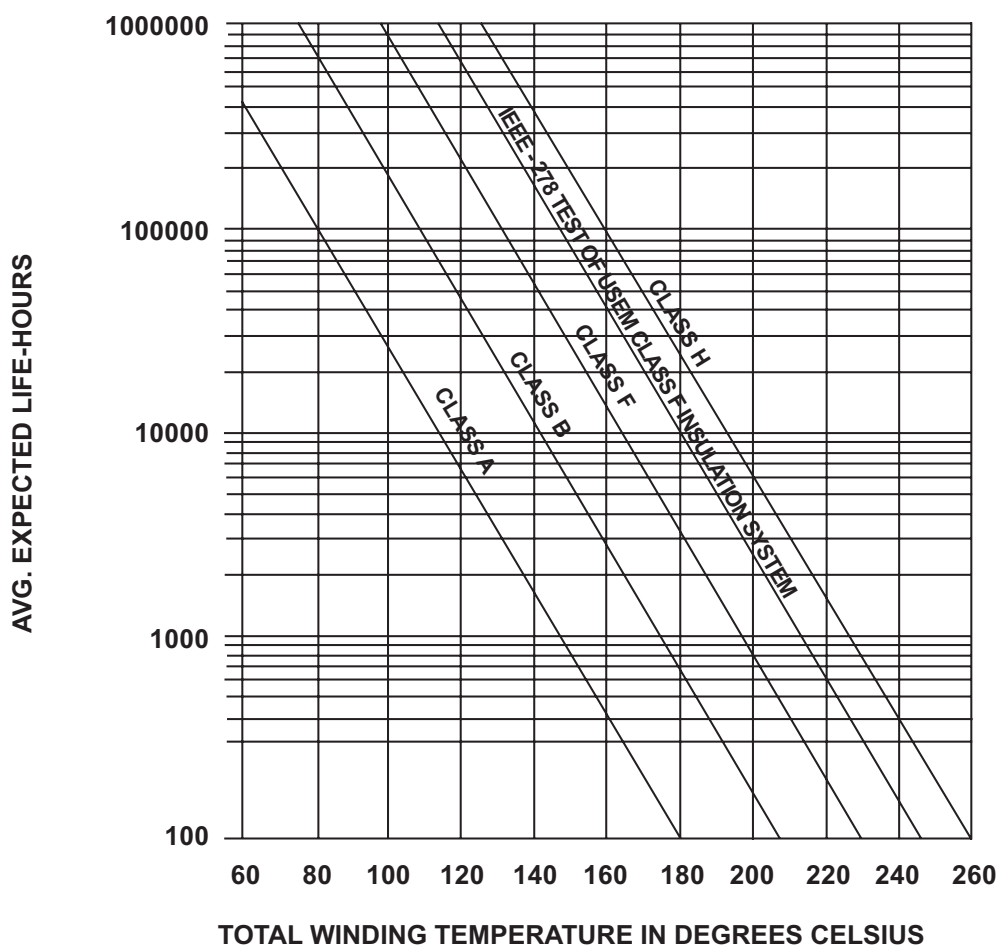
49. Temperature Rise, Standard And Optional

- This option may not be available on the maximum HP rating in a given frame size. Consult your Nidec Motor Corporation Technical Representative for availability.
- This option may change motor frame size and performance characteristics. Consult your Nidec Motor Corporation Technical Representative for confirmed data.
- Combined with other design altering modifications (high ambient, high altitude, VFD use, etc.), this option will significantly change listed product performance described in this catalog. Consult your Nidec Motor Corporation Technical Representative for confirmed frame size, performance data, etc.
- The description of this product feature assumes the motor is applied to sine wave power and in accordance with NEMA standards (standard ambient, altitude, balanced voltage, etc.).

The standard insulation system supplied on all Nidec Motor Corporation products described in this catalog is Class F. When our Class F system is subjected to insulation life testing as described in IEEE 275, it significantly exceeds the thermal capabilities required to classify it as capable of providing 20,000 hours of design life when operated at the Class F thermal limit of 155°C. Chart 45-1 indicates the thermal capabilities of our standard insulation system, which is shown as the diagonal line slightly below Class H.

CHART 49-1

TYPICAL TEMPERATURE VERSUS LIFE CURVES FOR INSULATION SYSTEMS



IEEE standards assume winding design life doubles with a 10°C decrease in temperature rise and is halved with a 10°C increase. An insulation system operating at its thermal limit has a design life of 20,000 hours (about 2.3 years). Considering the standard thermal limits for Class F for 155°C and our design practice of 130°C total temperature rise under load, Nidec Motor Corporation provides about 100,000 hours -- 5 times the industry standard -- of winding life. This is one reason there are so many old U.S. MOTORS[®] horizontal motors still in operation today.

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49. Temperature Rise, Standard And Optional *(continued)*

INSULATION CLASS	A ⁽¹⁾	B	F	H
	40°C	40°C	40°C	40°C
	60°C	80°C	105°C	125°C ⁽²⁾
	10°C	10°C	10°C	15°C
Thermal limit of insulation system ⁽³⁾	105°C	130°C	155°C	180°C
NOTES: ⁽¹⁾ Class A insulation is shown for reference only and is not commercially available from Nidec Motor Corporation. ⁽²⁾ Class H insulation is offered for special ambient conditions, life requirements, etc. Class H temperature rise is not available or used by Nidec Motor Corporation. ⁽³⁾ Each insulation class provides the same winding design life when operated at its thermal limit.				

Any deviation from Insulation Class standards stated on individual pricebook pages requires the appropriate modification adder and may impact frame size and performance characteristics.

A. "B" Rise at 1.00 Service Factor

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD

Class "B" Rise at 1.00 service factor (Full Load) is considered the standard temperature rise.

B. "B" Rise at 1.15 Service Factor

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. Use this adder for Class "B" Rise at Service Factor. This includes the following options:

- "B" Rise at Service Factor (by resistance)
- "B" Rise at Service Factor (by embedded detector)
- 85°C Rise at 1.15 Service Factor (by resistance)

C. Class "A" Rise

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%

Adder is percent of Base List Price. Use this adder for Class "A" Rise at 1.00 Service Factor (Full Load). This includes the following options:

- "A" Rise at 1.00 Service Factor (by resistance)
- 60°C, 65°C, 70°C or 75°C Rise at 1.00 Service Factor (by resistance)

CAUTION: Temperature Rise below normal may require a larger frame size. Confirm frame size prior to quoting.

D. Less Than Class "A" Rise

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%

Adder is percent of Base List Price. Use this adder for any temperature rise less than Class "A". This includes the following option:

- 40°C, 45°C, 50°C or 55°C Rise at 1.00 Service Factor (by resistance)

CAUTION: A Temperature Rise this low will almost always require a larger frame size. Confirm frame size prior to quoting.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

50. Tests (List Pricing)

All completely assembled motors receive a production test prior to shipment from the factory. This test confirms conformance to Nidec Motor Corporation design and no specific values are recorded. The exact nature of this test varies by motor type, but as a minimum, the motor is run at no load and visually inspected. There is no extra charge for a production test, and this test requirement does not need to be noted at order entry. Other testing is available as follows:

- Short Commercial Test (meets NEMA MG1-12.55 or Part 20 for Titan[®] motors) -- This test consists of no-load current, locked rotor current, winding resistance, and high potential.
- Short Commercial Test Witnessed -- A short commercial test, as described above, performed in the presence of a witness.
- Complete Initial Test -- Nidec Motor Corporation tests per IEEE Standard 112, method B, dynamometer test. This test consists of full-load heat run, percent slip, no-load current, full-load current, locked rotor current, lock rotor torque, breakdown torque (calculated), efficiency and power factor at 100%, 75%, and 50% full load, insulation resistance per IEEE Standard 43, winding resistance and high potential.
- Calibrated Test -- Same as complete initial but curves are provided to customer.
- Sound Test -- This is a no-load test performed in accordance with ANSI S12.51 and NEMA MG-1. For details on how this is performed, refer to Product Facts.
- Sound Test Witnessed -- A sound test, as described above, performed in the presence of a witness.
- Vibration and Special Testing -- Refer to the Nidec Motor Corporation Technical Representative for details and capabilities.
- Polarization Index -- In accordance with IEEE Standard 43. Dielectric absorption ratio.
- Inverter with motor -- Refer to the Inquiry Group for engineering and plant approval.

A. Short Commercial Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	200	200	200	200	200	200	200	200	200	200	200	200

B. Short Commercial Test, Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	625	625	625	625	625	625	625	625	625	625	625	625

C. Complete Initial Test, Un-Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1180	1180	1180	1180	1180	1180	1820	2360	2780	3860	3860	3860

(8) For Multi-Speed motors, multiply the adder by 1.5.

D. Complete Initial Test, Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1805	1805	1805	1805	1805	1805	2785	3540	4170	5790	5790	5790

(8) For Multi-Speed motors, multiply the adder by 1.5.

E. Calibration Test, Un-Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1442	1442	1442	1442	1442	1442	2082	2622	3042	4120	4120	4120

(8) For Multi-Speed motors, multiply the adder by 1.5. A Calibration Test is the same as a Complete Initial Test, except curves are provided to the customer.

F. Calibration Test, Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	2070	2070	2070	2070	2070	2070	3050	3800	4435	6050	6050	6050

(8) For Multi-Speed motors, multiply the adder by 1.5. A Calibration Test is the same as a Complete Initial Test, except curves are provided to the customer.

G. No Load Bearing Heat Run Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	1690	1935	1935	1960	1960	1960

H. IEEE 841[™] Enhanced No Load Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	900	900	900	900	900	900	900	900	900	900	900

[†] All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

50. Tests (List Pricing) *(continued)*

I. IEEE 841™ Enhanced No Load Test, Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	1350	1350	1350	1350	1350	1800	1800	1800	2700	2700	2700

J. No Load Saturation Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210

K. Polarization Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1135	1135	1135	1135	1135	1590	1590	1815	1815	1835	1835	1835

L. Polarization Test, Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1700	1700	1700	1700	1700	2380	2380	2720	2720	2755	2755	2755

M. Rotor Integrity Test (Growler Test), Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1170	1170	1170	1170	1170	1640	1640	1875	1875	1900	1900	1900

N. Shaft Voltage Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025

O. Sound Test, Un-Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025

(8) For Multi-Speed motors, multiply the adder by 1.5.

P. Sound Test, Witnessed (8)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1875	1875	1875	1875	1875	2625	2625	3000	3000	3040	3040	3040

(8) For Multi-Speed motors, multiply the adder by 1.5.

Q. Vibration Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	700	700	700	700	700	700	700	700	700	700	700	700

R. Vibration Test, Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

S. Standard Nidec Motor Corporation Surge Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	200	200	200	200	200	200	200	200	200	200	200	200

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA®† Horizontal Motors Accessories and Modifications

50. Tests (List Pricing) (continued)

T. Standard Nidec Motor Corporation Bearing Insulation Test, Un-Witnessed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	1250	1250	1250	1250	1250	1750	1750	2000	2000	2025	2025	2025

51. Thermal Protection

Selection of an accessory designed to provide thermal protection of bearings or windings depends upon the desired function the device is to perform.

• TYPE OF PROTECTION PROVIDED

A. Locked Rotor

This type of protection is only available for random wound motors and is dependent on two variables.

1) The response time of the circuits beyond our detectors (or in the case of THERMA SENTRY®, beyond our controller), and 2) The particular motor design.

B. Running Overload (thermal considerations only)

C. Abnormally High Ambient

D. Voltage Unbalance

E. High or Low Voltage

F. Ventilation Failure

G. Single Phasing

H. Starting Overload

I. Alarm or Shutdown to Prevent Catastrophic Failure

Thermowells are not an available option on NEMA® motors. Thermowells are specifically designed to protect probes from pressure, flow and corrosion when the probe is submerged in this environment. None of these conditions exist in their application to NEMA® motors.

Bearing Thermal Protection

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. Adder is per accessory. Only available on 360 to 440 Frame Enclosed motors. Same size bearings on both ends must also be chosen as an option. The following options are available (refer to "Thermal Protection, Windings" for a detailed description of each type of protection):

- Arrange to Accommodate BDTs (must specify details at order entry)
- Thermocouples, Chromel (Type E)
- Thermocouples Chromel Alumel (Type K)
- RTD, 120 Ohm, 2 Lead
- RTD, 100 Ohm, 3 Lead
- RTD, 100 Ohm Dual Element, 3 Lead
- Thermocouples, Copper (Type T)
- Thermocouples, Iron (Type J)
- RTD, 10 Ohm, 3 Lead
- RTD, 120 Ohm, 3 Lead
- RTD, 100 Ohm Precision, 3 Lead
- RTD, 100 Ohm Precision Dual Element, 3 Lead

Winding Thermal Protection

A. Winding Thermostats

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	80	80	80	95	95	120	170	255	255	255	255	255

On self certified Division 2 motors, apply the Hermetically Sealed Thermostat Adder. Thermostats: Snap action, bi-metallic, temperature actuated switches installed in the connection end-turns of the motor winding. Their purpose is to activate a warning device or shut down the motor upon excessive winding temperatures. Standard arrangement is Q-1 per phase. On low voltage motors (600V and below), the thermostat leads are brought out to the main conduit box unless an accessory conduit box is specified.

The following options are available:

- Thermostats, Normally Closed (Q-1 per phase)
- Thermostats, Normally Open (Q-1 per phase)

Normally Closed Thermostats are supplied as standard (no charge) on the following motors:

- Inverter Duty motors (Normally Open Thermostats also available at no charge on Inverter Duty if specified at time of order).
- Hazardous Location motors as follows:
 - Temperature Codes T2C through T6, All NEMA®† Frame sizes
 - Division 1, Class II motors - Motors with Class H Insulation
 - Motors with Abrasion Resistant Insulation System
 - Temperature Codes T1 through T2B, 444-449 Frames
 - Class I Group T2A or T2B with VPI-1000 or VPI-2000

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

51. Thermal Protection (continued)

B. Winding Thermostats, Hermetically Sealed

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	435	435	435	435	435	715	1020	1530	1530	1530	1530	1530

Hermetically sealed, snap action, bimetallic, temperature actuated switches installed in the connection end-turns of the motor winding. Their purpose is to activate a warning device (N.O.) or shut down the motor (N.C.) upon excessive winding temperatures. Leads are normally brought out to the main conduit box on 460 volt motors. They are available with normally closed contacts for automatic reset. Overheat protectors with normally open contacts, for use in alarm or warning circuits, are available when specified at time of order. Standard arrangement is Q-1 per phase.

C. Winding Thermistors (Embedded In Winding)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	390	390	390	390	390	555	555	725	725	725	725	725

Winding thermistors are a nonlinear resistance temperature detector made of semiconductor material and embedded in the end turns of the motor winding, one per phase. Nidec Motor Corporation offers only SIEMENS[®] PTC type (Positive Temperature Coefficient) thermistors. NTC type thermistors are not available.

- This accessory will not work without a control module. Our standard thermistors are SIEMENS[®] type B59155. Three thermistors are installed in the winding with 6 leads brought to the main conduit box. With this adder, the control module is supplied by others, not Nidec Motor Corporation.
- To prevent nuisance tripping when this accessory is applied to reduced voltage starters, a timer in the control circuit should be added in the control circuit and set for 1-2 seconds. This will allow the motor to start when the auto signal is received (see diagram under THERMA SENTRY[®] description).
- This accessory provides NEMA[®] Type 2 (winding - running over temperature) protection.
- Thermistors are embedded in the winding end turns during manufacturing and cannot be easily added through conversion.

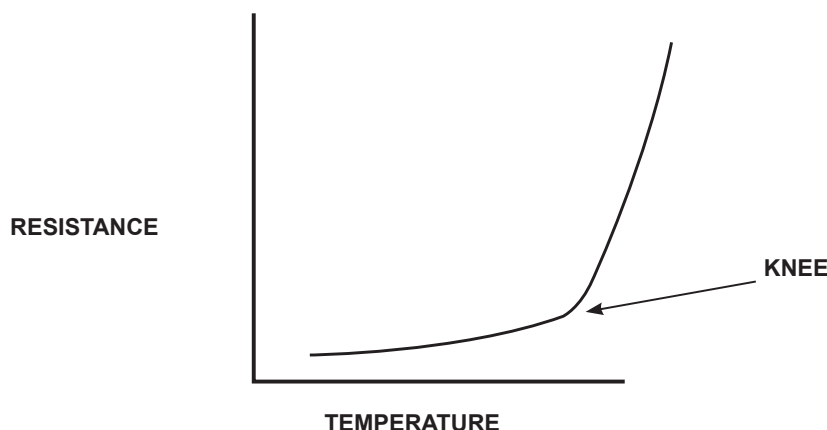
D. THERMA SENTRY[®] System (Separately Mounted / Separately Excited)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045

- Refer to notes listed under thermistors above (Note: THERMA SENTRY[®] includes control module).

THERMA SENTRY[®] Mode of Operation

The temperature sensor in the THERMA SENTRY[®] is a PTC thermistor. Its resistance increases non-linearly with temperature. When the motor winding reaches the critical shutdown point (knee of curve), there is a sharp rise in resistance.



The THERMA SENTRY[®] winding protection consists of three Positive Temperature Coefficient (PTC) thermistors, one per phase, embedded in the end turns with six leads brought to the motor conduit box and a control for remote mounting by the customer. It protects against the most common causes of motor failure, including: high or low supply voltage, unbalanced line voltage, single phase conditions, abnormally high ambient temperatures, blocked ventilation, starting overload, and running overloads. The solid state control module is supplied with one normally open and normally closed contact (N/C). The control module must be separately excited by a 24 to 240 AC/DC voltage source. The THERMA SENTRY[®] control module on this option is remote mounted in the customer's control panel.

[†] All marks shown within this document are properties of their respective owners.

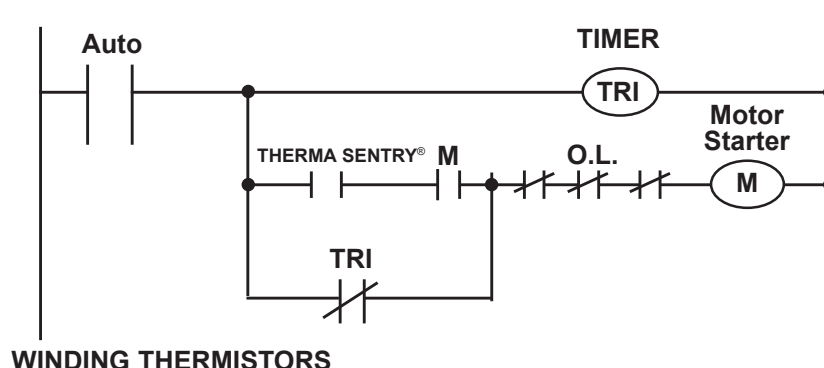


Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

51. Thermal Protection *(continued)*

- Time-out circuit for THERMA SENTRY[®] used with reduced voltage starting.

There are many possible ways to provide a time-out scheme to the starting circuit. One simple, inexpensive option is shown below:



E. THERMA SENTRY[®] System (Motor Mounted / Separately Excited)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1825	1825	1825	1825

- Refer to notes listed under thermistors above (Note: THERMA SENTRY[®] includes control module). Not available on Hazardous Location Motors or Division 2 motors.
- The THERMA SENTRY[®] control module on this option is motor mounted. Other winding accessory leads, with exception to stator RTD leads, can be directed to the THERMA SENTRY[®] accessory conduit box.

F. Winding Thermocouples

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	2160	2160	2160	2160	2160	2160	2160	2160	2160

Double adder for Hazardous Location motors. Thermocouples: A pair of dissimilar conductors so joined at one point that an electromotive force is developed by the thermoelectric effects.

- Available on 210 Frame and larger.
- Standard arrangement is Q-2 per phase.
- Nidec Motor Corporation does not furnish the monitor.
- Thermocouple leads are routed to an accessory conduit box (included in the price adder) on 280 Frame (Cast Iron Frame motors only) and on all 320 Frame and larger.

The following options are available:

- Thermocouples, Copper Constantan (Type T), 2/Phase
- Thermocouples, Chromel Constantan (Type E), 2/Phase
- Thermocouples, Iron Constantan (Type J), 2 Phase

Winding Resistance Temperature Detectors (RTDs)

An RTD is a sensing element consisting of a precision wound wire coil of pure metal. Recognized for their accuracy, the RTD's resistance increases with temperature rise in a known and highly repeatable manner. When connected to an input instrument or monitor, RTD temperature can be monitored. A variety of RTDs are offered to industry standard curves as shown below. Must be specified at time of order entry.

RTD Element	No. of Wires	Resistance
Nickel (1)	2	120 Ohm @ 0°C
Copper	3	10 Ohm @ 25°C
Platinum	3	100 Ohm @ 0°C
Precision Platinum	3	100 Ohm @ 0°C

- (1) Nidec Motor Corporation standard supply, if not specified at time of order entry.

Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

51. Thermal Protection *(continued)*

G. Winding RTDs (2/Phase)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. Adder is per accessory. Only available on 360 to 440 Frame Enclosed motors. Double adder for Hazardous Location motors. Resistance Temperature Detectors (RTDs) are precision, wire-wound resistors with a known temperature-resistance characteristic.

The RTDs are installed in the slot portion of the motor.

- Standard arrangement is Q-2 per phase (can only provide Q-1 per phase on NEMA^{®†} Frame Hazardous Location motors)
- Nidec Motor Corporation does not furnish the monitor.
- RTD leads are routed to an accessory conduit box (included in the adder).

The following options are available:

- 10 Ohm, 3 Lead, 2/Phase
- 120 Ohm, 2 Lead, 2/Phase
- 120 Ohm, 3 Lead, 2/Phase
- 100 Ohm, 3 Lead, 2/Phase
- 100 Ohm Precision, 3 Lead, 2/Phase
- 10 Ohm, 3 Lead, 1/Phase
- 120 Ohm, 2 Lead, 1/Phase
- 120 Ohm, 3 Lead, 1/Phase
- 100 Ohm, 3 Lead, 1/Phase
- 10, 120 or 100 Ohm, 3 Lead, 3/Phase

RTDs are available on the following:

- 280 Frame, Cast Iron motors only
- 320 Frame and larger motors

52. Torque

Special Locked Rotor or Breakdown Torque

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Adder is percent of Base List Price. Use this Special Torque adder for higher than standard Locked Rotor Torque or Breakdown Torque, or for Design "C" characteristics. (Design "C" not available on all ratings - refer to office.) High Torque is included as standard (no charge) with Crusher Duty.

53. Vibration Detectors

(QP) Refer to Quick Pick Chart For Pricing

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing and available options. Nidec Motor Corporation's standard offering is Robertshaw^{®†} Model 366 (for Non-Hazardous Location motors) and Metrix^{®†} Model 5550 (for Hazardous Location motors). If the "Arrange to Accommodate" option is selected, the manufacturer, manufacturer's part number and type must be specified at order entry. Available on 320 Frame and larger. Limited availability on 320 and 360 Frames.

54. Voltage, Standard And Special

A. Special (<345 Volts)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	39	39	39	87	120	144	347	510	798	1125	1463	1463

B. Special (>345 Volts)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	39	39	39	87	120	144	173	255	399	663	698	698

Motors will operate successfully, but not necessarily in accordance with all NEMA^{®†} (MG-1) performance standards, at voltages 10% above or below nameplate stamping at maintained

Hertz	Horsepower	Standard Voltages
60 Hz	Thru 30 HP	200, 208, 230, 230/460, 460, 575
60 Hz	40-100 HP	200, 208, 230, 230/460, 460, 575
60 Hz	> 100 HP	460, 575
50 Hz	Thru 100 HP	190, 190/380, 200/400, 220, 220/380, 208/415, 380, 400, 415
50 Hz	> 100 HP	380, 400, 415

† All marks shown within this document are properties of their respective owners.



Three Phase Modifiable NEMA[†] Horizontal Motors

Accessories and Modifications

55. Warranty, Special

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. Adder is a percent of Net Motor Price. All Nidec Motor Corporation[®] products carry the limited warranty set forth in Section 5 of Nidec Motor Corporation's Standard Terms and Conditions of Sale contained on page viii. Optional Extended Warranty periods (Deferred, Extended and Special Warranties) are available, but must be approved prior to quoting. Refer to the General Sales Policy (PB904) for complete information on the customer's responsibilities when applying optional limited warranties.

56. Washdown Duty Features

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

(6) Washdown Duty motors are available in frame sizes 56-215. For larger sizes, motors with the following Washdown features can be provided:

- CORRO-DUTY[®]
- Double Sealed Bearings
- 303 Stainless Steel shaft
- White Epoxy Paint
- Lip Seals on Both Ends
- Washdown Duty Grease
- Internal Moistureproof Sealer (56-250 Frame)

For pricing, add for each of the above features.

57. Zero Speed Switch

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4425	4425	4425

A digital speed switch for precision rotation monitoring over a full range of speeds from 0.5-5000 RPM. Rated single phase, 115 Volts with a relay contact of 5A. Standard offering is Single Pole, Double Throw (SPDT) with Weatherproof Connection Head.

Options available:

- Double Pole, Double Throw (DPDT)
- Available on 440 Frames.
- Hazardous Location Connection Head



ACCU-Torq^{®†} Motor Accessories and Available Conversions

NOTE:

- Pre-assembled encoder, brake and shaft grounding options on ACCU-Torq[®] motors – NO EXTRA ASSEMBLY CHARGE.
- Conversion parts discount symbol is the same as the parent item.

CONVERSION OPTIONS:

- Brakes and encoders are compatible with ACCU-Torq[®] motor ratings per the below tables.
- F2 mounting for 180 frame and larger (F1 standard).

Encoders

- All encoders listed have Line-Driver Outputs and 1024 PPR
- Encoder cables not supplied by Nidec Motor Corporation[®]

						LIST PRICE BY FRAME, SPEED RANGE, AND ENCLOSURE TYPE				
MAKE	MODEL	BRGS	SENSOR	DUTY	CONNECTOR	56-256 5000:1 CT TENV	182-256 20:1 CT TENV	182-256 20:1 CT TEFC	182-447 20:1 CT TEFC	254-449 5000:1 CT TEBC
AVTRON	AV56*	NO	MAGNETIC	HEAVY, BRAKE	10-PIN INDUSTRIAL	\$1,600	\$1,600	-	-	\$1,600
DYNAPAR	ST56*	NO	MAGNETIC	HEAVY, BRAKE	10-PIN INDUSTRIAL	\$2,410	\$2,410	-	-	\$2,410
AVTRON	AV32	NO	MAGNETIC	MILL	MS 10-PIN	\$1,125	\$1,125	\$1,125	\$1,125	\$1,125
AVTRON	HS25A	YES	OPTICAL	LIGHT	MS 10-PIN	\$1,125	\$1,125	\$1,125	-	-
DYNAPAR	HS20	YES	OPTICAL	LIGHT	MS 10-PIN	\$1,200	\$1,200	\$1,200	-	-
EPC	260	YES	OPTICAL	LIGHT	MS 10-PIN	\$1,125	\$1,125	\$1,125	-	-
AVTRON	HS35A	YES	OPTICAL	LIGHT	MS 10-PIN	-	-	\$1,300	\$1,300	\$1,300
DYNAPAR	HS35R	YES	OPTICAL	LIGHT	MS 10-PIN	-	-	\$1,530	\$1,530	\$1,530
EPC	25T	YES	OPTICAL	MILL	MS 10-PIN	-	-	\$1,300	\$1,300	\$1,300

* Required for brake mounting with encoder (TENV)



HS20 Encoder



HS25A Encoder



ST56 Encoder



260 Encoder



AV32 Encoder

Brakes

- Connections to brakes: flying leads in brake enclosure
- Brakes rated for holding only – not to be applied for stopping.
- Universal mount – for vertical and horizontal mounted motors

ENCL.	FRAME	MAKE	SERIES	LIST	COIL VOLTS	NOM STATIC TORQUE	ENCLOSURE
TENV	56-256	Stearns [®]	56,000	\$766	115/208-230	6 lb-ft	IP23, STEEL HOUSING
		Stearns [®]	56,000	\$911	115/208-230	10 lb-ft	IP23, STEEL HOUSING
		Stearns [®]	56,000	\$766	208-230/460	6 lb-ft	IP23, STEEL HOUSING
		Stearns [®]	56,000	\$911	208-230/460	10 lb-ft	IP23, STEEL HOUSING
		Stearns [®]	56,000	\$766	575	6 lb-ft	IP23, STEEL HOUSING
		Stearns [®]	56,000	\$911	575	10 lb-ft	IP23, STEEL HOUSING



ACCU-Torq[™]
Motor & Brake
Configuration



ACCU-Torq[™]
Motor & Encoder
Configuration



ACCU-Torq[™]
Motor, Encoder &
Brake Configuration

Shaft Grounding Ring

- Reduces potential bearings failures caused by induced shaft currents

Make	List
Shaft Grounding Ring	\$175

Nominal Full Load Efficiencies of Premium Efficient 60Hz $\leq 600V$ Motors

Open Motors				
HP	2 Pole	4 Pole	6 Pole	8 Pole
1	77.0	85.5	82.5	75.5
1.5	84.0	86.5	86.5	77.0
2	85.5	86.5	87.5	86.5
3	85.5	89.5	88.5	87.5
5	86.5	89.5	89.5	88.5
7.5	88.5	91.0	90.2	89.5
10	89.5	91.7	91.7	90.2
15	90.2	93.0	91.7	90.2
20	91.0	93.0	92.4	91.0
25	91.7	93.6	93.0	91.0
30	91.7	94.1	93.6	91.7
40	92.4	94.1	94.1	91.7
50	93.0	94.5	94.1	92.4
60	93.6	95.0	94.5	93.0
75	93.6	95.0	94.5	94.1
100	93.6	95.4	95.0	94.1
125	94.1	95.4	95.0	94.1
150	94.1	95.8	95.4	94.1
200	95.0	95.8	95.4	94.1
250	95.0	95.8	95.8	95.0
300	95.4	95.8	95.8	-
350	95.4	95.8	95.8	-
400	95.8	95.8	-	-

Enclosed Motors				
HP	2 Pole	4 Pole	6 Pole	8 Pole
1	77.0	85.5	82.5	75.5
1.5	84.0	86.5	87.5	78.5
2	85.5	86.5	88.5	84.0
3	86.5	89.5	89.5	85.5
5	88.5	89.5	89.5	86.5
7.5	89.5	91.7	91.0	86.5
10	90.2	91.7	91.0	89.5
15	91.0	92.4	91.7	89.5
20	91.0	93.0	91.7	90.2
25	91.7	93.6	93.0	90.2
30	91.7	93.6	93.0	91.7
40	92.4	94.1	94.1	91.7
50	93.0	94.5	94.1	92.4
60	93.6	95.0	94.5	92.4
75	93.6	95.4	94.5	93.6
100	94.1	95.4	95.0	93.6
125	95.0	95.4	95.0	94.1
150	95.0	95.8	95.8	94.1
200	95.4	96.2	95.8	94.5
250	95.8	96.2	95.8	95.0
300	95.8	96.2	95.8	-
350	95.8	96.2	95.8	-
400	95.8	96.2	-	-

Nominal Full Load Efficiencies of Energy Efficient 60Hz <=600V Motors

Open Motors				
HP	2 Pole	4 Pole	6 Pole	8 Pole
1	-	82.5	80.0	74.0
1.5	82.5	84.0	84.0	75.5
2	84.0	84.0	85.5	85.5
3	84.0	86.5	86.5	86.5
5	85.5	87.5	87.5	87.5
7.5	87.5	88.5	88.5	88.5
10	88.5	89.5	90.2	89.5
15	89.5	91.0	90.2	89.5
20	90.2	91.0	91.0	90.2
25	91.0	91.7	91.7	90.2
30	91.0	92.4	92.4	91.0
40	91.7	93.0	93.0	91.0
50	92.4	93.0	93.0	91.7
60	93.0	93.6	93.6	92.4
75	93.0	94.1	93.6	93.6
100	93.0	94.1	94.1	93.6
125	93.6	94.5	94.1	93.6
150	93.6	95.0	94.5	93.6
200	94.5	95.0	94.5	93.6
250	94.5	95.4	95.4	94.5
300	95.0	95.4	95.4	-
350	95.0	95.4	95.4	-
400	95.4	95.4	-	-

Enclosed Motors				
HP	2 Pole	4 Pole	6 Pole	8 Pole
1.0	75.5	82.5	80.0	74.0
1.5	82.5	84.0	85.5	77.0
2.0	84.0	84.0	86.5	82.5
3.0	85.5	87.5	87.5	84.0
5.0	87.5	87.5	87.5	85.5
7.5	88.5	89.5	89.5	85.5
10.0	89.5	89.5	89.5	88.5
15.0	90.2	91.0	90.2	88.5
20.0	90.2	91.0	90.2	89.5
25.0	91.0	92.4	91.7	89.5
30.0	91.0	92.4	91.7	91.0
40.0	91.7	93.0	93.0	91.0
50.0	92.4	93.0	93.0	91.7
60.0	93.0	93.6	93.6	91.7
75.0	93.0	94.1	93.6	93.0
100.0	93.6	94.5	94.1	93.0
125.0	94.5	94.5	94.1	93.6
150.0	94.5	95.0	95.0	93.6
200.0	95.0	95.0	95.0	94.1
250.0	95.4	95.0	95.0	94.5
300.0	95.4	95.4	95.0	-
350.0	95.4	95.4	95.0	-
400.0	95.4	95.4	-	-

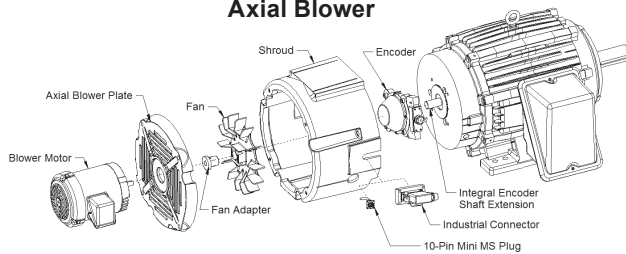
Special Application, Vector Duty Blower (ACCU-Series)

AXIAL BLOWER SPARE PARTS								RADIAL BLOWER SPARE PARTS						
Motor Frame Size	Blower Motor HP	Blower Motor RPM	Blower Motor Frame	Blower Motor FLA	Blower Motor Catalog Number	Spare Motor Price	Discount Symbol	Blower Motor HP	Blower Motor RPM	Blower Motor Frame	Blower Motor FLA	Blower Motor Catalog Number	Spare Motor Price	Discount Symbol
215TC	1/3	1800	42CZ	1.5/0.75	T13S2D42ZCR	\$266	DS-3RST	1/3	3600	56C	1.8/0.9	T13S1ACR	\$279	DS-3RST
254TC	1/3	1800	42CZ	1.5/0.75	T13S2D42ZCR	\$266	DS-3RST	1/3	3600	56C	1.8/0.9	T13S1ACR	\$279	DS-3RST
256TC	1/3	1800	42CZ	1.5/0.75	T13S2D42ZCR	\$266	DS-3RST	1/3	3600	56C	1.8/0.9	T13S1ACR	\$279	DS-3RST
284T	1/2	1800	56C	1.7/0.9	U12S2ACR	\$291	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
286T	1/2	1800	56C	1.7/0.9	U12S2ACR	\$291	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
324T	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
326T	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
364T	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
365T	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST	1 1/2	3600	56C	5.0/2.5	T32P1ACR	\$485	DS-3RST
405T	2	1800	145TC	5.7/2.8	U2P2DCR	\$578	DS-3RST	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
444T	2	1800	145TC	5.7/2.8	U2P2DCR	\$578	DS-3RST	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
445T	2	1800	145TC	5.7/2.8	U2P2DCR	\$578	DS-3RST	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
447T	2	1800	145TC	5.7/2.8	U2P2DCR	\$578	DS-3RST	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
449T	3	1800	182TCH	7.8/3.9	U3P2DKR	\$742	DS-3AL	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
449T	3	1800	182TCH	7.8/3.9	U3P2DKR	\$742	DS-3AL	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST
449T	3	1800	182TCH	7.8/3.9	U3P2DKR	\$742	DS-3AL	1	1800	56C	3/1.5	U1P2DFCR	\$425	DS-3RST

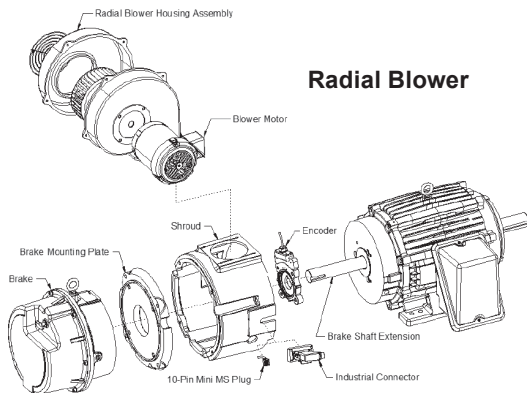
Encoders: Table by availability and list price on page 121.

Brakes: Table by nominal static torque, enclosure and list price on page 121.

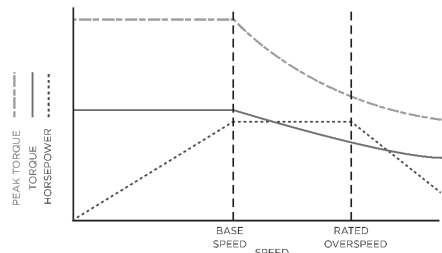
Axial Blower



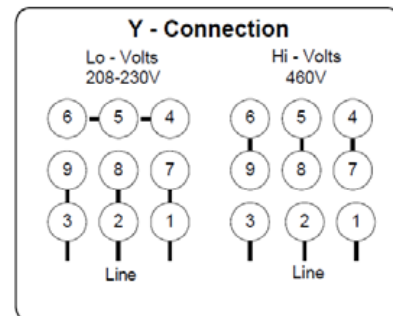
Radial Blower



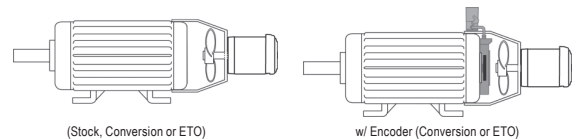
Constant Torque and Horsepower Curves



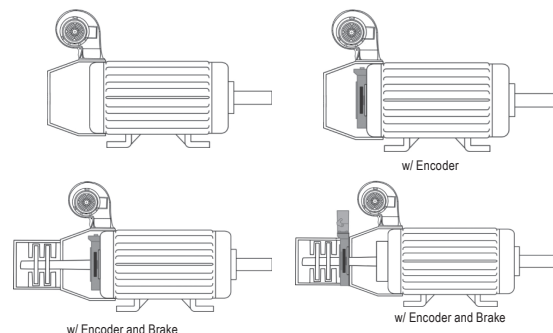
3-Phase Blower Connection Data



Axial Blower Configurations:



Radial Blower Configurations: (All ETO Only)



† All marks shown within this document are properties of their respective owners.

LOAD INERTIA TABLES, SQUIRREL-CAGE INDUCTION MOTORS

Refer to the "High Inertia Load" option

Load WK2 (Exclusive of Motor WK2), Lb-Ft2

HP	Synchronous Speed RPM @ 60 Hertz						
	3600	1800	1200	900	720	600	514
1	1.2	5.8	15	31	53	82	118
1.5	1.8	8.6	23	45	77	120	174
2	2.4	11	30	60	102	158	228
3	3.5	17	44	87	149	231	335
5	5.7	27	71	142	242	375	544
7.5	8.3	39	104	208	356	551	798
10	11	51	137	273	467	723	1048
15	16	75	200	400	685	1061	1538
20	21	99	262	525	898	1393	2018
25	26	122	324	647	1108	1719	2491
30	31	144	384	769	1316	2042	2959
40	40	189	503	1007	1725	2677	3881
50	49	232	620	1241	2127	3302	4788
60	58	275	735	1473	2524	3919	5680
75	71	338	904	1814	3111	4831	7010
100	92	441	1181	2372	4070	6320	9180
125	113	542	1452	2919	5010	7790	11310
150	133	640	1719	3456	5940	9230	13410
200	172	831	2238	4508	7750	12060	17530
250	210	1017	2744	5540	9530	14830	21560
300	246	1197	3239	6540	11270	17550	25530
350	281	1373	3723	7530	12980	20230	29430
400	315	1546	4199	8500	14670	22870	33280

HP	Synchronous Speed RPM @ 50 Hertz						
	3000	1500	1000	750	600	500	430
1	1.9	9.0	24	48	82	126	183
1.5	2.8	13	35	70	120	186	269
2	3.7	17	46	92	158	244	353
3	5.4	26	68	135	231	358	519
5	8.8	41	110	220	375	582	842
7.5	13	61	161	322	551	854	1237
10	17	80	212	423	723	1121	1624
15	25	117	310	620	1061	1646	2384
20	32	153	407	814	1393	2160	3129
25	40	189	502	1004	1719	2666	3864
30	47	224	596	1193	2041	3167	4589
40	62	293	781	1563	2677	4153	6020
50	76	361	963	1928	3302	5124	7429
60	90	428	1142	2287	3919	6083	8820
75	111	527	1406	2818	4831	7501	10879
100	144	687	1838	3687	6324	9823	14252
125	177	844	2261	4540	7790	12105	17566
150	208	998	2676	5378	9233	14352	20833
200	270	1298	3489	7021	12064	18764	27250
250	329	1590	4282	8626	14834	23086	33541
300	387	1874	5058	10200	17554	27333	39728
350	443	2152	5819	11748	20231	31517	45826
400	497	2425	6567	13272	22870	35644	51846





STANDARD LOCKED ROTOR & BREAKDOWN TORQUE

For pricing purposes, refer to the "Torque High" Option

HP	Standard Locked Rotor Torque (% of Full Load Torque)						
	3600	1800	1200	900	720	600	514
1	-	275	170	135	135	115	110
1.5	175	250	165	130	130	115	110
2	170	235	165	130	125	115	110
3	160	215	155	130	125	115	110
5	150	185	150	130	125	115	110
7.5	140	175	150	125	120	115	110
10	135	165	150	125	120	115	110
15	130	160	140	125	120	115	110
20	130	150	135	125	120	115	110
25	130	150	135	125	120	115	110
30	130	150	135	125	120	115	110
40	125	140	135	125	120	115	110
50	120	140	135	125	120	115	110
60	120	140	135	125	120	115	110
75	105	140	135	125	120	115	110
100	105	125	125	125	120	115	110
125	100	110	125	120	115	115	110
150	100	110	120	120	115	115	60
200	100	100	120	120	115	60	60
250	70	80	100	100	60	60	60
300	70	80	100	60	60	60	60
350	70	80	100	60	60	60	60
400	70	80	60	60	60	60	60

HP	Standard Breakdown Torque (% of Full Load Torque)						
	3600	1800	1200	900	720	600	514
1	-	300	265	215	200	200	200
1.5	250	280	250	210	200	200	200
2	240	270	240	210	200	200	200
3	230	250	230	205	200	200	200
5	215	225	215	205	200	200	200
7.5	200	215	200	200	200	200	200
10	200	200	200	200	200	200	200
15	200	200	200	200	200	200	200
20	200	200	200	200	200	200	200
25	200	200	200	200	200	200	200
30	200	200	200	200	200	200	200
40	200	200	200	200	200	200	200
50	200	200	200	200	200	200	200
60	200	200	200	200	200	200	200
75	200	200	200	200	200	200	200
100	200	200	200	200	200	200	200
125	200	200	200	200	200	200	200
150	200	200	200	200	200	200	175
200	200	200	200	200	200	175	175
250	175	175	175	175	175	175	175
300	175	175	175	175	175	175	175
350	175	175	175	175	175	175	175
400	175	175	175	175	175	175	175

† All marks shown within this document are properties of their respective owners.



Hazardous Location

For pumps, fans, compressors, blowers, conveyors and general industrial equipment in hazardous locations as defined by class and group.

Horsepower: 1/4 through 200 HP,
Single and Dual Label

Phase: Single and Three Phase

RPM: 1200, 1800 and 3600

Voltage: 115/208 - 230, 115/230,
230/460, 208-230/460 and 460

Efficiency: Premium, Energy and
Standard Efficient

Mounting: Footed, Footless C-Face

Agency: UL^{®†} Recognized and
CSA^{®†} Certified

[†] All marks shown within this document are properties
of their respective owners.



Hazardous Location Specifications

Certain locations may be classified as hazardous because the atmosphere may contain gas, vapor or dust in explosive quantities. The National Electrical Code (NEC^{®†}) divides these locations into Classes and Groups according to the type of explosive agent which may be present. Examples of these agents are shown below. For a complete list, see NFPA (National Fire Protection Association) publication 487M.

Underwriters' Laboratories (UL^{®†}) tests motors and other devices for use in explosive atmospheres and publishes a list of those meeting its standards for each Class and Group. Use of UL^{®†} listed devices does not necessarily make an installation conform to the NEC^{®†} or local codes. Consult Chapter 5 of the NEC^{®†}, local building codes, OSHA requirements and insurance inspectors for detailed data as to proper procedures.

Class I - Flammable Gases or Vapors: Gases and vapors are grouped by severity of expected explosion pressure and extent of flame propagation between parts. For Class I applications, Nidec Motor Corp. offers hazardous location products for:

- Group C - ethyl-ether, ethylene and propane
- Group D - gasoline, hexane, naphtha, benzene, butane, propane, alcohol, lacquer solvent vapors and natural gas

Class II - Combustible Dusts: Dusts are grouped by combustibility, penetrability between parts, blanketing effect, ignition temperature and ability to contribute to creation of an ignition source through abrasiveness or electrical conductivity. For Class II applications, Nidec Motor Corp. offers hazardous location products for:

- Group E - aluminum, magnesium similar metal dusts
- Group F - carbon black, coal or coke
- Group G - flour, starch or grain

Temperature: In addition to the identification of the class, group and division, it is necessary to obtain the temperature code or maximum surface temperature for the hazardous location motor. This code or temperature indicates the maximum surface temperature for all conditions, including burnout, overload, single phasing and locked rotor. The maximum surface temperature, or "T" code, must be identified on the nameplate.

All hazardous location motors have a temperature code that defines the maximum allowable frame temperature. These codes are as follows:

Temperature Identification Numbers		
Maximum Temperature (For All Conditions)		T-Code
Celsius	Fahrenheit	
280*	536	T2A***
260*	500	T2B***
230*	446	T2C***
215*	419	T2D***
200*	392	T3
180*	356	T3A
165*	329	T3B
160*	320	T3C
135*	275	T4
120*	248	T4A
100*	212	T5

*Class I, Group D only, requires caution statement

**Requires thermostats

***Not allowable for use with Class II locations

[†] All marks shown within this document are properties of their respective owners.



Encoder Selection Chart

LIGHT MILL DUTY – For use in dry commercial and industrial environments with temperature controlled spaces.

MILL DUTY – For use in typical industrial environments. More mechanically robust than light mill duty. Not recommended for environments with frequent temperature changes and chronically wet conditions.

HEAVY MILL DUTY – For more rugged environments with frequent temperature fluctuations and increased levels of contaminations and moisture.

SEVERE DUTY – For use in very wet or dusty environments with large and frequent temperature extremes including outdoor applications.

OPTICAL sensors are offered in light and mill duty encoders. Optical sensing technology works best when used in environments without frequent temperature changes and/or chronically wet conditions.


MAGNETIC sensors are offered in light, mill, heavy and severe duty encoders. Because they are not affected by dust or moisture, they are suited to rough service in modular style encoders.

Recommended Type	Typical Applications*								
	Conveying	Converting	Films	Food	Paper	Steel	Hoist	Marine	Oil Drilling
Light									
Standard/Mill									
Heavy					S			S	E
Severe					S			S	E

* Darker=better suited for application
^SStainless Option Recommended
^EExplosion Protected Recommended

* Nidec Motor Corporation makes no warranty as to suitability of purpose; recommendations are based on industry standard applications and are subject to warranty terms and conditions of sale.

See the quick pick chart on page 60 for more details of the encoders below:

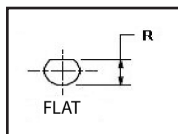
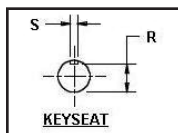
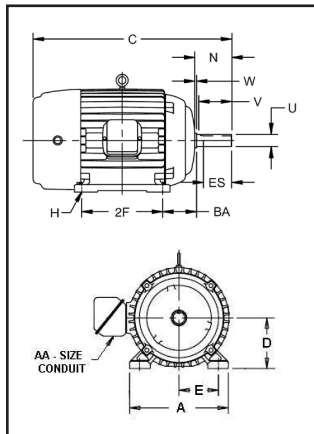
 Heavier Duty	TYPE OF ENCODER	MOUNTING	MODEL
	Optical Commercial Duty	Hollow Shaft	Dynapar [†] HS20R
			Encoder Products Co. [†] 260
	Optical Light Duty	Hollow Shaft	AVTRON [†] HS25A
			Avtron [†] HS35A
			Dynapar [†] HS35R
			Encoder Products Co. [†] 775
			Encoder Products Co. [†] 776
	Optical Mill Duty	Hollow Shaft	Encoder Products Co. [†] 25T
			Encoder Products Co. [†] 770
			Encoder Products Co. [†] 771
	Magnetic Mill Duty	No Bearing	Avtron [†] AV32
		Hollow Shaft	Avtron [†] HS35M
	Magnetic Heavy Duty	Hollow Shaft	Avtron [†] HS45
		Modular C-Face	Dynapar [†] ST56
			Avtron [†] AV56A
			Avtron AV850
	Magnetic Severe Duty	Hollow Shaft	Avtron [†] AV685
		Solid Shaft	Avtron [†] AV485

[†] All marks shown within this document are properties of their respective owners.



NEMA^{®†} Dimension Guide

Dimensions for AC Foot-Mounted Motors with Single Straight-Shaft Extension



Frame	A Max	D	E	2F	BA	H	U	N-W	V Min.	R	Keyseat ES Min.	S	AA Min.
42	—	2.62	1.75	1.69	2.06	0.28 slot	0.375	1.12	—	0.328	—	flat	—
48	—	3.00	2.12	2.75	2.50	0.34 slot	0.500	1.50	—	0.453	—	flat	—
48H	—	—	—	4.75	—	—	—	—	—	—	—	—	—
56	—	3.50	2.44	3.00	2.75	0.34 slot	0.625	1.88	—	0.517	1.41	0.188	—
56H	—	—	—	5.00	—	—	—	—	—	—	—	—	—
143T	7.00	3.50	2.75	4.00	2.25	0.34 hole	0.875	2.25	2.00	0.771	1.41	0.188	3/4
145T	—	—	—	5.00	—	—	—	—	—	—	—	—	—
182	9.00	4.50	3.75	4.50	2.75	0.41 hole	0.875	2.25	2.00	0.771	1.41	0.188	3/4
184	—	—	—	5.50	—	—	—	—	—	—	—	—	—
182T	—	—	—	4.50	—	—	1.125	2.75	2.50	0.986	1.78	0.250	—
184T	—	—	—	5.50	—	—	—	—	—	—	—	—	—
213	10.50	5.25	4.25	5.50	3.50	0.41 hole	1.125	3.00	2.75	0.986	2.03	0.250	3/4
215	—	—	—	7.00	—	—	—	—	—	—	—	—	—
213T	—	—	—	5.50	—	—	1.375	3.38	3.12	1.201	2.41	0.312	1
215T	—	—	—	7.00	—	—	—	—	—	—	—	—	—
254U	12.50	6.25	5.00	8.25	4.25	0.53 hole	1.375	3.75	3.50	1.201	2.78	0.312	1
256U	—	—	—	10.00	—	—	—	—	—	—	—	—	—
254T	—	—	—	8.25	—	—	1.625	4.00	3.75	1.416	2.91	0.375	1-1/4
256T	—	—	—	10.00	—	—	—	—	—	—	—	—	—
284U	14.00	7.00	5.50	9.50	4.75	0.53 hole	1.625	4.88	4.63	1.416	3.78	0.375	1-1/4
286U	—	—	—	11.00	—	—	—	—	—	—	—	—	—
284T	—	—	—	9.50	—	—	1.875	4.62	4.38	1.591	3.28	0.500	1-1/2
286T	—	—	—	11.00	—	—	—	—	—	—	—	—	—
284TS	—	—	—	9.50	—	—	1.625	3.25	3.00	1.416	1.91	0.375	1-1/2
286TS	—	—	—	11.00	—	—	—	—	—	—	—	—	—
324U	16.00	8.00	6.25	10.50	5.25	0.66 hole	1.875	5.63	5.38	1.591	4.28	0.500	1-1/2
326U	—	—	—	12.00	—	—	—	—	—	—	—	—	—
324US	—	—	—	10.50	—	—	1.625	3.25	3.00	1.416	1.91	0.375	—
326US	—	—	—	12.00	—	—	2.125	5.25	5.00	1.845	3.91	0.500	2
324T	—	—	—	10.50	—	—	—	—	—	—	—	—	—
326T	—	—	—	12.00	—	—	1.875	3.75	3.50	1.591	2.03	—	—
324TS	—	—	—	10.50	—	—	—	—	—	—	—	—	—
326TS	—	—	—	12.00	—	—	2.125	6.38	6.13	1.845	5.03	0.500	2
364U	18.00	9.00	7.00	11.25	5.88	0.66 hole	2.125	6.38	6.13	1.845	5.03	0.500	2
366U	—	—	—	12.25	—	—	—	—	—	—	—	—	—
364US	—	—	—	11.25	—	—	1.875	3.75	3.50	1.591	2.03	—	—
366US	—	—	—	12.25	—	—	2.375	5.88	5.62	2.021	4.28	0.625	3
364T	—	—	—	11.25	—	—	—	—	—	—	—	—	—
366T	—	—	—	12.25	—	—	1.875	3.75	3.50	1.591	2.03	0.500	—
364TS	—	—	—	11.25	—	—	—	—	—	—	—	—	—
366TS	—	—	—	12.25	—	—	2.375	7.13	6.88	2.021	5.53	0.625	2
404U	20.00	10.00	8.00	12.25	6.62	0.81 hole	2.375	7.13	6.88	2.021	5.53	0.625	2
406U	—	—	—	13.75	—	—	—	—	—	—	—	—	—
404US	—	—	—	12.25	—	—	2.125	4.25	4.00	1.845	2.78	0.500	—
406US	—	—	—	13.75	—	—	2.875	7.25	7.00	2.450	5.65	0.750	3
404T	—	—	—	12.25	—	—	—	—	—	—	—	—	—
406T	—	—	—	13.75	—	—	2.125	4.25	4.00	1.845	2.78	0.500	—
404TS	—	—	—	12.25	—	—	—	—	—	—	—	—	—
406TS	—	—	—	13.75	—	—	2.875	8.50	8.25	2.880	6.91	0.875	3
444U	22.00	11.00	9.00	14.50	7.50	0.81 hole	2.875	8.63	8.38	2.450	7.03	0.750	2-1/2
446U	—	—	—	16.50	—	—	—	—	—	—	—	—	—
444US	—	—	—	14.50	—	—	2.125	4.25	4.00	1.845	2.78	0.500	—
446US	—	—	—	16.50	—	—	3.375	8.50	8.25	2.880	6.91	0.875	3
444T	—	—	—	14.50	—	—	—	—	—	—	—	—	—
446T	—	—	—	16.50	—	—	2.875	4.75	4.50	2.021	3.03	0.625	—
447T	—	—	—	20.00	—	—	—	—	—	—	—	—	—
449T	—	—	—	25.00	—	—	—	—	—	—	—	—	—
444TS	—	—	—	14.50	—	—	2.375	4.75	4.50	2.021	3.03	0.625	—
446TS	—	—	—	16.50	—	—	—	—	—	—	—	—	—
447TS	—	—	—	20.00	—	—	—	—	—	—	—	—	—
449TS	—	—	—	25.00	—	—	—	—	—	—	—	—	—
5004	25.00	12.50	10.00	16.00	8.50	0.94 hole	3.875	11.63	11.25	3.309	10.00	1.000	—
5004G	—	—	—	—	—	—	3.500	10.50	10.19	3.007	9.00	0.875	—
5004S	—	—	—	—	—	—	2.875	5.75	5.50	2.450	4.13	0.750	—
5004SS	—	—	—	—	—	—	2.375	4.75	4.50	2.021	3.13	0.625	—
5006L	28.50	—	—	20.00	—	—	4.875	14.63	14.38	4.168	12.88	1.250	—
5006S	—	—	—	—	—	—	2.875	5.75	5.50	2.450	4.00	0.750	—
5006MS	—	—	—	—	—	—	3.375	6.75	6.50	2.880	5.00	0.875	—
5008	25.00	—	—	25.00	—	—	3.875	11.63	11.25	3.309	10.00	1.000	—
5008G	—	—	—	—	—	—	3.500	10.50	10.19	3.007	9.00	0.875	—
5008L	28.50	—	—	—	—	—	4.875	14.63	14.38	4.168	12.88	1.250	—
5008S	25.00 ¹	—	—	—	—	—	2.875	5.75	5.50	2.450	4.13 ¹	0.750	—
5008MS	28.50	—	—	—	—	—	—	—	—	—	4.00 ²	—	—
5008SS	25.00 ¹	—	—	—	—	—	3.375	6.75	6.50	2.880	5.00	0.875	—
5010L	28.50	—	—	32.00	—	—	2.375	4.75	4.50	2.021	3.13 ¹	0.625	—
5010S	—	—	—	—	—	—	—	—	—	—	3.00 ²	—	—
5010MS	—	—	—	—	—	—	4.875	14.63	14.38	4.168	12.88	1.250	—
5010SS	—	—	—	—	—	—	2.875	4.75	4.50	2.021	3.00	0.625	—
5012L	—	—	—	40.00	—	—	4.875	14.63	14.38	4.168	12.88	1.250	—
5012S	—	—	—	—	—	—	2.875	5.75	5.50	2.450	4.00	0.750	—
5012MS	—	—	—	—	—	—	3.375	6.75	6.50	2.880	5.00	0.875	—
5012SS	—	—	—	—	—	—	2.375	4.75	4.50	2.021	3.00	0.625	—



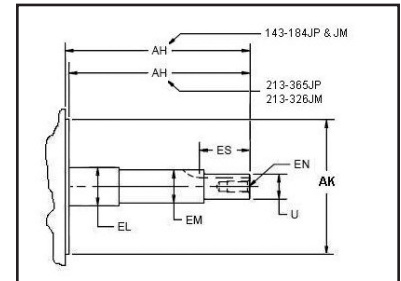
1. Totally Enclosed Motors 2. Open Drip Proof Motors † All marks shown within this document are properties of their other respective owners.

† All marks shown within this document are properties of their respective owners.

NEMA^{®†} Dimension Guide

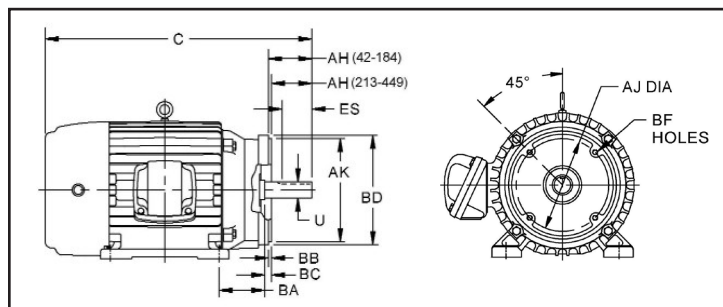
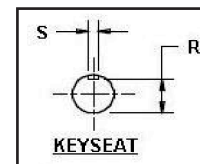
JP Shaft

Frame	AH	U	EM	EL	EN	AK	R	Keyseat ES Min.	S
143	7.313	0.8745	1.0000	1.156	3/8-16 x .75	4.500	0.771	1.65	0.188
145									
182	7.313	0.8745	1.0000	1.250	3/8-16 x .75	4.500	0.771	1.65	0.188
184									
213	8.125	1.2495	1.3750	1.750	3/8-16 x .75	8.500	1.112	1.65	0.250
215									
254	8.125	1.2495	1.3750	1.750	1/2-13 x 1.00	8.500	1.112	2.53	0.250
256									
284	8.125	1.2495	1.3750	1.750	1/2-13 x 1.00	12.500	1.112	2.53	0.250
286									
324	8.125	1.2495	1.3750	1.750	1/2-13 x 1.00	12.500	1.112	2.53	0.250
326									
364	8.125	1.6245	1.7500	2.125	1/2-13 x 1.00	12.500	1.416	2.53	0.375
365									



JM Shaft

Frame	AH	U	EM	EL	EN	AK	R	Keyseat ES Min.	S
143	4.250	0.8745	1.0000	1.156	3/8-16 x .75	4.500	0.771	1.65	0.188
145									
182	4.250	0.8745	1.0000	1.250	3/8-16 x .75	4.500	0.771	1.65	0.188
184									
213	4.250	0.8745	1.0000	1.250	3/8-16 x .75	8.500	0.771	1.65	0.188
215									
254	5.250	1.2495	1.3750	1.750	1/2-13 x 1.00	8.500	1.112	2.53	0.250
256									
284	5.250	1.2495	1.3750	1.750	1/2-13 x 1.00	12.500	1.112	2.53	0.250
286									
324	5.250	1.2495	1.3750	1.750	1/2-13 x 1.00	12.500	1.112	2.53	0.250
326									



**Dimensions for
Type C-Face AC Motors,
Footed or Footless**

Frame	AJ	AK	BA	BB Min.	BC	BD Max.	BF Hole Number	Tap Size	Bolt Penetration Allowance	U	AH	R	Keyseat ES Min.	S
42C	3.750	3.000	2.062	0.16	-0.19	5.00	4	1/4-20	—	0.375	1.312	0.328	—	flat
48C	3.750	3.000	2.50	0.16	-0.19	5.625	4	1/4-20	—	0.500	1.69	0.453	—	flat
56C	5.875	4.500	2.75	0.16	-0.19	6.50	4	3/8-16	—	0.625	2.06	0.515	1.41	0.188
143TC & 145TC	5.875	4.500	2.75	0.16	+0.12	6.50	4	3/8-16	0.56	0.875	2.12	0.771	1.41	0.188
182TC & 184TC	7.250	8.500	3.50	0.25	+0.12	9.00	4	1/2-13	0.75	1.125	2.62	0.986	1.78	0.250
182TCH & 184TCH	5.875	4.500	3.50	0.16	+0.12	6.50	4	3/8-16	0.56	1.125	2.62	0.986	1.78	0.250
213TC & 215TC	7.250	8.500	4.25	0.25	+0.25	9.00	4	1/2-13	0.75	1.375	3.12	1.201	2.41	0.312
254TC & 256TC	7.250	8.500	4.75	0.25	+0.25	10.00	4	1/2-13	0.75	1.625	3.75	1.416	2.91	0.375
284TC & 286TC	9.000	10.500	4.75	0.25	+0.25	11.25	4	1/2-13	0.75	1.875	4.38	1.591	3.28	0.500
284TSC & 286TSC	9.000	10.500	4.75	0.25	+0.25	11.25	4	1/2-13	0.75	1.625	3.00	1.416	1.91	0.375
324TC & 326TC	11.000	12.500	5.25	0.25	+0.25	14.00	4	5/8-11	0.94	2.125	5.00	1.845	3.91	0.500
324TSC & 326TSC	11.000	12.500	5.25	0.25	+0.25	14.00	4	5/8-11	0.94	1.875	3.50	1.591	2.03	0.500
364TC & 365TC	11.000	12.500	5.88	0.25	+0.25	14.00	4	5/8-11	0.94	2.375	5.62	2.021	4.28	0.625
364TSC & 365TSC	11.000	12.500	5.88	0.25	+0.25	14.00	8	5/8-11	0.94	1.875	3.50	1.591	2.03	0.500
404TC & 405TC	11.000	12.500	6.62	0.25	+0.25	15.50	8	5/8-11	0.94	2.875	7.00	2.450	5.65	0.750
404TSC & 405TSC	11.000	12.500	6.62	0.25	+0.25	15.50	8	5/8-11	0.94	2.125	4.00	1.845	2.78	0.500
444TC & 445TC	14.000	16.000	7.50	0.25	+0.25	18.00	8	5/8-11	0.94	3.375	8.25	2.880	6.91	0.875
444TSC & 445TSC	14.000	16.000	7.50	0.25	+0.25	18.00	8	5/8-11	0.94	2.375	4.50	2.021	3.03	0.625
447TC & 449TC	14.000	16.000	7.50	0.25	+0.25	18.00	8	5/8-11	0.94	3.375	8.25	2.880	6.91	0.875
447TSC & 449TSC	14.000	16.000	7.50	0.25	+0.25	18.00	8	5/8-11	0.94	2.375	4.50	2.021	3.03	0.625
5000 Frame Series	14.500	16.500	—	0.25	+0.25	18.00	4	5/8-11	0.94	—	—	—	—	—

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